WPS AND PQR	Vendor Document No: LNH3-HEI-WPS-QC-003	
	Rev. No. 0	Page 1 of 101

OWNER : **TORISHIMA PUMP MFG. CO.,LTD**
PROJECT TITLE : **AMMONIA TESTING FACILITY**
PO NO : **3100099788 & 3100099789**
VENDOR : **PT. HANAZONO ENGINEERING INDONESIA**
LOCATION : **TORISHIMA PUMP MFG. CO.,LTD - OSAKA - JAPAN**

FOR APPROVAL

☐	A	Approved
☐	B	Approved with notes
☐	C	Commented
☐	D	Not approved or rejected
Return date :		
Approved by :		
Received date :		

0	February 08, 2024	For Approval	BENRIDHO	RUSNANDI	MURASATO	CLIENT
REV	**DATE ISSUED**	**ISSUE PURPOSE**	**PREPARED**	**CHECKED**	**APPROVED**	**AUTHOLIZED**

Revision History

Revision No.	Date	Description of Revision
0	February 08, 2024	For Approval

PT. HANAZONO Engineering Indonesia We are always partner with you	**WPS & PQR LIST**	Doc. No.	QC-WPS-HEI-24-01
		Date	February 08, 2024
		Rev. No.	**2**

No.	WPS No.	PQR No.	P No. To P No.		Weld Process	Qualification Record						Range Qualification Procedure						Remarks
						T (mm)	t (mm)	F No.	A No.	SFA No.	AWS Class.	T (mm)	t (mm)	F No.	A No.	SFA No.	AWS Class.	
1	001/HEI/WPS/MIGAS/21	001/HEI/PQR/MIGAS/21	1	1	GTAW	8.41	3	6	1	5.18	ER70S-6	1.5 ~ 16.82	6	6	1	5.18	All classifications	
					SMAW		5.41	4	1	5.1	E7018-1H4R		10.82	4	1	5.1	EXX15/16/18/18M/48	
2	002/HEI/WPS/MIGAS/20	002/HEI/PQR/MIGAS/20	8	1	GTAW	9.76	3	6	8	5.9	ER309L	1.5 ~ 19.52	6	6	8	5.9	All classifications	
					SMAW		6.76	5	8	5.4	E309L		13.52	5	8	SFA-5.4 austenitic and duplex	EXXX(X)-15/16/17	
3	006/HEI/WPS/MIGAS/20	006/HEI/PQR/MIGAS/20	1	1	GTAW	9.645	3	6	1	5.18	ER70S-6	1.5 ~ 19.29	6	6	1	5.18	All classifications	
					SMAW		6.645	4	1	5.1	E7018		13.29	4	1	5.1	EXX15/16/18/18M/48	
4	003/HEI/WPS/MIGAS/20	003/HEI/PQR/MIGAS/20	8	8	GTAW	9.82	3	6	8	5.9	ER316L	1.5 ~ 19.64	6	6	8	5.9	All classifications	
					SMAW		6.82	5	8	5.4	E316L		13.64	5	8	5.4	EXX15/16/18/18M/48	
5	005/HEI/WPS/MIGAS/20	005/HEI/PQR/MIGAS/20	1	1	GTAW	9.73	3	6	1	5.18	ER70S-6	1.5 ~ 19.46	6	6	1	5.18	All classifications	
					SMAW		6.73	4	1	5.1	E7018-1H4R		13.46	4	1	5.1	EXX15/16/18/18M/48	
6	009/HEI/WPS/MIGAS/21	009/HEI/PQR/MIGAS/21	8	8	SMAW	30	30	5	8	5.4	E308L-16	5 ~ 60	60	5	8	5.4	EXX15/16/18/18M/48	
7	012/HEI/WPS/MIGAS/21	012/HEI/PQR/MIGAS/21	8	8	GTAW	8.74	8.74	6	8	5.9	ER308L	1.5 ~ 17.48	17.48	6	8	5.9	All classifications	

Prepared By	Reviewed By	Approved By
Benridho	Mulyanto	Rusnandi

PT. HANAZONO Engineering Indonesia
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Office & Work Shop Address: Jl. Raya Bojonegara - Serdang RT/RW. 001/001 No.44
Desa Kertasana, Kec. Bojonegara, Kab. Serang, Banten - Indonesia 42454
Phone : +62-254-7850344/5/6, Fax : +62-254-785037

WELDING PROCEDURE SPECIFICATION (WPS)

In accordance with
Section IX, ASME Boiler and Pressure Vessel Code

Organization Name: PT. HANAZONO ENGINEERING INDONESIA — By: Quality Department
Welding Procedure Specification No.: 001/HEI/MIGAS/21 — Date: 17/01/2021 — Supporting PQR No.(s): 001/HEI/MIGAS/21
Revision No.: 0 — Date: 11/01/2021

Welding Process (es): GTAW & SMAW — Type (s): Manual
(Automatic, Manual, Machine or Semi-Auto)

JOINT (QW - 402) — **Details**

Joint Design: Single Vee or Any
Root Spacing: 0 ~ 3 mm
Backing: With / Without
Backing Material (Type): Air (GTAW) / Base Nor Weld Metal (GTAW / SMAW)

See Joint Details

Sketches, production Drawings, Weld Symbols or Written Description Should show the general arrangement of the parts to be welded. Where applicable, the root spacing and the details of weld groove maybe specified.

Sketches may be attached to illustrate joint design, weld layers, and bead sequence (e.g., for toughness procedures, for multiple process procedures, etc.)

***BASE METALS (QW - 403)**

P. No. - Group No. - to P. No. - Group No. -

OR

Specification type, grade, or UNS: SS400
to Specification type, grade, or UNS: SS400

OR

Chem. Analysis and Mech. Prop: -
to Chem. Analysis and Mech. Prop: -
Thickness Range :
Base Metal : Groove: 1.5 ~ 16.82 mm — Fillet: All
Maximum Pass Thickness ≤½ in. (13mm) (Yes): All — (No): -
Other:

***FILLER METALS (QW - 404)**

	1 GTAW	2 SMAW
Spec. No. (SFA)	5.18	5.1
AWS No. (Class)	ER70S-6	E7018-1H4R
F - No.	6	4
A - No.	1	1
Size of Filler Metals	Ø 1.6 mm ~ 2.4 mm	Ø 3.2 ~ 4.0 mm
Weld Metal		
Deposit Thickness:		
Groove	Max. 6 mm	Max. 10.82 mm
Fillet	All	All
Electrode Flux (Class)	N/A	N/A
Flux Type	N/A	Low Hydrogen
Flux Trade Name	N/A	N/A
Consumable Insert	N/A	N/A
Other	Manufacturer : BOHLER	
	Electrode Name : **Bohler S EMK 6 & Fox S EV 50-1**	

*Each base metal-filler metal combination should be specified individually.

Nomor Registrasi Migas
AYG - 07981 / 0248 / 2021

WELDING INSPECTOR IM MIGAS

PT. HANAZONO Engineering Indonesia
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Phone : +62-254-7850344/5/6, Fax : +62-254-785037

WELDING PROCEDURE SPECIFICATION (WPS)

In accordance with
Section IX, ASME Boiler and Pressure Vessel Code

Welding Procedure Specification No. : 001/HEI/MIGAS/21 Rev. 0

POISITIONS (QW- 405)

Position(s) of Grove: All
Welding Progression: All
Position(s) of Fillet: All

POSTWELD HEAT TREATMENT (QW - 407)

Temperature Range: N / A
Time Range: N / A

PREHEAT (QW - 406)

Preheat Temp. Min.: 33 °C
Interpass Temp. Max.: 250 °C
Preheat Maintenance: N/A *)
Other:

(Continuous or special heating, where applicable, should be specified)

GAS (QW - 408)

	Persent Composition		
	Gas (es)	Mixture	Flow Rate
Shielding	Argon	99,99%	7 - 15 LPM
Trailing	-	-	-
Backing	-	-	-
Other	-	-	-

ELECTRICAL CHARACTERISTIC (QW - 409)

Weld Pass(es)	Process	Filler Metal		Current Type & Polarity	Amps. (Range)	Wire Feed Speed (Range)	Energy or Power (Range)	Volts (Range)	Travel Speed (Range)	Other (e.g., Remarks, Comments, Hot Wire Addition, Technique, Process Torch Angle, etc.)
		Class	Dia.							
Root & Hot	GTAW	ER70S-6	1.6 ~ 2.4	DCEN	50 - 150	-	-	9 - 18	11 - 65	-
Fill & Capping	SMAW	E7018-1H4R	3.2 ~ 4.0	DCEP	80 - 190	-	-	19 - 28	38 - 140	-

Amps and volts, or power or energy range, should be specified for each electrode size, position, and thickness, etc.

Pulsing Current: N/A Heat Input (max.): 2.5J
Tungsten Electrode Size and Type: 1.6 ~ 2.4mm & 2% Thoriated (EWTh-2)
(Pure Tungsten, 2% Thoriated, etc.)
Mode of Metal Transfer for GMAW (FCAW): N/A
(Spray Arc, Short-Circuiting Arc, etc.)
Other: N/A

TECHNIQUE (QW - 410)

String or Weave Bead: Max. stringer or weaver within 2.5 time diameter of electrodes
Orifice, Nozzle, or Gas Cup Size: 5, 6, or 7
Initial and Interpass Cleaning (Brushing, Grinding, etc.): Brushing & Grinding
Method of Back Gouging: Back Grinding / Back Gouging
Oscillation: N/A
Contact Tube to Work Distance: 12 ~ 19 mm (GTAW)
Multiple or Single Pass (Per Side): Multiple
Multiple or Single electrode: Single
Electrode Spacing: N/A
Peening: N/A
Other: Welds shall be cleaned between each pass. When completed, remove all slag & projection with grinding & Brushing

Nomor Registrasi Migas
AYG - 07981 / 0248 / 2021
WELDING INSPECTOR IM MIGAS

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WELDING PROCEDURE SPECIFICATION (WPS)

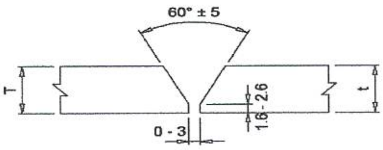
In accordance with
Section IX, ASME Boiler and Pressure Vessel Code

Welding Procedure Specification No. : 001/HEI/MIGAS/21 Rev. 0

JOINT DETAILS

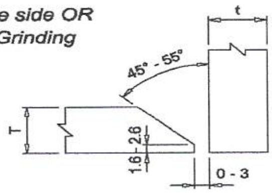
SINGLE VEE GROOVE
T = t

Welded from one side



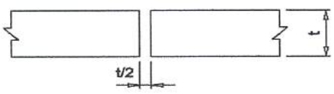
SINGLE BEVEL - CORNER JOINT
T = t

Welded from one side OR both side Back Grinding



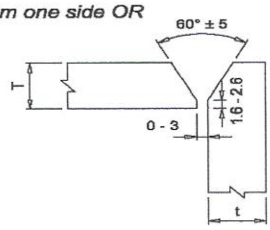
SQUARE BUTT

***Welded from BOTH SIDES, T = 6 mm* Max**
Root gap, 0 - t/2



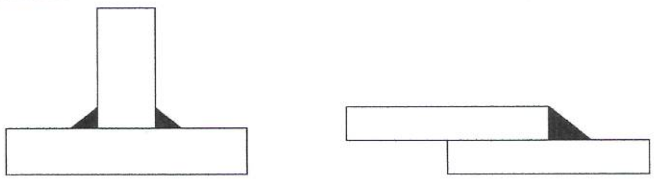
SINGLE VEE GROOVE
T = t

Welded from one side OR both side



SINGLE OR DOUBLE FILLET

UNLIMITED



For Non-Impact tested applications only, the following AWS/SFA clasification can be used with this procedure :
GTAW : ER70S-6 / 5.18 & SMAW : E7018-1H4R / 5.1

Weld Joint description shown are not inclusive of all of those found on job site. Weld joint design reference in an engineering specification or design shall take precedence over weld joint shown in this WPS.

Organization Prepared by,	Verified by
PT. HANAZONO ENG. INDONESIA	**MINISTRY OF ENERGY AND MINERAL RESOURCES**
	DIRJEN MIGAS
PT. HANAZONO ENGINEERING INDONESIA QC DEPARTMENT	Nomor Registrasi Migas AYG - 07981/0248/2021 — WELDING INSPECTOR IM
Date : January 17, 2021	*Date : January 17, 2021*

PT. HANAZONO Engineering Indonesia
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PROCEDURE QUALIFICATION RECORD (PQR)

Record Actual Conditions Used to Weld Test Coupon

Organization Name **PT. HANAZONO ENGINEERING INDONESIA**

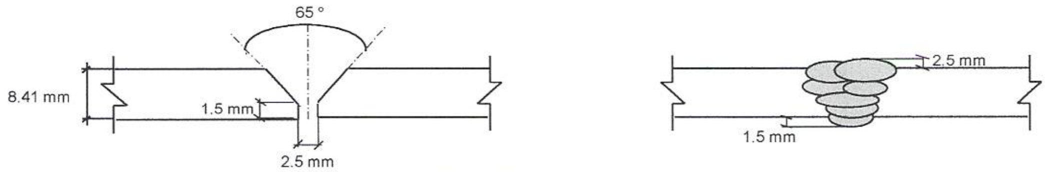
Procedure Qualification Record No. 001/HEI/MIGAS/21 Date 11/01/2021

WPS No. 001/HEI/MIGAS/21

Welding Process (es) GTAW & SMAW

Types (Manual, Automatic, Semi-Automatic Manual

JOINTS (QW - 402)



Groove Design of Test Coupon

(For combination qualifications, the deposited weld metal thickness shall be recorded for each filler metal and process used.)

BASE METAL (QW - 403)

Material Spec. SS400 to SS400

Type or Grade, or UNS Number -

P-No. - Group No. - to P-No. - Group No. -

Thickness of Test Coupon 8.41 mm

Diameter of Test Coupon N/A

Maximum Pass Thickness ≤½ in. (13mm)

Other

FILLER METAL (QW - 404)

SFA Specification	5.18	5.1
AWS Specification	ER70S-6	E7018-1H4R
Filler Metal F-No.	6	4
Weld Metal Analysis A-No.	1	1
Size of Filler Metal	Ø2.4 mm	Ø3.2 mm
Filler Metal Product Form	Solid Bare	Flux Coated
Supplemental Filler Metal	N/A	N/A
Electrode Flux Classification	N/A	N/A
Flux Type	N/A	Low Hydrogen
Flux Trade Name	N/A	N/A
Weld Metal Thickness	3 mm	5.41 mm
Other	BOHLER S EMK 6	FOX S EV 50-1

POSITION (QW - 405)

Position(s) of Groove 3G

Weld Progression (Uphill, Downhill) Uphill

Other N/A

PREHEAT (QW - 406)

Preheat Temperature 33°C

Interpass Temperature 250°C

Other N/A

POSTWELD HEAT TREATMENT (QW - 407)

Temperature Range N/A

Time N/A

Others N/A

GAS (QW - 408)

	Persent Composition		
	Gas (es)	Mixture	Flow Rate
Shielding	Argon	99,98%	13 LPM
Trailing	-	-	-
Backing	-	-	-

ELECTRICAL CHARACTERISTIC (QW - 409)

Current DCEN (GTAW) & DCEP (SMAW)

Polarity *See Table Welding Parameter*

Amps *See Table Welding Parameter*

Waveform Control N/A

Power or Energy *See Table Welding Parameter*

Arc Time 5 - 10 Minutes / Pass

Weld Bead Length 4 mm (GTAW) & 5 mm (SMAW)

Tungsten Electrode Size 2.4mm & 2% Thoriated (EWTh-2)

Mode of Metal Transfer for GMAW (FCAW) N/A

Heat Input *See Table Welding Parameter*

Other N/A

TECHINQUE (QW - 410)

Travel Speed *See Table Welding Parameter*

String or Weave Bead String & Weave Bead

Oscillation N/A

Multipass or Single Pass (Per Side) Single & Multipass

Single or Multiple Electrodes Single

Other N/A

Nomor Registrasi Migas

AYG - 07901 / 0248 / 2021

WELDING INSPECTOR IM

PT. HANAZONO Engineering Indonesia
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PROCEDURE QUALIFICATION RECORD (PQR)

Record Actual Conditions Used to Weld Test Coupon

Procedure Qualification Record No. : 001/HEI/MIGAS/21 Rev. 0

WELDING PARAMETER

Weld No.	Welding Process	Filer Metal		Type Polarity	Ampere	Volt	Travel Speed Range (mm/min)	Heat Input (J/mm)
		Class	Dia.					
1	GTAW	ER70S-6	2.4 mm	DCEN	92	9	27	1,8
2					95	10	30	1,9
3	SMAW	E7018-1H4R	3.2 mm	DCEP	88	20	47	2,2
4					95	20	53	2,2
5					95	20	52	2,2
6					85	19	50	1,9
7					85	19	55	1,8

TENSILE TEST (QW - 160)

Specimen No.	Width (mm)	Thickness (mm)	Area (mm^2)	Ultimate Total Load (kN)	Ultimate Unit Stress (N/mm^2)	Type Failure & Location
T1	19,13	8,41	160,88	81,73	508	Fracture on base metal
T2	19,13	8,42	161,07	81,50	506	Fracture on base metal

GUIDE BEND TESTS (QW - 160)

Type and Figure No.	Result
SB1 - QW 462.2	**No Open Discontinuity**
SB2 - QW 462.2	**No Open Discontinuity**
SB3 - QW 462.2	**No Open Discontinuity**
SB4 - QW 462.2	**0.96 mm Opening Discontinuity**

TOUGHNESS TESTS (QW - 170)

Specimen No.	Notch Location	Specimen Size	Test Temp. (°C)	Toughness Values		Drop Weight Break (Y/N)
				% Shear	Mils (in.) or mm	
--Blank--						

Comments

Nomor Registrasi Migas
AYG - 07981/0248/2021
WELDING INSPECTOR IM

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PROCEDURE QUALIFICATION RECORD (PQR)

Record Actual Conditions Used to Weld Test Coupon

Procedure Qualification Record No. : 001/HEI/MIGAS/21 Rev. 0

FILLET-WELD TEST (QW - 180)

Result - Satisfactory : Yes - No - Penetration into Parent Metal : Yes - No -

Macro - Result None

HARDNESS TESTS

Test No	Test Location	Vickers Hardness Value HV 10, Kgf/mm^2			Remarks
		12^{oo}			
		Line 1	Line 2	Line 3	
---Blank---					

Other Tests

Type of Test None

Deposit Analysis None

Other Radiography examination, Result : ACC, Report No. : **001/RT/PQR/HEI/XII/20** by PT. Rire Sanjaya Sakti

Welder's Name **ASMURI** Clock No. - Stamp No. **AM1703**

Tests conducted by : **PT. Bintang Inspeksindo Indonesia** Laboratory Test No. : **BII/TR/0121/013**

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 Boiler and Pressure Vessel Code.

Organization Prepared by,	Verified by
PT. HANAZONO ENG. INDONESIA	**MINISTRY OF ENERGY AND MINERAL RESOURCES**
	DIRJEN MIGAS
PT. HANAZONO ENGINEERING INDONESIA QC DEPARTMENT	Nomor Registrasi Migas AYG - 07981/0248/2021
	WELDING INSPECTOR IM
Date : January 12, 2021	*Date : January 12, 2021*

KRAKATAU POSCO

Mill Test Certificate

Certificate No. : 171031-FPQ8IN-0029A1-0001
Date of Issue : Nov., 03, 2020

Order No. : Q8S1009462
Supplier : -
Customer : -

PO No. : 401/SKM-YT/10/20
Commodity : PLATE
Spec & Type : JIS G3101 SS400

Size	Product No.	Quantity	Weight (kg)	Heat No.	Position	Tensile Test YP (MPa)	TS	EL (%)	Division	Chemical Composition C (%)	Si (%)	Mn (%)	P (%)	S (%)
9x1524x13500	PK33331603-1604	2	1,938	SK33487	T	325	450	29	L	0.1289	0.236	0.648	0.0123	0.0016
9x1524x13500	PK33331702-1704	3	2,907	SK33487	T	325	450	29	L	0.1289	0.236	0.648	0.0123	0.0016
9x1524x13500	PK33331801-1804	4	3,876	SK33487	T	326	450	29	L	0.1289	0.236	0.648	0.0123	0.0016
9x1524x13500	PK33331901-1904	4	3,876	SK33487	T	325	450	29	L	0.1289	0.236	0.648	0.0123	0.0016
*** Sub Total (010) ***		13	12,597 (kg)											

* Position - T : Top, M : Middle, B : Bottom
* Tensile Test, Direction . Transversal, Gauge Length 200mm(Rectangular),
  YP Method : Upper Point
* Division - L : Ladle Analysis
* Supply Condition : As-Rolled unless otherwise Heat Treated.

We hereby certify that the material herein has been made in accordance with the order and above specification.
This material has been fully killed and made by basic oxygen process. This material is fine grained steel.
Test Certificate is issued according to EN10204 3.1.

Legal sanction can be imposed on forging. Improper use of product can cause safety issues.

Surveyor To :

NA SEON-HA

Testing and Inspection Team Leader NA SEON-HA

PT. voestalpine Böhler Welding Asia Pacific

voestalpine Böhler Welding Asia Pacific
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17530 Bekasi
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www.voestalpine.com/welding

PT ALLALLOY CAHAYA DYNAWELD
JL. PANTAI INDAH SELATAN KOMP.
KAMAL MUARA, PENJARINGAN
14470 Jakarta Utara
Indonesia

Inspection certificate 3.1

as per : EN 10204
No. : 2020-2047011831-30-20098-025
Rev. 0

PO no.	ACD/JK-N/20/04/0464	of	27.04.2020
Order no.	1042004411		
Delivery note/pos./splitt	2047011831/000000/000030	of	08.07.2020

Product	GTAW rod/wire
Trade name	**BOHLER S EMK 6**
Standard designation	EN ISO 636-A : W 42 5 3Si1
	AWS A5.18/SFA 5.18 : ER70S-6

Dimension	2,4 x 1000mm	118955
Lot no.	20098	86356
Quantity	2500,0 KG	JU10B00W
		0425

Chemical composition in % of the product

C	Si	Mn	P	S	Cr	Mo	Ni	V	Cu					
0,06	0,87	1,51	0,017	0,012	< 0,01	< 0,01	< 0,01		0,02					

Mechanical properties **ASME II/Sched.F**

Tensile test according to : ASTM E8
Specimen preparation according to : AWS B4.0

T	ReL / Rp 0,2 MPa	Rp 1,0 MPa	Rm MPa	A (Lo = 4d) %	Z %	WBH PWHT	Remarks
25°C	≥ 420		≥ 500	≥ 25		AW	Typical values

Impact test according to : ASTM E23
Specimen preparation according to : AWS B4.0

T	Impact energy KV / J	Average KV / J	Lateral expansion mm	Shear fracture %	WBH PWHT	Remarks
-50°C		≥ 47			AW	Typical values

The product BOHLER S EMK 6 meets the requirements of the filler metal specification ASME sec II, part C, AWS A5.18/SFA 5.18 : ER70S-6 when tested in accordance with that specification.

Complying the corrosion testing requirements as per NACE MR 0175 standard TM 01-77-96 (SSC) and 02-84-96 (HIC).

Town	Date		Authorized representative
Bekasi	13.07.2020	This certificate was issued by DP-equipment and does not require signature.	Miftah Farid

voestalpine
ONE STEP AHEAD.

PT. voestalpine Böhler Welding Asia Pacific

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14470 Jakarta Utara
Indonesia

Inspection certificate 3.1

as per : EN 10204
No. : 2020-2047011900-30-20607-025
Rev. 0

PO no.	ACD/BS-N/20/07/0624	of	13.07.2020
Order no.	1042004566		
Delivery note/pos./splitt	2047011900/000000/000030	of	20.07.2020

Product	covered electrode
Trade name	**BOHLER FOX S EV 50-1 VP**
Standard designation	ISO 2560-B : E 49 18-1 A U H 5
	ISO 2560-A : E 42 5 B 42 H5
	AWS A5.1/SFA 5.1 : E7018-1H4R

Dimension	SMAW 3,25 x 350 mm	118955
Lot no.	20607	46917 JUPB010E
Quantity	3312,0 KG	0425

Chemical composition in % of the weld metal

C	Si	Mn	P	S	Cr	Mo	Ni	V	Cu					
0,07	0,59	1,39	0,013	0,008	0,03	< 0,01	0,01	< 0,01	0,01					

Mechanical properties **ASME II/Sched.F**

Tensile test according to : ASTM E8
Specimen preparation according to : AWS B4.0

T	ReL / Rp 0,2 MPa	Rp 1,0 MPa	Rm MPa	A (Lo = 4d) %	Z %	WBH PWHT	Remarks
25°C	≥ 420		≥ 520	≥ 27		AW	Typical values

Impact test according to : ASTM E23
Specimen preparation according to : AWS B4.0

T	Impact energy KV / J	Average KV / J	Lateral expansion mm	Shear fracture %	WBH PWHT	Remarks
-50°C		≥ 70			AW	Typical values

The product BOHLER FOX S EV 50-1 VP meets the requirements of the filler metal specification ASME sec II, part C, AWS A5.1/SFA 5.1 : E7018-1H4R when tested in accordance with that specification.

Complying the corrosion testing requirements as per NACE MR 0175 standard TM 01-77-96 (SSC) and 02-84-96 (HIC).

Town	Date		Authorized representative
Bekasi	27.07.2020	This certificate was issued by DP-equipment and does not require signature.	Miftah Farid

voestalpine
ONE STEP AHEAD.

PT. ANUGRAH GASINDO ABADI
PRODUCER, TRADING & SERVICES INDUSTRIAL GASES
Link Pintu Air RT. 04/04. Kel. Semang Raya ,Kec. Citangkil. Kota Cilegon
Telp.: 0254 7840837, Email : ptag_srg@yahoo.co.id

CERTIFICATE OF ANALYSIS FOR GAS

Customer : PT. Hanazono Engineering Indonesia
Certificate No : 080/AGA/XI/2020
Date : 11 September 2020
No. S J : SJ022003300

Type Of Gas : **Argon UHP**
Capacity : 6 m³
Pressure : 150 Bar

Composition :
Argon : 99.999%
O2 : < 5.0 ppm
N2O : None
H2O : None

SPESIFIKASI :
Argon : > 99.999 %

DATA FISIK :
Simbol Kimia : Ar
Titik Didih : - 185.72° C
Berat Jenis Relatif (Udara = 1) : 1.4
Berat Jenis Molekul : 39.95
Suhu Kritis : - 122.4° C
Berat Jenis Gas (@101.3 kPa&15° C) : 1.78 kg / m³
Berat Jenis Cairan (B.Pt) : 1393 kg / cm³
Isi Spesifikasi (@ 101.3 kPa&15° C) : 9.708 ft³ / Lb
Titik Api : Tidak Terbakar

Cylinder No : 2 Cylinder

54296							
54378							

Quality Control
PT.Anugrah Gasindo Abadi

(Zulqarnain)

PT. RIRE SANJAYA SAKTI
Rope Access & NDT Services
Head Office : Jl. Wibawa Mukti II Kav.1-3 Jati Asih
Bekasi 17423 - Jawa Barat, Indonesia
Phone : +62-21 8243 5561 / 8241 5794
Fax : +62-21 8243 5168
Email : admin@rss.co.id, Website : www.rss.co.id

RADIOGRAPHY EXAMINATION REPORT

Client : PT. REKIND
Contractor : PT. HANAZONO ENGINEERING INDONESIA
Project : PQR

Job No. : -
Work Order / Request No. : -
Location : W/S PT. HBI-Bojonegara

Report No. : 001/RT/PQR/HBI/XII/20
Shooting Date : 30-12-2020
Date of Report : 31-12-2020

Radiographic Procedure : RSS/RT-ASME/003
Application Code : ASME VIII
Material Specification : SS 400 / SS 400, SS 400 / SA 36

Radiation Source : IR-192
F/S Source Size : 2.7 x 2.1 mm
Activity : 51 Ci
Exp. Time : 30 Min/Sec

Screen Type : LEAD
Back / Front Thick : 0.125 mm
Double ☐ Single Load ☑
Film type : AGFA D7

SFD : 381 mm / Inch
SSOF : 13 mm / Inch
SOD : 369 mm / Inch
Peny / IQI : ASTM 1B

RT Tech : DWSI ☐ DWDI ☐ SWSI ☑
IQI Type : S. Side ☑ F.Side ☐
Sensitivity : WL No.7 F. Density 2-4
Unsharp Geo : 0.09 mm

Identification	Joint No.	Material Size Thick	FILM SEQUENCE – Location Marker 4"X10"	4"X15"	7"X17"	Welder Stamp	Type of Discontinuity – Surface Indication	Crack	Incomplete Penetration	Incomplete Fusion	Slag Inclusion	Slag Lines	Concavity	Brun Though	Under Cut	Gas and Worm Hole	Porosity	Others	Sensitivity	Range Density	Judgement	Remarks
MIGAS TEST	PQR002/HBI/MIGAS/21	Thk 9 mm		A-B		W: AM 1703													7	2.8-3.2	ACC	26
	PQR001/HBI/MIGAS/21	Thk 9 mm		A-B		W: AM 1703													7	2.8-3.2	ACC	36

Technician:

Total Welds/Film Used : 2 Joints
[4" x 10"] : Sheets
[4" x 15"] : 2 Sheets
[7" x 17"] : Sheets

Comments :

Radiographer:
PT. RIRE SANJAYA SAKTI RADIOGRAPH TEST
NDE Level : II
Date 31-12-2020 TEGUH. P.

QA/QC Approved :
PT. HANAZONO ENGINEERING INDONESIA QC DEPARTMENT
Date : 04/01/21

Authorized Inspector:
Date :

Customer Rep. :
Date :

PT BINTANG INSPEKSINDO INDONESIA
Komplek Pergudangan EHA Blok B-02
Jl. Raya Legok Km 6 No.77, RT 002/001
Bojong Nangka, Kelapa Dua, Tangerang, Indonesia
Telp : 021 2222 7029
E-mail : marketing@bintanginspeksindo.com

ACM REGISTERED ISO 9001 : 2015 UKAS 245 Cert No : 1710861 Q
ilac-MRA
KAN KOMITE AKREDITASI NASIONAL Laboratorium Penguji LP-1186-IDN

Testing Report

Customer	:	**PT Hanazono Engineering Indonesia**	**Report Number**	:	BII/TR/0121/013
Address	:	Jl. Raya Bojonegara No. 44 Ds. Kertasana Kecamatan Bojonegara, Kabupaten Serang Banten - Indonesia 42454	**Total of Page**	:	1 of 2
			Date of Received	:	05 Januari 2021
			Date of Tested	:	11 Januari 2021
Tested for	:	Welding Procedure Spesification	**Project Name**	:	-
Test Method	:	ASME Sect IX: 2019	**PO Number**	:	PO-E2006-BII-TES-014
Reference Code	:	ASME Sect IX: 2019	**Sample Marking**	:	12.HEI1
Object to be tested	:	(as received)	**Unique Code**	:	J2TD3

Description : Carbon steel plate welded test sample, Size: 9 mm thickness, Material Spec: SS 400 to SS 400, PQR No: 001/HEI/MIGAS/21

Type of Test : **Reduced Section Tensile Test (Transversal)**
Testing Machine Used : COMPUTERIZED ELECTRO-HYDROLIC SERVO UNIVERSAL TESTING MACHINE
Model : WAW-1000E, Capacity : 1000 kN
Remarks : -

Environment Temp : $25 \pm 2^{0}C$

Specimen Number		**Tensile 1**	**Tensile 2**
Measured Thickness	**a_o (mm)**	8.41	8.42
Measured Width	**b_o (mm)**	19.13	19.13
Effective Area	**A_o (mm²)**	160.88	161.07
Ultimate Tensile Load	**F_m (kN)**	81.74	81.58
Ultimate Tensile Strength	**R_m (N/mm²)**	508	506
Location of Failure		Base Metal	Base Metal
Type of Failure		Ductile	Ductile

Note: *Hasil pengujian diatas hanya berlaku untuk sampel yang diuji*

Test Conducted By : Agnes Stephani
Checked By : Albertus Tonggak Onny Juniardi
Witnessed By : -

Date of Issued : 13 Januari 2021
Approved By

INSPEKSINDO INDONESIA

Albertus Tonggak Onny J.
Laboratory Manager

PT HANAZONO ENGINEERING INDONESIA

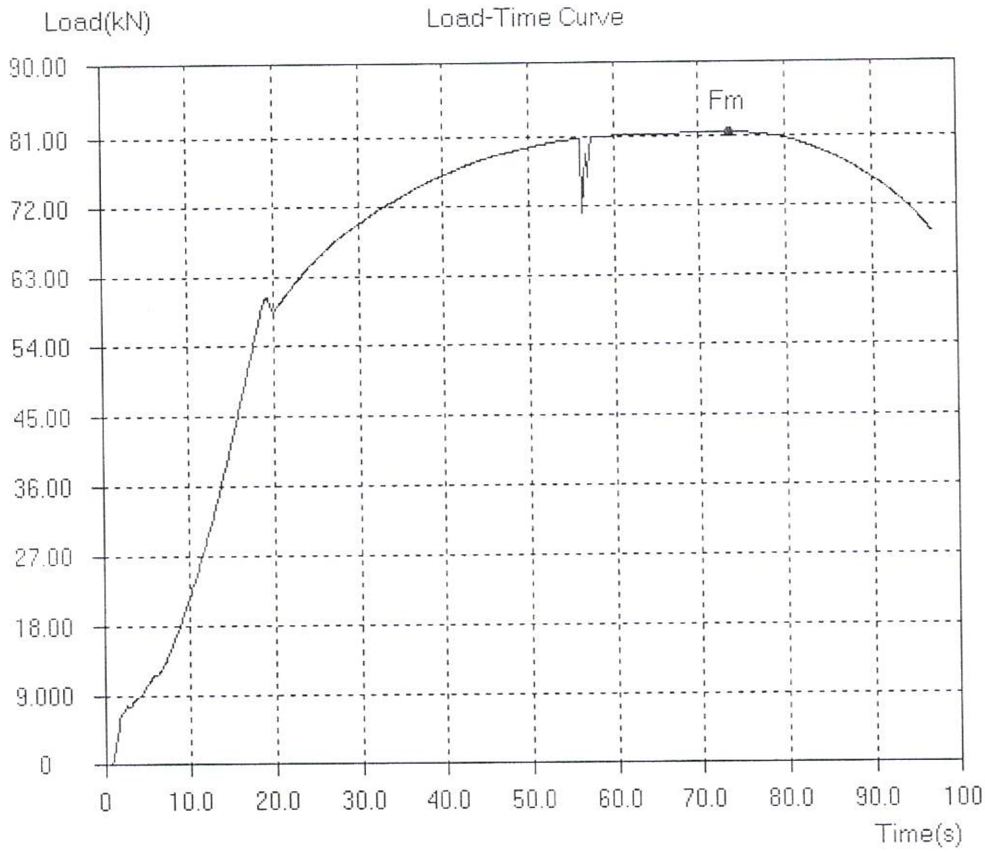
1.HEI1-T1

SampleID	21.1HEI1T1	TestDate	1/11/2021
Type	Flat	Size(mm)	8.41*19.13
Ao(mm²)	160.88	Fm(kN)	81.74
Rm(MPa)	508		

PT HANAZONO ENGINEERING INDONESIA

1.HEI1-T2

SampleID	21.1HEI1T2	TestDate	1/11/2021
Type	Flat	Size(mm)	8.42*19.13
Ao(mm²)	161.07	Fm(kN)	81.58
Rm(MPa)	506		



PT BINTANG INSPEKSINDO INDONESIA
Komplek Pergudangan EHA Blok B-02
Jl. Raya Legok Km 6 No.77, RT 002/001
Bojong Nangka, Kelapa Dua, Tangerang, Indonesia
Telp : 021 2222 7029
E-mail : marketing@bintanginspeksindo.com

Cert No : 1710861 Q

KAN Komite Akreditasi Nasional Laboratorium Penguji LP-1186-IDN

Testing Report

Customer	: PT Hanazono Engineering Indonesia	**Report Number**	: BII/TR/0121/013
Address	: Jl. Raya Bojonegara No. 44 Ds. Kertasana Kecamatan Bojonegara, Kabupaten Serang Banten - Indonesia 42454	**Total of Page**	: 2 of 2
		Date of Received	: 05 Januari 2021
		Date of Tested	: 11 Januari 2021
Tested for	: Welding Procedure Spesification	**Project Name**	: -
Test Method	: ASME Sect IX: 2019	**PO Number**	: PO-E2006-BII-TES-014
Reference Code	: ASME Sect IX: 2019	**Sample Marking**	: 12.HEI1
Object to be tested	: (as received)	**Unique Code**	: J2TD3

Description : Carbon steel plate welded test sample, Size: 9 mm thickness, Material Spec: SS 400 to SS 400, PQR No: 001/HEI/MIGAS/21

Type of Test : **Bending Test (Transverse Welding)**
Testing Machine Used : COMPUTERIZED ELECTRO-HYDRAULIC SERVO UNIVERSAL TESTING MACHINE
Model : WAW-1000E, Capacity : 1000 kN
Remarks : -

Environment Temp : 25 ± 2^{0}C

Test Weldment Thickness	: 9	mm		**Test Specimen Width**	: 38	mm
Former Diameter	: 40	mm		**Bend Angle**	: 180	degree
Shoulder Distance	: 58	mm				

Specimen No.	**Face Bend (1)**	**Face Bend (2)**	**Root Bend (1)**	**Root Bend (2)**
Observation	No opening was observed	No opening was observed	No opening was observed	0.96 mm opening was observed
Result	Accepted	Accepted	Accepted	Accepted

Note: *Hasil pengujian diatas hanya berlaku untuk sampel yang diuji*

Test Conducted By : Agnes Stephani
Checked By : Albertus Tonggak Onny Juniardi
Witnessed By : -

Date of Issued : 13 Januari 2021
Approved By

INSPEKSINDO INDONESIA

Albertus Tonggak Onny J.
Laboratory Manager

PT. HANAZONO Engineering Indonesia
We are always partner with you

Office & Work Shop Address: Jl. Raya Bojonegara - Serdang RT/RW. 001/001 No.44
Desa Kertasana, Kec. Bojonegara, Kab. Serang, Banten - Indonesia 42454
Phone : +62-254-7850344/5/6, Fax : +62-254-785037

WELDING PROCEDURE SPECIFICATION (WPS)

In accordance with
Section IX, ASME Boiler and Pressure Vessel Code

Organization Name: PT. HANAZONO ENGINEERING INDONESIA By: Quality Department
Welding Procedure Specification No.: 002/HEI/MIGAS/20 Date: 01/10/2020 Supporting PQR No.(s): 002/HEI/MIGAS/20
Revision No.: 0 Date: 01/10/2020

Welding Process (es): GTAW & SMAW Type (s): Manual
(Automatic, Manual, Machine or Semi-Auto)

JOINT (QW - 402) **Details**

Joint Design: Single Vee or Any
Root Spacing: 0 ~ 3 mm
Backing: With / Without
Backing Material (Type): Gas (GTAW) / Base Nor Weld Metal (GTAW / SMAW)

See Joint Details

Sketches, production Drawings, Weld Symbols or Written Description Should show the general arrangement of the parts to be welded. Where applicable, the root spacing and the details of weld groove maybe specified.

Sketches may be attached to illustrate joint design, weld layers, and bead sequence (e.g., for toughness procedures, for multiple process procedures, etc.)

***BASE METALS (QW - 403)**

P. No. 8 Group No. - to P. No. 1 Group No. -
OR
Specification type, grade, or UNS: -
to Specification type, grade, or UNS: -
OR
Chem. Analysis and Mech. Prop: -
to Chem. Analysis and Mech. Prop: -
Thickness Range :
Base Metal : Groove 1.5 ~ 19.52 mm Fillet All
Maximum Pass Thickness ≤½ in. (13mm) (Yes) All (No) -
Other

***FILLER METALS (QW - 404)**

	1	2
	GTAW	SMAW
Spec. No. (SFA)	5.9	5.4
AWS No. (Class)	ER309L	E309L-16
F - No.	6	5
A - No.	8	8
Size of Filler Metals	Ø 1.6 mm ~ 2.4 mm	Ø 3.2 ~ 4.0 mm
Weld Metal		
Deposit Thickness:		
Groove	Max. 6 mm	Max. 13.52 mm
Fillet	All	All
Electrode Flux (Class)	N/A	N/A
Flux Type	N/A	Lime Titania
Flux Trade Name	N/A	N/A
Consumable Insert	N/A	N/A
Other	Manufacturer : BOHLER / AVESTA	
	Electrode Name : **Bohler S CN 23/12-IG & Avesta 309L-16**	

*Each base metal-filler metal combination should be specified individually.

Nomor Registrasi Migas
AYG - 07981/0842/2020

WELDING INSPECTOR

PT. HANAZONO Engineering Indonesia
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Office & Work Shop Address: Jl. Raya Bojonegara - Serdang RT/RW. 001/001 No.44
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WELDING PROCEDURE SPECIFICATION (WPS)

In accordance with
Section IX, ASME Boiler and Pressure Vessel Code

Welding Procedure Specification No. : 002/HEI/MIGAS/20 Rev. 0

POISITIONS (QW- 405)

Position(s) of Grove	All
Welding Progression	All
Position(s) of Fillet	All

POSTWELD HEAT TREATMENT (QW - 407)

Temperature Range	N / A
Time Range	N / A

PREHEAT (QW - 406)

Preheat Temp. Min.	36 °C
Interpass Temp. Max.	150 °C
Preheat Maintenance	N/A *)
Other	

(Continuous or special heating, where applicable, should be specified)

GAS (QW - 408)

	Persent Composition		
	Gas (es)	Mixture	Flow Rate
Shielding	Argon	99,99%	7 - 15 LPM
Trailing	-	-	-
Backing	Argon	99,99%	7 - 15 LPM
Other	-	-	-

ELECTRICAL CHARACTERISTIC (QW - 409)

Weld Pass(es)	Process	Filler Metal		Current Type & Polarity	Amps. (Range)	Wire Feed Speed (Range)	Energy or Power (Range)	Volts (Range)	Travel Speed (Range)	Other (e.g., Remarks, Comments, Hot Wire Addition, Technique, Process Torch Angle, etc.)
		Class	Dia.							
Root & Hot	GTAW	ER309L	1.6 ~ 2.4	DCEN	80 - 160	-	-	10 - 18	24 - 88	-
Fill & Capping	SMAW	E309L-16	3.2 ~ 4.0	DCEP	60 - 160	-	-	18 - 28	32 - 135	-

Amps and volts, or power or energy range, should be specified for each electrode size, position, and thickness, etc.

Pulsing Current N/A Heat Input (max.) 2.0 J

Tungsten Electrode Size and Type 1.6 ~ 2.4 mm & 2% Thoriated (EWTh-2)
(Pure Tungsten, 2% Thoriated, etc.)

Mode of Metal Transfer for GMAW (FCAW) N/A
(Spray Arc, Short-Circuiting Arc, etc.)

Other N/A

TECHNIQUE (QW - 410)

String or Weave Bead	Max. stringer or weaver within 2.5 time diameter of electrodes
Orifice, Nozzle, or Gas Cup Size	5, 6, or 7
Initial and Interpass Cleaning (Brushing, Grinding, etc.)	Brushing & Grinding with SS Material
Method of Back Gouging	Back Grinding with SS Material
Oscillation	N/A
Contact Tube to Work Distance	12 ~ 19 mm (GTAW)
Multiple or Single Pass (Per Side)	Single & Multiple
Multiple or Single electrode	Single
Electrode Spacing	N/A
Peening	N/A
Other	Welds shall be cleaned between each pass. When completed, remove all slag & projection with SS grinding & Brushing

Nomor Registrasi Migas
AYG - 07981/0842/2020

WELDING INSPECTOR

Office & Work Shop Address: Jl. Raya Bojonegara - Serdang RT/RW. 001/001 No.44
Desa Kertasana, Kec. Bojonegara, Kab. Serang, Banten - Indonesia 42454
Phone : +62-254-7850344/5/6, Fax : +62-254-785037

WELDING PROCEDURE SPECIFICATION (WPS)

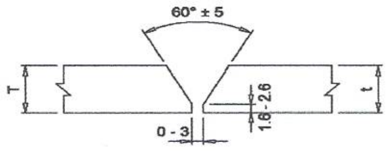
In accordance with
Section IX, ASME Boiler and Pressure Vessel Code

Welding Procedure Specification No. : 002/HEI/MIGAS/20 Rev. 0

JOINT DETAILS

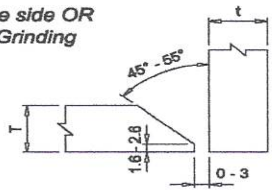
SINGLE VEE GROOVE
T = t

Welded from one side



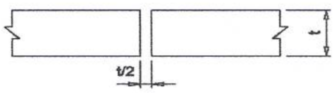
SINGLE BEVEL - CORNER JOINT
T = t

Welded from one side OR both side Back Grinding



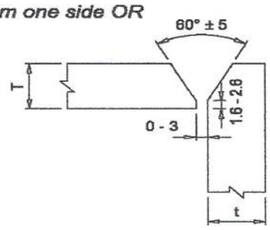
SQUARE BUTT

Welded from BOTH SIDES, T = 6 mm Max
Root gap, 0 - t/2



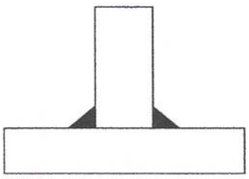
SINGLE VEE GROOVE
T = t

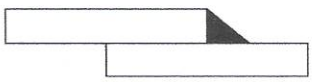
Welded from one side OR both side



SINGLE OR DOUBLE FILLET

UNLIMITED





For Non-Impact tested applications only, the following AWS/SFA clasification can be used with this procedure :
GTAW : ER309L / 5.9 & SMAW : E309L-16 / 5.4

Weld Joint description shown are not inclusive of all of those found on job site. Weld joint design reference in an engineering specification or design shall take precedence over weld joint shown in this WPS.

Organization Prepared by,	Verified by
PT. HANAZONO ENG. INDONESIA	**MINISTRY OF ENERGY AND MINERAL RESOURCES**
	DIRJEN MIGAS
	Nomor Registrasi Migas
	AYG - 07981 / 08V2 / 2020
Date : October 1, 2020	*Date : October 1, 2020*

PT. HANAZONO Engineering Indonesia
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Office & Work Shop Address: Jl. Raya Bojonegara - Serdang RT/RW. 001/001 No.44
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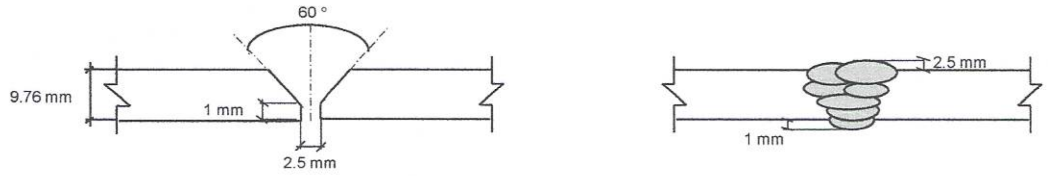
PROCEDURE QUALIFICATION RECORD (PQR)

Record Actual Conditions Used to Weld Test Coupon

Organization Name: PT. HANAZONO ENGINEERING INDONESIA
Procedure Qualification Record No.: 002/HEI/MIGAS/20 Date: 29/09/2020
WPS No.: 002/HEI/MIGAS/20
Welding Process (es): GTAW & SMAW
Types (Manual, Automatic, Semi-Automatic: Manual

JOINTS (QW - 402)



Groove Design of Test Coupon

(For combination qualifications, the deposited weld metal thickness shall be recorded for each filler metal and process used.)

BASE METAL (QW - 403)

Material Spec.: SA-240 TO A516
Type or Grade, or UNS Number: TP304 TO Gr. 70N
P-No. 8 Group No. 1 to P-No. 1 Group No. 2
Thickness of Test Coupon: 9.76 mm
Diameter of Test Coupon: N/A
Maximum Pass Thickness: ≤½ in. (13mm)
Other:

FILLER METAL (QW - 404)

SFA Specification	5.9	5.4
AWS Specification	ER309L	E309L-16
Filler Metal F-No.	6	5
Weld Metal Analysis A-No.	8	8
Size of Filler Metal	Ø2.4 mm	Ø3.2 mm
Filler Metal Product Form	Solid Bare	Flux Coated
Supplemental Filler Metal	N/A	N/A
Electrode Flux Classification	N/A	N/A
Flux Type	N/A	Lime Titania
Flux Trade Name	N/A	N/A
Weld Metal Thickness	3 mm	6,76 mm
Other	BOHLER S CN 23/12-IG	AVESTA 309L-16

POSITION (QW - 405)

Position(s) of Groove: 1G
Weld Progression (Uphill, Downhill): N/A
Other: N/A

PREHEAT (QW - 406)

Preheat Temperature: 36°C
Interpass Temperature: 150°C
Other: N/A

POSTWELD HEAT TREATMENT (QW - 407)

Temperature Range: N/A
Time: N/A
Others: N/A

GAS (QW - 408)

	Persent Composition		
	Gas (es)	Mixture	Flow Rate
Shielding	Argon	99,99%	12 LPM
Trailing	-	-	-
Backing	Argon	99,99%	10 LPM

ELECTRICAL CHARACTERISTIC (QW - 409)

Current: DCEN (GTAW) & DCEP (SMAW)
Polarity: *See Table Welding Parameter*
Amps: *See Table Welding Parameter*
Waveform Control: N/A
Power or Energy: *See Table Welding Parameter*
Arc Time: 5 - 10 Minutes / Pass
Weld Bead Length: 4 mm (GTAW) & 5mm (SMAW)
Tungsten Electrode Size: 2.4mm & 2% Thoriated (EWTh-2)
Mode of Metal Transfer for GMAW (FCAW): N/A
Heat Input: *See Table Welding Parameter*
Other: N/A

TECHINQUE (QW - 410)

Travel Speed: *See Table Welding Parameter*
String or Weave Bead: String & Weave Bead
Osciliation: N/A
Multipass or Single Pass (Per Side): Single & Multipass
Single or Multiple Electrodes: Single
Other: N/A

WELDING INSPECTOR TWI MIGAS
Nomor Registrasi Migas
AYG -07981/0842/2020

PT. HANAZONO Engineering Indonesia
We are always partner with you

Office & Work Shop Address: Jl. Raya Bojonegara - Serdang RT/RW. 001/001 No.44
Desa Kertasana, Kec. Bojonegara, Kab. Serang, Banten - Indonesia 42454
Phone : +62-254-7850344/5/6, Fax : +62-254-785037

PROCEDURE QUALIFICATION RECORD (PQR)

Record Actual Conditions Used to Weld Test Coupon

Procedure Qualification Record No. : 002/HEI/MIGAS/20 Rev. 0

WELDING PARAMETER

Weld No.	Welding Process	Filer Metal Class	Filer Metal Dia.	Type Polarity	Ampere	Volt	Travel Speed Range (mm/min)	Heat Input (J/mm)
1	GTAW	ER309L	2.4 mm	DCEN	80	10	24	2,0
2					167	14	72	1,9
3	SMAW	E309L-16	3.2 mm	DCEP	100	21	63	2,0
4					98	20	61	1,9
5					101	21	68	1,9
6					99	21	74	1,7
7					103	21	72	1,8

TENSILE TEST (QW - 160)

Specimen No.	Width (mm)	Thickness (mm)	Area (mm^2)	Ultimate Total Load (kN)	Ultimate Unit Stress (N/mm^2)	Type Failure & Location
T1	19,68	9,78	192,47	113,75	591	Fracture on Base Metal (CS)
T2	19,62	9,76	191,49	112,02	585	Fracture on Base Metal (CS)

GUIDE BEND TESTS (QW - 160)

Type and Figure No.	Result
SB1 - QW 462.2	**No Open Discontinuity**
SB2 - QW 462.2	
SB3 - QW 462.2	
SB4 - QW 462.2	

TOUGHNESS TESTS (QW - 170)

Specimen No.	Notch Location	Specimen Size	Test Temp. (°C)	Toughness Values % Shear	Toughness Values Mils (in.) or mm	Drop Weight Break (Y/N)
--Blank--						

Comments

Nomor Registrasi Migas
AYG -07981/0842/2020

WELDING INSPECTOR IM

PT. HANAZONO Engineering Indonesia
We are always partner with you

Office & Work Shop Address: Jl. Raya Bojonegara - Serdang RT/RW. 001/001 No.44
Desa Kertasana, Kec. Bojonegara, Kab. Serang, Banten - Indonesia 42454
Phone : +62-254-7850344/5/6, Fax : +62-254-785037

PROCEDURE QUALIFICATION RECORD (PQR)

Record Actual Conditions Used to Weld Test Coupon

Procedure Qualification Record No. : 002/HEI/MIGAS/20 Rev. 0

FILLET-WELD TEST (QW - 180)

Result - Satisfactory : Yes - No - Penetration into Parent Metal : Yes - No -

Macro - Result None

HARDNESS TESTS

Test No	Test Location	Vickers Hardness Value HV 10, Kgf/mm^2			Remarks
		12^{00}			
		Line 1	Line 2	Line 3	
---Blank---					

Other Tests

Type of Test N/A

Deposit Analysis N/A

Other Radiography examination, Result : ACC, Report No. : **001/RT/HEI/IX/20** by PT. Rire Sanjaya Sakti

Welder's Name **ASMURI** Clock No. - Stamp No. **W - 01**

Tests conducted by : **PT. HI-TEST** Laboratory Test No. : **HT/JKT/0920/0328**

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 Boiler and Pressure Vessel Code.

Organization Prepared by,
PT. HANAZONO ENG. INDONESIA

PT. HANAZONO Engineering Indonesia

Date : September 29, 2020

Verified by
MINISTRY OF ENERGY AND MINERAL RESOURCES
DIRJEN MIGAS

Nomor Registrasi Migas
AYG - 07981/0842/2020

WELDING INSPECTOR

Date : September 29, 2020

PT. voestalpine Böhler Welding Asia Pacific

voestalpine Böhler Welding Asia Pacific
Kawasan Industri Jababeka Cikarang
JL Industri Selatan 2 Blok JJ NO. 7-10
17530 Bekasi
T. +6221893 7572, F. +6221893 7518
www.voestalpine.com/welding

PT ALLALLOY CAHAYA DYNAWELD
JL. PANTAI INDAH SELATAN KOMP.
KAMAL MUARA, PENJARINGAN
14470 Jakarta Utara
Indonesia

Inspection certificate 3.1

as per : EN 10204
No. : 2020-2047012236-30-20007-025
Rev. 0

PO no.	ACD/AW-N/20/09/0794	of	07.09.2020
Order no.	1042004692		
Delivery note/pos./splitt	2047012236/000000/000030	of	21.09.2020

Product	GTAW rod/wire
Trade name	**BOHLER S CN 23/12-IG**
Standard designation	AWS A5.9 : ER309L ASME SFA5.9 : ER309L

Dimension	GTAW 2,4 x 1000 mm	118955
Lot no.	20007	77254 JSE6A00W
Quantity	100,0 KG	0425

Chemical composition in % of the product

C	Si	Mn	P	S	Cr	Mo	Ni	Cu	N	FN WRC				
0,01	0,40	1,84	0,024	0,009	23,42	0,05	12,55	0,03	0,12	10				

Mechanical properties **ASME II/Sched.F**

Tensile test according to : ASTM E8
Specimen preparation according to : AWS B4.0

T	ReL / Rp 0,2 MPa	Rp 1,0 MPa	Rm MPa	A (Lo = 4d) %	Z %	WBH PWHT	Remarks
25°C	≥ 320		≥ 520	≥ 30			

Impact test according to : ASTM E23
Specimen preparation according to : AWS B4.0

T	Impact energy KV / J	Average KV / J	Lateral expansion mm	Shear fracture %	WBH PWHT	Remarks
-60°C		≥ 46				

The product BOHLER S CN 23/12-IG meets the requirements of the filler metal specification ASME sec II, part C, AWS A5.9 : ER309L when tested in accordance with that specification.

Town	Date		Authorized representative
Bekasi	21.09.2020	This certificate was issued by DP-equipment and does not require signature.	Miftah Farid

voestalpine
ONE STEP AHEAD.

PT. voestalpine Böhler Welding Asia Pacific

voestalpine Böhler Welding Asia Pacific
Kawasan Industri Jababeka Cikarang
JL Industri Selatan 2 Blok JJ NO. 7-10
17530 Bekasi
T. +6221893 7572, F. +6221893 7518
www.voestalpine.com/welding

PT ALLALLOY CAHAYA DYNAWELD
JL. PANTAI INDAH SELATAN KOMP.
KAMAL MUARA, PENJARINGAN
14470 Jakarta Utara
Indonesia

Inspection certificate 3.1

as per : EN 10204
No. : 2020-2047012235-20-20582-025
Rev. 0 Page 1 of 1

PO no.	ACD/DN-N/20/08/0702	of	05.08.2020
Order no.	1042004626		
Delivery note/pos./splitt	2047012235/000000/000020	of	21.09.2020
Product	covered electrode		
Trade name	**BOHLER FOX S 309L-16**		
Standard designation	EN ISO 3581-A : E 23 12 L R 3 2		
	AWS A5.4 : E309L-16		
Dimension	SMAW 3,25 x 350 mm		118955
Lot no.	20582		77256
Quantity	24,6 KG		JSE6A00E
			0425

Chemical composition in % of the weld metal

C	Si	Mn	P	S	Cr	Mo	Ni	Cu	N	FN WRC				
0,02	0,87	0,70	0,015	0,025	23,35	0,03	12,74	0,05	0,05	14				

Mechanical properties **ASME II/Sched.F**

Tensile test according to : ASTM E8
Specimen preparation according to : AWS B4.0

T	ReL / Rp 0,2 MPa	Rp 1,0 MPa	Rm MPa	A (Lo = 4d) %	Z %	WBH PWHT	Remarks
25°C	≥ 320		≥ 520	≥ 30		AW	

Impact test according to : ASTM E23
Specimen preparation according to : AWS B4.0

T	Impact energy KV / J	Average KV / J	Lateral expansion mm	Shear fracture %	WBH PWHT	Remarks
-40°C		≥ 35			AW	

The product BOHLER FOX S 309L-16 meets the requirements of the filler metal specification ASME sec II, part C, AWS A5.4 : E309L-16 when tested in accordance with that specification.

Town	Date		Authorized representative
Bekasi	21.09.2020	This certificate was issued by DP-equipment and does not require signature.	Miftah Farid

voestalpine
ONE STEP AHEAD.

PT. RIRE SANJAYA SAKTI
Rope Access & NDT Services
Head Office : Jl. Wibawa Mukti II Kav.1 - 2Jati Asih
Bekasi 17423 - Jawa Barat, Indonesia
Phone : +62-21 8243 5561 / 8241 5794
Fax : +62-21 8243 5168
Email : admin@rss.co.id, Website : www.rss.co.id

RADIOGRAPHY EXAMINATION REPORT

Client : PT. HANAZONO ENGINEERING INDONESIA	Job No. : PQR	Report No. : 001/RT/HEI/IX/20
Contractor : -	Work Order / Request No. : -	Shooting Date : 18-09-2020
Project : PQR	Location : W/S - Cilegon	Date of Report : 19-09-2020

Radiographic Procedure : RSS/RT-ASME/003	Radiation Source : IR-192	Screen Type : LEAD	SFD : 381 mm / Inch	RT Tech : DWSI ■ DWDI ■ SWSI ■
Application Code : ASME VIII	F/S Source Size : 2.7 x 2.5 mm	Back / Front Thick : 0.125 mm	SSOF : 48 mm / Inch	IQI Type : S.Side ■ F.Side ■
Material Specification : A 240.304/ A 240.304, A 240.304/A 516 GR 70 N, A 516 GR 70N/ A 516 GR 70N, A 36/ A 36	Activity : 20 Ci	Double ■ Single Load ■	SOD : 333 mm / Inch	Sensitivity : WI. No.9 F. D: 2-4
	Exp. Time : 20 Min/Sec	Film type : AGFA D7	Sensitivity : ASTM 1B	Unsharp Geo : 0.5 mm

Identification	Joint No.	Material Size Thick	Film Sequence – Location Marker 4"X10"	4"X15"	7"X17"	Welder Stamp	Surface Indication	Crack	Incomplete Penetration	Incomplete Fusion	Slag Inclusion	Slag Lines	Concavity	Brun Though	Under Cut	Gas and Worm Hole	Porosity	Others	Sensitivity	Range Density	Judgment	Remarks
PQR/001/HEI/MIGAS/20	-	Thk 45 mm		A-B		W:													9	2.8-3.3	ACC	
PQR/002/HEI/MIGAS/20	-	Thk 10 mm		A-B		W:													9	2.8-3.2	ACC	
PQR/003/HEI/MIGAS/20	-	Thk 10 mm		A-B		W:													9	2.9-3.3	ACC	
PQR/004/HEI/MIGAS/20	-	Thk 22 mm		A-B		W:													9	2.7-3.2	ACC	
PQR/005/HEI/MIGAS/20	-	Thk 10 mm		A-B		W:													9	2.6-3.0	ACC	
PQR/006/HEI/MIGAS/20	-	Thk 10 mm		A-B		W:													9	2.7-3.1	ACC	
PQR/007/HEI/MIGAS/20	-	Thk 22 mm		A-B		W:													9	2.9-3.5	ACC	

Technician:	Comments :	Radiographer:	QA/QC Approved:	Authorized Inspector:	Customer Rep.:
Total Welds/Film Used : 7 Joints		NDE Level : II			
(4" x 10"): Sheets					
(4" x 15"): 7 Sheets					
(7" x 17"): Sheets		Date : 31-08-2019 TEGUH. P.	Date : 20/09/20	Date :	Date :

PT. RIRE SANJAYA SAKTI RADIOGRAPH TEST

PT. HANAZONO ENGINEERING INDONESIA

PT. Hi-Test
Laboratory of Mechanical Testing
BSD City :
Taman Tekno Blok A2 No. 49
Bumi Serpong Damai (BSD) – Tangerang - Indonesia
Telp : +62 21 75882884; Fax : +62 21 75882885
E-mail : hi-test@hitestlab.com
Website : www.hitestlab.com

KOMITE AKREDITASI NASIONAL
Laboratorium Penguji
LP - 422 - IDN

Testing Report

(This Report is issued subjected to the term & conditions set out below)

Customer	: **PT. Hanazono Engineering Indonesia**	**Job No**	: B20625
Address	: Jl. Bojonegara No. 44 Kertasana, Serang, Banten 42454	**No.**	: HT/JKT/0920/0328
		Total of Page	: 1 of 2
Reference Code	: ASME Sect. IX : 2019	**Date of Received**	: 22 September 2020
Test Method	: ASTM A370-19	**Date of Tested**	: 29 September 2020
Object to be tested	: (as received)	**PO No**	: **PO-E001-HTT-TOL-004**
		Project Name	: --
		Sample Marking	: 9. HEI 2

One welded stainless to carbon steel plate joint test sample, size: 10 mm thickness, material spec: A 240-304 to A 516 Gr. 70N, PQR No. PQR002/HEI/MIGAS/20, welding process: GTAW+SMAW, welding position: 1G, for Procedure Qualification Record Test.

Type of Test : **Reduced Section Tension Test (Transverse Specimen)**
Environment Temp : **25.1°C**

Test Specimen No		T1	T2
Measured Thickness	**(mm)**	9.78	9.76
Measured Width	**(mm)**	19.68	19.62
Effective Area	**(mm^2)**	192.47	191.49
Ultimate Tensile Load	**(kN)**	113.72	112.03
Ultimate Tensile Strength	**(N/mm^2)**	591	585
Location of Failure		Base Metal at 516 Gr. 70N	Base Metal at 516 Gr. 70N
Type of Failure		Ductile	Ductile

Testing Machine Used : INSTRON 600 DX,
Model: 600 DX, S/N: S2513, Capacity : 600 kN
Remark : ***A : A 240-304***
B : A 516 Gr. 70N
Test Conducted By : Canra Latipolia, ST
Witnessed By :

Approved Signatory

PT. Hi-Test JKT Laboratory of Mechanical Testing

Suhadi, ST
Laboratory Manager

PT. Hi-Test
Laboratory of Mechanical Testing
BSD City :
Taman Tekno Blok A2 No. 49
Bumi Serpong Damai (BSD) – Tangerang - Indonesia
Telp : +62 21 75882884; Fax : +62 21 75882885
E-mail : hi-test@hitestlab.com
Website : www.hitestlab.com

ilac-MRA

KAN
KOMITE AKREDITASI NASIONAL
Laboratorium Penguji
LP - 422 - IDN

Testing Report

(This Report is issued subjected to the term & conditions set out below)

Customer	: **PT. Hanazono Engineering Indonesia**	**Job No**	: B20625
Address	: Jl. Bojonegara No. 44 Kertasana, Serang, Banten 42454	**No.**	: HT/JKT/0920/0328
		Total of Page	: 2 of 2
Reference Code	: ASME Sect. IX : 2019	**Date of Received**	: 22 September 2020
Test Method	: ASTM E190-14	**Date of Tested**	: 29 September 2020
Object to be tested	: (as received)	**PO No**	: **PO-E001-HTT-TOL-004**
		Project Name	: --
		Sample Marking	: 9. HEI 2

One welded stainless to carbon steel plate joint test sample, size: 10 mm thickness, material spec: A 240-304 to A 516 Gr. 70N, PQR No. PQR002/HEI/MIGAS/20, welding process: GTAW+SMAW, welding position: 1G, for Procedure Qualification Record Test.

Type of Test : **Bending Test (Transverse Specimen)**

Test Temperature	:	**25.1°C**	
Test Weld Ment Thickness	:	10	mm
Former Diameter	:	40	mm
Shoulder Distance	:	63.2	mm
Test Specimen Width	:	38	mm
Bend Angle	:	180	Degree

Specimen No	Type of Bend	Observation	Result
FB1	Face Bend	No Open Discontinuity was Observed	Accepted
FB2	Face Bend	No Open Discontinuity was Observed	Accepted
RB1	Root Bend	No Open Discontinuity was Observed	Accepted
RB2	Root Bend	No Open Discontinuity was Observed	Accepted

Testing Machine Used : MOTOR PUMP BENDING TEST MACHINE,
Model : Daventry England, S/N : DG 8881, Capacity : 700 Bar

Remark : --

Test Conducted By : Canra Latipolia, ST

Witnessed By :

Approved Signatory

PT. Hi-Test JKT Laboratory of Mechanical Testing

Suhadi, ST
Laboratory Manager

ORIGINAL

검 사 증 명 서
MILL TEST CERTIFICATE

동국제강주식회사
DONGKUK STEEL MILL CO., LTD.

주문번호/Order No. : P194500138
발주번호/PO No. :
품명/Commodity : STEEL PLATE
제품규격/Specification : ASTM A516-70N/ASME SA516-70N

고객사/Supplier : JUNGJIN
수요가/Customer : 탑스틸

검사증명서번호/Certificate No. : DP3-2-190606-022-001
발행일자/Date of issue : 2019-06-06

제품치수 Dimension 단위 Unit Inch: ", mm: Space	제품번호 Product No	수량 Quantity	중량 Weight kg	제강번호 Heat No	Position	인장시험 Tensile Test GL	YP02 N/mm²	TS N/mm²	EL %	경도시험 Hardness HB	Division	C 2	Si 2	Mn 2	P 3	S 3	Cr 3	Ni 3	Cu 3	Mo 3	Nb 3	Ti 3	V 3	Remarks
10.00*3048*6096 *Specimen No:DP08221216-a, DP08221215-d ** Normalized:910 ° C,30min	A670179-01,02		2,188	PK115635	T	1	346	527	25	139	L	16	37	139	18	4	20	10	10	3	2	18	2	
	Sub Total (20)	3	4,376																					
19.00*3048*6096 *Specimen No:DP08266721-a, DP08266721-d ** Normalized:910 ° C,35min	A673276-01		2,772	PK696499	T	1	343	531	27	142	L	17	38	144	18	4	20	10	10	5	1	2	2	
	Sub Total (40)	1	2,772																					
22.00*3048*6096 *Specimen No:DP08266525-a, DP08266525-d ** Normalized:910 ° C,36min	A673334-01		3,209	PK696496	T	1	365	541	25	147	L	16	37	142	20	3	20	10	10	5	1	2	2	
	Sub Total (50)	1	3,209																					
25.00*3100*6096 *Specimen No:DP08227613-a, DP08227613-d ** Normalized:910 ° C,45min	A673275-01		3,708	PK404319	T	1	352	529	27	149	L	15	33	144	14	3	20	140	190	12	1	16	26	
	Sub Total (60)	1	3,708																					

* Tensile Test Direction-Transverse
* Ceq = C+Mn/6+(Ni+Cu)/15+(Cr+Mo+V)/5
* Supply Condition - Normalized
* Chemical Composition Unit : 2-x100, 3-x1000, 4-x10000

We hereby certify that the material has been made by basic oxygen process (Fully killed steel, Fine grain practice) and satisfactorily tested in accordance with above specification requirement called for by the above order. If the amount of Cr, Ni, Cu, Mo, Ti or Si is blank, the heat analysis for that element is less than 0.02% and/or of Nb, V is blank, it is less than 0.008%. * Inspection documents : According to EN 10204 Type 3.1. NACE MR0175 Hardness only.

본 주문품은 상기의 규격용도 외 타용도로 사용시 제품손상 및 안전사고등의 문제가 발생할 수 있으며, 본 검사증명서를 위조 또는 변조시 형사법에 의해 처벌될 수 있습니다.

* Specimen No. : a-Tension, d-Hardness
* Position : T-Top, M-Middle, B-Bottom
* Division : L-Ladle Analysis, P-Product Analysis
* Sub(Sub Size, Real Value, mm) : Blank-Full Size, 1-7.5*10, 2-5.0*10
* GL(Gauge Length, mm) : 1-200, 2-100, 3-80, 4-70, 5-50, 6-5.65√A, 7-5d, 8-4d, 9-8d
* T(S).Al : Total(Soluble) Al *Tr : Trace
* NRL Result : G-No Break, B-Break
* TTP(Through Thickness Position) : 1-Surface, 2-1/4T, 3-1/2T

원본검증 방법 : 동국제강 홈페이지 접속 (www.dongkuk.co.kr) → e비즈니스 클릭(홈페이지 하단) → 검사증명서 원본검증 클릭 → 정보입력후 검색

Surveyor to | Surveyor to | Surveyor to | Surveyor to | Chief of Quality Control Team

Dangjin Works, 25, Godaegongdan 1-gil, Songak-eup, Dangjin-si, Chungcheongnam-do, Republic of Korea/Quality Control Team, TEL. 041-351-4633

DONGKUK STEEL

ORIGINAL

검 사 증 명 서
MILL TEST CERTIFICATE

동국제강주식회사 DONGKUK STEEL MILL CO., LTD.

주문번호/Order No. : P194500138
발주번호/PO No. :
품명/Commodity : STEEL PLATE
제품규격/Specification : ASTM A516-70N/ASME SA516-70N

고객사/Supplier : JUNGJIN
수요가/Customer : 탑스틸

검사증명서번호/Certificate No. : DP3-2-190606-022-O01
발행일자/Date of issue : 2019-06-06

제품치수 Dimension 단위 Unit inch: ", mm: Space	제품번호 Product No	수량 Quantity	중량 Weight kg	화학성분(%) Chemical Composition T.Al 3	S.Al 3	Ceq 3	B 4	Remarks
10.00*3048*6096 *Specimen No:DP08221216-a, DP08221215-d ** Normalized:910 ° C,30min	A670179-01,02		2,188		33	398	1	
	Sub Total (20)	3	4,376					
19.00*3048*6096 *Specimen No:DP08266721-a, DP08266721-d ** Normalized:910 ° C,35min	A673276-01		2,772		40	417	1	
	Sub Total (40)	1	2,772					
22.00*3048*6096 *Specimen No:DP08266525-a, DP08266525-d ** Normalized:910 ° C,36min	A673334-01		3,209		30	403	1	
	Sub Total (50)	1	3,209					
25.00*3100*6096 *Specimen No:DP08227613-a, DP08227613-d ** Normalized:910 ° C,45min	A673275-01		3,708		37	424	1	
	Sub Total (60)	1	3,708					

DONGWOO CO., LTD. H. Y. Jeong QUALITY MANAGER

* Tensile Test Direction-Transverse
* Ceq = C+Mn/6+(Ni+Cu)/15+(Cr+Mo+V)/5
* Supply Condition - Normalized
* Chemical Composition Unit : 2-x100, 3-x1000, 4-x10000

We hereby certify that the material has been made by basic oxygen process (Fully killed steel, Fine grain practice) and satisfactorily tested in accordance with above specification requirement called for by the above order. If the amount of Cr, Ni, Cu, Mo, Ti or Si is blank, the heat analysis for that element is less than 0.02% and/or of Nb, V is blank, it is less than 0.008%. * Inspection documents : According to EN 10204 Type 3.1. NACE MR0175 Hardness only.

본 주문품은 상기의 규격용도 외 타용도로 사용시 제품손상 및 안전사고등의 문제가 발생할 수 있으며, 본 검사증명서를 위조 또는 변조시 형사법에 의해 처벌될 수 있습니다.

* Specimen No. : a-Tension, d-Hardness
* Position : T-Top, M-Middle, B-Bottom
* Division : L-Ladle Analysis, P-Product Analysis
* Sub(Sub Size, Real Value, mm) : Blank-Full Size, 1-7.5*10, 2-5.0*10
* GL(Gauge Length, mm) : 1-200, 2-100, 3-80, 4-70, 5-50, 6-5.65√A, 7-5d, 8-4d, 9-8d
* T(S).Al : Total(Soluble) Al *Tr : Trace
* NRL Result : G-No Break, B-Break
* TTP(Through Thickness Position) : 1-Surface, 2-1/4T, 3-1/2T

원본검증 방법 : 동국제강 홈페이지 접속 (www.dongkuk.co.kr) → e비즈니스 클릭(홈페이지 하단) → 검사증명서 원본검증 클릭 → 정보입력후 검색

Surveyor to | Surveyor to | Surveyor to | Surveyor to | Chief of Quality Control Team

Dangjin Works, 25, Godaegongdan 1-gil, Songak-eup, Dangjin-si, Chungcheongnam-do, Republic of Korea/Quality Control Team, TEL. 041-351-4633

BAHRU STAINLESS

INSPECTION CERTIFICATE 3.1

ISSUE DATE: 2017-08-26

ACCORDING TO: EN 10204 | CERTIFICATE NO 152121 | Rev 1

MANUFACTURER'S MARK	BHS	INSPECTOR'S STAMP	BHS425	MELTING PROCESS	E/AOD

CUSTOMER:

PT PARADISE PERKASA
JL PANGERAN JAYAKARTA 66,KOMPLEK PESONA JAYAKARTA LESTARI,
BLOK B 6 MANGGA DUA SELATAN, SAWAH BESAR,JAKARTA PUSAT,
DKI JAKARTA, 10730

Indonesia

ORDER No.	ITEM No.	DELIVERY NOTE No.
BE05338	11	DEL044196

CUSTOMER ORDER No.: 2117100086

REQUIREMENTS

SPECIFICATIONS	MATERIAL CODE	
ASTM A240 / A240M-15a	304L	304
ASME BPVC-IIA SA240 / SA240M-2013	304L	304

CASE

BPC1G31756 [1750 kg]
BPC1G31757 [2112 kg]
BPC1G31758 [2110 kg]

Item No.: ....
CERTIFIED TRUE COPY
Signature :
PT. PARADISE PERKASA

TOLERANCE: ASTM/ASME

PRODUCT: No. 1 Finish,Hot rolled annealed and pickled

KURZNAME:

HEAT No.: 410812

DIMENSIONS:	10 mm X 1220 mm X 2440 mm	QUANTITY	25	MASS	2928 Kg	MATERIAL No.:	A0038966

CHEMICAL COMPOSITION (%)

	C	S	P	Mn	Si	Cr	Ni	N					
Min						17.5	8.0						
Max	0.030	0.030	0.045	2.00	0.75	19.5	10.5	0.10					
Actual	0.019	0.001	0.033	1.72	0.40	18.3	8.1	0.07					

MECHANICAL PROPERTIES

TEMPERATURE	DIRECTION	POSITION	Rm MPa	Rp0.2 MPa	A50 %	HRBW HRBW					
Ambient	Transverse	Requirement Min	515	205	40						
		Max				92					
Ambient	Transverse	Head	642	316	49	85					
		Tail				88					

INTERGRANULAR CORROSION	
SPECIFICATION	RESULT
ASTM A262 Practice E	PASS

HEAT TREATMENT (SOLUTION ANNEALED)	
Anneal °C	Quench
1050 - 1100	AIR/SPRAY

This material is free from mercury contamination.
The radiation level exhibited by this material is not greater than the normal background level.
This document is issued without alteration or erasure and may only be reproduced in full.

Tests to verify batch and quality have been made. Verwechslungsprüfung wurde durchgeführt.
Visual and dimensional control: no exceptions. Besichtigungen und Abmessung: ohne Beanstandung.
The delivery is in accordance with the order. Die Lieferung entspricht den Bestellbedingungen.
This material meets the Hardness requirement of Nace MR-0175 & Nace MR-0103.
Material has been PMI Tested.

Rm = Tensile strength (UTS) | Rp0.2 = Yield/proof strength at 0.2% strain | Rp1.0 = Yield/proof strength at 1.0% strain | A5 = Elongation with gage length 5.65*Sqrt(cross-sectional area) | A5 = Elongation with gage length 50 mm | HRBW = Rockwell hardness B scale

Bahru Stainless Sdn Bhd is certified with ISO 9001 & ISO 14001

BAHRU STAINLESS SDN BHD IS MEMBER OF ACERINOX GROUP

BAHRU STAINLESS
PTD 4069 (PLO 108), Jalan Rumbia 4
Tanjung Langsat Industrial Complex
81700 Pasir Gudang, Johor, Malaysia

Swin Le Teoh
QC ENGINEER

PT. HANAZONO Engineering Indonesia
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Office & Work Shop Address: Jl. Raya Bojonegara - Serdang RT/RW. 001/001 No.44
Desa Kertasana, Kec. Bojonegara, Kab. Serang, Banten - Indonesia 42454
Phone : +62-254-7850344/5/6, Fax : +62-254-785037

WELDING PROCEDURE SPECIFICATION (WPS)
In accordance with
Section IX, ASME Boiler and Pressure Vessel Code

Organization Name: PT. HANAZONO ENGINEERING INDONESIA By: Quality Department
Welding Procedure Specification No.: 006/HEI/MIGAS/20 Date: 01/10/2020 Supporting PQR No.(s): 006/HEI/MIGAS/20
Revision No.: 0 Date: 01/10/2020

Welding Process (es): GTAW & SMAW Type (s): Manual
(Automatic, Manual, Machine or Semi-Auto)

JOINT (QW - 402)

Joint Design: Single Vee or Any
Root Spacing: 0 ~ 3 mm
Backing: With / Without
Backing Material (Type): Air (GTAW) / Base Nor Weld Metal (GTAW / SMAW)

Details

See Joint Details

Sketches, production Drawings, Weld Symbols or Written Description Should show the general arrangement of the parts to be welded. Where applicable, the root spacing and the details of weld groove maybe specified.

Sketches may be attached to illustrate joint design, weld layers, and bead sequence (e.g., for toughness procedures, for multiple process procedures, etc.)

*BASE METALS (QW - 403)

P. No.: 1 Group No.:   to P. No.: 1 Group No.: -
OR
Specification type, grade, or UNS: -
to Specification type, grade, or UNS: -
OR
Chem. Analysis and Mech. Prop: -
to Chem. Analysis and Mech. Prop: -
Thickness Range :
Base Metal : Groove: 1.5 ~ 19.29 mm Fillet: All
Maximum Pass Thickness ≤½ in. (13mm) (Yes): All (No): -
Other:

*FILLER METALS (QW - 404)

	1	2
	GTAW	SMAW
Spec. No. (SFA)	5.18	5.1
AWS No. (Class)	ER70S-6	E7018
F - No.	6	4
A - No.	1	1
Size of Filler Metals	Ø 1.6 mm ~ 2.4 mm	Ø 3.2 ~ 4.0 mm
Weld Metal Deposit Thickness:		
Groove	Max. 6 mm	Max. 13.29 mm
Fillet	All	All
Electrode Flux (Class)	N/A	N/A
Flux Type	N/A	Low Hydrogen
Flux Trade Name	N/A	N/A
Consumable Insert	N/A	N/A
Other	Manufacturer : ESAB	
	Electrode Name : **OK Tigrod 12.64 & OK 48.04**	

*Each base metal-filler metal combination should be specified individually.

Nomor Registrasi Migas
AYG - 07081 / 0844 / 2020

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WELDING PROCEDURE SPECIFICATION (WPS)
In accordance with
Section IX, ASME Boiler and Pressure Vessel Code

Welding Procedure Specification No. : 006/HEI/MIGAS/20 Rev. 0

POISITIONS (QW- 405)

Position(s) of Grove: All
Welding Progression: All
Position(s) of Fillet: All

POSTWELD HEAT TREATMENT (QW - 407)

Temperature Range: N / A
Time Range: N / A

PREHEAT (QW - 406)

Preheat Temp. Min.: 34 °C
Interpass Temp. Max.: 260 °C
Preheat Maintenance: N/A *)
Other:
(Continuous or special heating, where applicable, should be specified)

GAS (QW - 408)

	Persent Composition		
	Gas (es)	Mixture	Flow Rate
Shielding	Argon	99,99%	7 - 15 LPM
Trailing	-	-	-
Backing	-	-	-
Other	-	-	-

ELECTRICAL CHARACTERISTIC (QW - 409)

Weld Pass(es)	Process	Filler Metal		Current Type & Polarity	Amps. (Range)	Wire Feed Speed (Range)	Energy or Power (Range)	Volts (Range)	Travel Speed (Range)	Other (e.g., Remarks, Comments, Hot Wire Addition, Technique, Process Torch Angle, etc.)
		Class	Dia.							
Root & Hot	GTAW	ER70S-6	1.6 ~2.4	DCEN	80 - 160	-	-	9 - 18	18 - 72	-
Fill & Capping	SMAW	E7018	3.2 / 4.0	DCEP	80 - 190	-	-	19 - 24	38 - 112	-

Amps and volts, or power or energy range, should be specified for each electrode size, position, and thickness, etc.

Pulsing Current: N/A
Heat Input (max.): 2.5J
Tungsten Electrode Size and Type: 1.6 ~ 2.4mm & 2% Thoriated (EWTh-2)
(Pure Tungsten, 2% Thoriated, etc.)
Mode of Metal Transfer for GMAW (FCAW): N/A
(Spray Arc, Short-Circuiting Arc, etc.)
Other: N/A

TECHNIQUE (QW - 410)

String or Weave Bead: Max. stringer or weaver within 2.5 time diameter of electrodes
Orifice, Nozzle, or Gas Cup Size: 5, 6, or 7
Initial and Interpass Cleaning (Brushing, Grinding, etc.): Brushing & Grinding
Method of Back Gouging: Back Grinding / Back Gouging
Oscillation: N/A
Contact Tube to Work Distance: 12 ~ 19 mm (GTAW)
Multiple or Single Pass (Per Side): Multiple
Multiple or Single electrode: Single
Electrode Spacing: N/A
Peening: N/A
Other: Welds shall be cleaned between each pass. When completed, remove all slag & projection with grinding & Brushing

Nomor Registrasi Migas
AYG - 07981 / 0844 / 2020

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WELDING PROCEDURE SPECIFICATION (WPS)

In accordance with
Section IX, ASME Boiler and Pressure Vessel Code

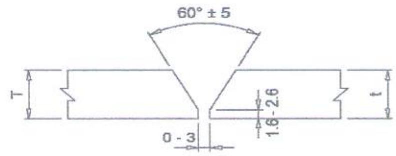
Welding Procedure Specification No. : 006/HEI/MIGAS/20 Rev. 0

JOINT DETAILS

SINGLE VEE GROOVE

T = t

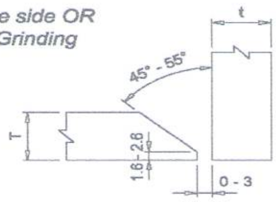
Welded from one side



SINGLE BEVEL - CORNER JOINT

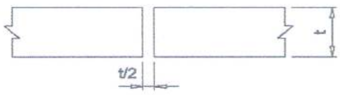
T = t

Welded from one side OR both side Back Grinding



SQUARE BUTT

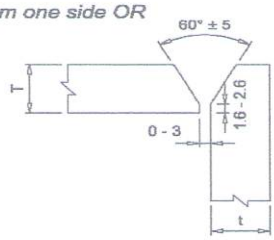
Welded from BOTH SIDES, T = 6 mm Max
Root gap, 0 - t/2



SINGLE VEE GROOVE

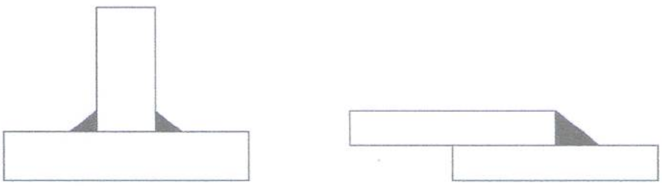
T = t

Welded from one side OR both side



SINGLE OR DOUBLE FILLET

UNLIMITED



For Non-Impact tested applications only, the following AWS/SFA clasification can be used with this procedure :

GTAW : ER70S-6 / 5.18 & SMAW : E7018 / 5.1

Weld Joint description shown are not inclusive of all of those found on job site. Weld joint design reference in an engineering specification or design shall take precedence over weld joint shown in this WPS.

Organization Prepared by,	Verified by
PT. HANAZONO ENG. INDONESIA	MINISTRY OF ENERGY AND MINERAL RESOURCES
	DIRJEN MIGAS
	Nomor Registrasi Migas
	AYG - 07981 / 0844 / 2020
Date : October 1, 2020	*Date : October 1, 2020*

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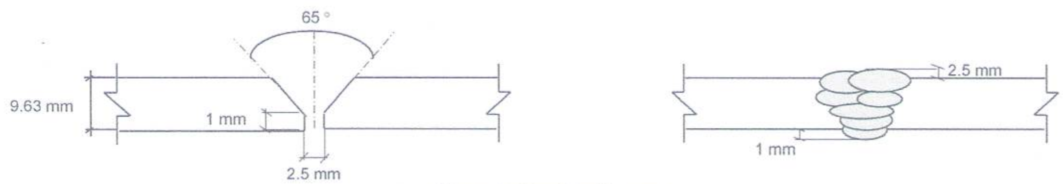
Phone : +62-254-7850344/5/6, Fax : +62-254-785037

PROCEDURE QUALIFICATION RECORD (PQR)

Record Actual Conditions Used to Weld Test Coupon

Organization Name: **PT. HANAZONO ENGINEERING INDONESIA**
Procedure Qualification Record No.: 006/HEI/MIGAS/20 Date: 29/09/2020
WPS No.: 006/HEI/MIGAS/20
Welding Process (es): GTAW & SMAW
Types (Manual, Automatic, Semi-Automatic: Manual

JOINTS (QW - 402)



Groove Design of Test Coupon

(For combination qualifications, the deposited weld metal thickness shall be recorded for each filler metal and process used.)

BASE METAL (QW - 403)

Material Spec.: A36 to A36
Type or Grade, or UNS Number: A36 to A36
P-No. 1 Group No. 1 to P-No. 1 Group No. 1
Thickness of Test Coupon: 9.645 mm
Diameter of Test Coupon: N/A
Maximum Pass Thickness: ≤½ in. (13mm)
Other:

FILLER METAL (QW - 404)

SFA Specification	5.18	5.1
AWS Specification	ER70S-6	E7018
Filler Metal F-No.	6	4
Weld Metal Analysis A-No.	1	1
Size of Filler Metal	Ø2.4 mm	Ø3.2 mm
Filler Metal Product Form	Solid Bare	Flux Coated
Supplemental Filler Metal	N/A	N/A
Electrode Flux Classification	N/A	N/A
Flux Type	N/A	Low Hydrogen
Flux Trade Name	N/A	N/A
Weld Metal Thickness	3 mm	6.645 mm
Other	OK Tigrod 12.64	OK 48.04

POSITION (QW - 405)

Position(s) of Groove: 1G
Weld Progression (Uphill, Downhill): N/A
Other: N/A

PREHEAT (QW - 406)

Preheat Temperature: 34°C
Interpass Temperature: 260°C
Other: N/A

POSTWELD HEAT TREATMENT (QW - 407)

Temperature Range: N/A
Time: N/A
Others: N/A

GAS (QW - 408)

	Persent Composition		
	Gas (es)	Mixture	Flow Rate
Shielding	Argon	99,99%	12 LPM
Trailing	-	-	-
Backing	-	-	-

ELECTRICAL CHARACTERISTIC (QW - 409)

Current: DCEN (GTAW) & DCEP (SMAW)
Polarity: *See Table Welding Parameter*
Amps: *See Table Welding Parameter*
Waveform Control: N/A
Power or Energy: *See Table Welding Parameter*
Arc Time: 5 - 10 Minutes / Pass
Weld Bead Length: 4 mm (GTAW) & 5 mm (SMAW)
Tungsten Electrode Size: 2.4mm & 2% Thoriated (EWTh-2)
Mode of Metal Transfer for GMAW (FCAW): N/A
Heat Input: *See Table Welding Parameter*
Other: N/A

TECHINQUE (QW - 410)

Travel Speed: *See Table Welding Parameter*
String or Weave Bead: String & Weave Bead
Osciliation: N/A
Multipass or Single Pass (Per Side): Single & Multipass
Single or Multiple Electrodes: Single
Other: N/A

Nomor Registrasi Migas
AYG - 07981/0844/2020

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PROCEDURE QUALIFICATION RECORD (PQR)

Record Actual Conditions Used to Weld Test Coupon

Procedure Qualification Record No. : 006/HEI/MIGAS/20 Rev. 0

WELDING PARAMETER

Weld No.	Welding Process	Filer Metal		Type Polarity	Ampere	Volt	Travel Speed Range (mm/min)	Heat Input (J/mm)
		Class	Dia.					
1	GTAW	ER70S-6	2.4 mm	DCEN	110	9	35	1,7
2					110	10	30	2,2
3	SMAW	E7018	3.2 mm	DCEP	92	20	47	2,3
4					87	20	53	2,0
5					95	20	52	2,2
6					85	19	50	1,9
7					85	19	55	1,8

TENSILE TEST (QW - 160)

Specimen No.	Width (mm)	Thickness (mm)	Area (mm^2)	Ultimate Total Load (kN)	Ultimate Unit Stress (N/mm^2)	Type Failure & Location
T1	19,51	9,63	187,88	108,22	576	Fracture on base metal
T2	19,57	9,66	189,05	109,84	581	Fracture on base metal

GUIDE BEND TESTS (QW - 160)

Type and Figure No.	Result
SB1 - QW 462.2	**No Open Discontinuity**
SB2 - QW 462.2	**No Open Discontinuity**
SB3 - QW 462.2	**No Open Discontinuity**
SB4 - QW 462.2	**No Open Discontinuity**

TOUGHNESS TESTS (QW - 170)

Specimen No.	Notch Location	Specimen Size	Test Temp. (°C)	Toughness Values		Drop Weight Break (Y/N)
				% Shear	Mils (in.) or mm	
--Blank--						

Comments

Nomor Registrasi Mig...
AYG - 07981 / 0044 / 2020

WELDING INSPECTOR

PT. HANAZONO Engineering Indonesia
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PROCEDURE QUALIFICATION RECORD (PQR)

Record Actual Conditions Used to Weld Test Coupon

Procedure Qualification Record No. : 006/HEI/MIGAS/20 Rev. 0

FILLET-WELD TEST (QW - 180)

Result - Satisfactory : Yes - No - Penetration into Parent Metal : Yes - No -

Macro - Result None

HARDNESS TESTS

Test No	Test Location	Vickers Hardness Value HV 10, Kgf/mm^2			Remarks
		12^{oo}			
		Line 1	Line 2	Line 3	
---Blank---					

Other Tests

Type of Test None

Deposit Analysis None

Other Radiography examination, Result : ACC, Report No. : **001/RT/HEI/IX/20** by PT. Rire Sanjaya Sakti

Welder's Name **ASMURI** Clock No. - Stamp No. **W - 01**

Tests conducted by : **PT. HI-TEST** Laboratory Test No. : **HT/JKT/0920/0332**

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 Boiler and Pressure Vessel Code.

Organization Prepared by,
PT. HANAZONO ENG. INDONESIA

Date : September 29, 2020

Verified by
MINISTRY OF ENERGY AND MINERAL RESOURCES
DIRJEN MIGAS
Nomor Registrasi Migas
AYG - 07981/0844/2020

Date : September 29, 2020

PT. RIRE SANJAYA SAKTI
Rope Access & NDT Services
Head Office : Jl. Wibawa Mukti II Kav.1 - Jati Asih
Bekasi 17423 - Jawa Barat, Indonesia
Phone : +62-21 8243 5561 / 8241 5794
Fax : +62-21 8243 5168
Email : admin@rss.co.id, Website : www.rss.co.id

RADIOGRAPHY EXAMINATION REPORT

Client : PT. HANAZONO ENGINEERING INDONESIA	Job No. : PQR	Report No. : 001/RT/HEI/IX/20
Contractor : -	Work Order / Request No. : -	Shooting Date : 18-09-2020
Project : PQR	Location : W/S - Cilegon	Date of Report : 19-09-2020

Radiographic Procedure : RSS/RT-ASME/003	Radiation Source : IR-192	Screen Type : LEAD	SFD : 381 mm / Inch	RT Tech : DWSI ■ DWDI ■ SWSI ■
Application Code : ASME VIII	F/S Source Size : 2.7 x 2.5 mm	Back / Front Thick : 0.125 mm	SSOF : 48 mm / Inch	IQI Type : S. Side ■ F.Side ■
Material Specification : A 240.304/ A 240.304, A 240.304/A 516 GR 70 N, A 516 GR 70N/ A 516 GR 70N, A 36/ A 36	Activity : 20 Ci	Double ■ Single Load ■	SOD : 333 mm / Inch	Sensitivity : WL No.9 F. D : 2 - 4
	Exp. Time : 20 Min./Sec	Film type : AGFA D7	Sensitivity : ASTM 1B	Unsharp Geo : 0.5 mm

Identification	Joint No.	Material Size Thick	FILM SEQUENCE / Location Marker 4"X10"	4"X15"	7"X17"	Welder Stamp	Surface Indication	Crack	Incomplete Penetration	Incomplete Fusion	Slag Inclusion	Slag Lines	Concavity	Brun Though	Under Cut	Gas and Worm Hole	Porosity	Others	Sensitivity	Range Density	Judgment	Remarks
PQR/001/HEI/MIGAS/20	-	Thk 45 mm		A-B		W:													9	2.8-3.3	ACC	
PQR/002/HEI/MIGAS/20	-	Thk 10 mm		A-B		W:													9	2.8-3.2	ACC	
PQR/003/HEI/MIGAS/20	-	Thk 10 mm		A-B		W:													9	2.9-3.3	ACC	
PQR/004/HEI/MIGAS/20	-	Thk 22 mm		A-B		W:													9	2.7-3.3	ACC	
PQR/005/HEI/MIGAS/20	-	Thk 10 mm		A-B		W:													9	2.6-3.0	ACC	
PQR/006/HEI/MIGAS/20	-	Thk 10 mm		A-B		W:													9	2.7-3.1	ACC	
PQR/007/HEI/MIGAS/20	-	Thk 22 mm		A-B		W:													9	2.9-3.5	ACC	

Technician:		Radiographer:	QA/QC Approved:	Authorised Inspector:	Customer Rep.:
Total Welds/Film Used : 7 Joints (4" x 10"): Sheets (4" x 15"): 7 Sheets (7" x 17"): Sheets	Comments :	NDE Level : II Date : 31-08-2019 TEGUH.P.	Date : 20/09/20	Date :	Date :

INSPECTION CERTIFICATE (3.1) - Chemical analysis
TEST REPORT (2.2) - Mechanical properties

Date: 2020-02-12

Certificate number: EC25919813 rev. 0

Our order:
Our reference:
Customer number: NA
Customer order date:

Your order:
Your reference:
Your fax number:
Your e-mail:

Invoice address
NA

Receiver of certificate

Delivery address

DELIVERY — Lot number: PLU02009 — Quantity:

PRODUCT

Brand: ESAB
Description: OK 48.04 3.2x400mm
Item number: **480432HNR0**

CLASSIFICATIONS

SFA/AWS A5.1: E7018
EN ISO 2560-A: E 42 4 B 32 H5

MECHANICAL PROPERTIES

Typical data: acc to EN 10204 - 2.2

Standard:
Auxiliary:
Condition:

TENSILE

ReL	Rm	A5
480 MPa	560 MPa	28 %

IMPACT

Temp	-30 °C	-40 °C
KV	110 J	100 J

CHEMICAL COMPOSITION

Actual results: acc to EN 10204 - 3.1

All weld metal

Auxiliary:

C		0.09%
Si		0.35%
Mn		1.07%
P		0.015%
S		0.008%
Cr	<	0.1%
Ni	<	0.1%
Mo	<	0.1%
Nb	<	0.01%
Cu		0.02
V		0.01%

COMMENTS

Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.
This certificate is produced electronically and is valid without signature.
Please refer any queries to:

PT. VICTOR TEKNOLOGI INDONESIA; Kawasan Industri Kota Bukit Indah Blok AII No. 4; Purwakarta 41181; Jawa Barat - Indonesia.

Validation - Chemical Analysis
Miftakhudin Zaeni — Quality Assurance Manager

Validation - Others
J-P Ernoult — Product Manager

INSPECTION CERTIFICATE (3.1) - Chemical analysis
TEST REPORT (2.2) - Mechanical properties

Date: 2019-11-22

Certificate number: EC25830081 rev. 0

Our order:
Our reference:
Customer number: NA
Customer order date:

Your order:
Your reference:
Your fax number:
Your e-mail:

Invoice address
NA

Receiver of certificate

Delivery address

DELIVERY   Lot number: PVT21611205   Quantity:

PRODUCT

Brand: ESAB
Description: OK Tigrod 12.64 2.4x1000mm 5kg
Item number: **126424R150**

CLASSIFICATIONS

EN ISO 636-A: W 46 4 4Si1
EN ISO 636-A: W4Si1
SFA/AWS A5.18: ER70S-6

MECHANICAL PROPERTIES

Typical data: acc to EN 10204 - 2.2

Standard: EN
Auxiliary: I1
Condition:

TENSILE

ReL	Rm	A4-A5
525 MPa	595 MPa	26 %

IMPACT

Temp	-40 °C
KV	150 J

CHEMICAL COMPOSITION

Actual results: acc to EN 10204 - 3.1

Wire/strip

Auxiliary:

C		0.08%
Si		0.88%
Mn		1.62%
P		0.002%
S		0.010%
Cr		0.03%
Ni		0.01%
Mo	<	0.01%
Cu		0.06%
V		0.01%
Al		0.01%
Ti+Zr		0.03%

COMMENTS

Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.
This certificate is produced electronically and is valid without signature.
Please refer any queries to:

PT Esabindo Pratama; Pulogadung; Indonesia; Tel : 62-21-460 0188; Fax : 62-21-461 2929

Validation - Chemical Analysis
Josef Moravek   Quality Manager

Validation - Others
Jose Abal Lopez,H. Rasmuson   Product Manager,

PT. GUNUNG RAJA PAKSI

Plate Mill

MILL TEST CERTIFICATE

Purchaser

Acc to EN 10204 - 3.1

Head Office & Factory
Imam Bonjol 4, Warung Bongkok, Desa Sukadanau
Cikarang Barat, Bekasi, West Java, Indonesia

Material : Hot Rolled Steel Plates
Specification : ASME SA 36
General Requirement : ASTM A 6
Supply Condition : As Rolled
Killed

CERTIFICATE NUMBER : GRP - QA - MTC / 0833 / X / 2018
CERTIFICATE DATE : October 26, 2018
S / O No. : L 1083 / MKT - PROD / X / 2018

HEAT NUMBER	Plate Number	DIMENSIONS T mm	W mm	L mm	WEIGHT MT	QTY (PCS)	CHEMICAL LADLE ANALYSIS (%) C	Si	Mn	P	S	Nb	Cu	Cr	Ni	Mo	V	Al	Ti	N	CE	TENSILE TEST (TR Dir.) Y.S. N/mm²	T.S. N/mm²	EL. (%) on 200 mm	BEND TEST 180° / T	IMPACT VALUE (JOULE) (°C) T > 10mm : 10 X 10; T > 7.5 ≤ 10MM : 7.5 X 10; T > 5 ≤ 7.5mm : 5 X 10 I	II	III	AV
							REFERENCE																						
HQ2 U 2105189	D-0/1-12	10	1219	2438	2.748	12	0.17	0.27	0.86	0.012	0.007	<0.010	0.04	0.02	0.02	<0.01	<0.005	0.026	<0.005	0.009	0.32	326	492	26					
HQ2 U 2105189	D-0/1-88	10	1219	2438	20.152	88	0.17	0.27	0.86	0.012	0.007	<0.010	0.04	0.02	0.02	<0.01	<0.005	0.026	<0.005	0.009	0.32	346	499	24					
HQ2 U 2105189	E-0/1-85	10	1219	2438	19.465	85	0.17	0.27	0.86	0.012	0.007	<0.010	0.04	0.02	0.02	<0.01	<0.005	0.026	<0.005	0.009	0.32	326	492	26					
HQ2 U 2105189	H-0/1-87	10	1219	2438	19.923	87	0.17	0.27	0.86	0.012	0.007	<0.010	0.04	0.02	0.02	<0.01	<0.005	0.026	<0.005	0.009	0.32	326	489	24					
HQ2 U 2105189	M-0/1-86	10	1219	2438	19.694	86	0.17	0.27	0.86	0.012	0.007	<0.010	0.04	0.02	0.02	<0.01	<0.005	0.026	<0.005	0.009	0.32	346	499	24					
HQ2 U 2105189	N-0/1-85	10	1219	2438	19.465	85	0.17	0.27	0.86	0.012	0.007	<0.010	0.04	0.02	0.02	<0.01	<0.005	0.026	<0.005	0.009	0.32	346	489	24					
		Total Weight		101.447		MT																							
		Total Qty		443		PCS																							
HQ2 U 2801294	H-0/1-67	12	1219	2438	18.425	67	0.18	0.261	1.18	0.012	0.0092	0.001	0.03	0.02	0.01	0.003	0.002	0.043	0.003	0.0039	0.38	352	519	23					
HQ2 U 2801294	M-0/1-86	12	1219	2438	18.700	68	0.18	0.261	1.18	0.012	0.0092	0.001	0.03	0.02	0.01	0.003	0.002	0.043	0.003	0.0039	0.38	346	521	21					
HQ2 U 2801294	N-0/1-65	12	1219	2438	13.475	49	0.18	0.261	1.18	0.012	0.0092	0.001	0.03	0.02	0.01	0.003	0.002	0.043	0.003	0.0039	0.38	346	521	21					
		Total Weight		50.600		MT																							
		Total Qty		184		PCS																							

REMARKS :

We hereby certify that the material described herein has been made and satisfactorily tested in accordance with the above specification

PREPARED BY

SUDIRMAN

ACKNOWLEDGED BY,

USWATUN KHASANAH
QUALITY ASSURANCE

GRP.FM.QA.12

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Laboratorium Penguji
LP - 422 - IDN

Testing Report

(This Report is issued subjected to the term & conditions set out below)

Customer	: **PT. Hanazono Engineering Indonesia**	**Job No**	: B20625
Address	: Jl. Bojonegara No. 44 Kertasana, Serang, Banten 42454	**No.**	: HT/JKT/0920/0332
		Total of Page	: 1 of 2
Reference Code	: ASME Sect. IX : 2019	**Date of Received**	: 22 September 2020
Test Method	: ASTM A370-19	**Date of Tested**	: 29 September 2020
Object to be tested	: (as received)	**PO No**	: **PO-E001-HTT-TOL-004**
		Project Name	: --
		Sample Marking	: 9. HEI 6

One welded carbon steel plate joint test sample, size: 10 mm thickness, material spec: A 36, PQR No. PQR006/HEI/MIGAS/20, welding process: GTAW+SMAW, welding position: 1G, for Procedure Qualification Record Test.

Type of Test : **Reduced Section Tension Test (Transverse Specimen)**
Environment Temp : **25.1°C**

Test Specimen No		T1	T2
Measured Thickness	**(mm)**	9.63	9.66
Measured Width	**(mm)**	19.51	19.57
Effective Area	**(mm^2)**	187.88	189.05
Ultimate Tensile Load	**(kN)**	108.25	109.89
Ultimate Tensile Strength	**(N/mm^2)**	576	581
Location of Failure		Base Metal	Base Metal
Type of Failure		Ductile	Ductile

Testing Machine Used : INSTRON 600 DX,
Model: 600 DX, S/N: S2513, Capacity : 600 kN
Remark : --
Test Conducted By : Canra Latipolia, ST
Witnessed By :

Approved Signatory

PT. Hi-Test JKT Laboratory of Mechanical Testing

Suhadi, ST
Laboratory Manager

PT. Hi-Test
Laboratory of Mechanical Testing

BSD City :
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LP - 422 - IDN

Testing Report

(This Report is issued subjected to the term & conditions set out below)

Customer	: **PT. Hanazono Engineering Indonesia**	**Job No**	: B20625
Address	: Jl. Bojonegara No. 44 Kertasana, Serang, Banten 42454	**No.**	: HT/JKT/0920/0332
		Total of Page	: 2 of 2
Reference Code	: ASME Sect. IX : 2019	**Date of Received**	: 22 September 2020
Test Method	: ASTM E190-14	**Date of Tested**	: 29 September 2020
Object to be tested	: (as received)	**PO No**	: **PO-E001-HTT-TOL-004**
		Project Name	: --
		Sample Marking	: 9. HEI 6

One welded carbon steel plate joint test sample, size: 10 mm thickness, material spec: A 36, PQR No. PQR006/HEI/MIGAS/20, welding process: GTAW+SMAW, welding position: 1G, for Procedure Qualification Record Test.

Type of Test : **Bending Test (Transverse Specimen)**

Test Temperature	:	**25.1°C**					
Test Weld Ment Thickness	:	10	mm	**Test Specimen Width**	:	38	mm
Former Diameter	:	40	mm	**Bend Angle**	:	180	Degree
Shoulder Distance	:	63.2	mm				

Specimen No	Type of Bend	Observation	Result
FB1	Face Bend	No Open Discontinuity was Observed	Accepted
FB2	Face Bend	No Open Discontinuity was Observed	Accepted
RB1	Root Bend	No Open Discontinuity was Observed	Accepted
RB2	Root Bend	Discontinuity 1.73 mm of Opening was Observed	Accepted

Testing Machine Used : MOTOR PUMP BENDING TEST MACHINE,
Model : Daventry England, S/N : DG 8881, Capacity : 700 Bar

Remark : --

Test Conducted By : Canra Latipolia, ST

Witnessed By :

Approved Signatory

PT. Hi-Test JKT Laboratory of Mechanical Testing

Suhadi, ST
Laboratory Manager

PT. HANAZONO Engineering Indonesia
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Phone : +62-254-7850344/5/6, Fax : +62-254-785037

WELDING PROCEDURE SPECIFICATION (WPS)

In accordance with
Section IX, ASME Boiler and Pressure Vessel Code

Organization Name: PT. HANAZONO ENGINEERING INDONESIA By: Quality Department
Welding Procedure Specification No.: 003/HEI/MIGAS/20 Date: 01/10/2020 Supporting PQR No.(s): 003/HEI/MIGAS/20
Revision No.: 0 Date: 01/10/2020

Welding Process (es): GTAW & SMAW Type (s): Manual
(Automatic, Manual, Machine or Semi-Auto)

JOINT (QW - 402) **Details**

Joint Design: Single Vee or Any
Root Spacing: 0 ~ 3 mm
Backing: With / Without
Backing Material (Type): Gas (GTAW) / Base nor Weld Metal (GTAW / SMAW)

See Joint Details

Sketches, production Drawings, Weld Symbols or Written Description Should show the general arrangement of the parts to be welded. Where applicable, the root spacing and the details of weld groove maybe specified.

Sketches may be attached to illustrate joint design, weld layers, and bead sequence (e.g., for toughness procedures, for multiple process procedures, etc.)

***BASE METALS (QW - 403)**

P. No.: 8 Group No.: to P. No.: 8 Group No.: -
OR
Specification type, grade, or UNS: -
to Specification type, grade, or UNS: -
OR
Chem. Analysis and Mech. Prop: -
to Chem. Analysis and Mech. Prop: -
Thickness Range :
Base Metal : Groove: 1.5 ~ 19.64 mm Fillet: All
Maximum Pass Thickness ≤½ in. (13mm) (Yes): All (No): -
Other:

***FILLER METALS (QW - 404)**

	1 GTAW	2 SMAW
Spec. No. (SFA)	5.9	5.4
AWS No. (Class)	ER308L, ER308H, ER316L	E308L-16, E308H-16, E316L-16
F - No.	6	5
A - No.	8	8
Size of Filler Metals	Ø 1.6 mm ~ 2.4 mm	Ø 3.2 ~ 4.0 mm
Weld Metal		
Deposit Thickness:		
Groove	Max. 6 mm	Max. 13.64 mm
Fillet	All	All
Electrode Flux (Class)	N/A	N/A
Flux Type	N/A	N/A
Flux Trade Name	N/A	Lime Titania
Consumable Insert	N/A	N/A
Other	Manufacturer : BOHLER / AVESTA	

Electrode Name : Bohler S EAS 2-IG & Avesta 308L-16, Bohler ER 308 H-IG & Avesta 308H-16, Bohler S EAS 4 M-IG & Bohler Fox S 316L-16

*Each base metal-filler metal combination should be specified individually.

Nomor Registrasi Migas
AYG - 07981 / 0041 / 2020

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WELDING PROCEDURE SPECIFICATION (WPS)

In accordance with
Section IX, ASME Boiler and Pressure Vessel Code

Welding Procedure Specification No. : 003/HEI/MIGAS/20 Rev. 0

POISITIONS (QW- 405)

Position(s) of Grove	All
Welding Progression	All
Position(s) of Fillet	All

POSTWELD HEAT TREATMENT (QW - 407)

Temperature Range	N / A
Time Range	N / A

PREHEAT (QW - 406)

Preheat Temp. Min.	32 °C
Interpass Temp. Max.	150 °C
Preheat Maintenance	N/A *)
Other	

(Continuous or special heating, where applicable, should be specified)

GAS (QW - 408)

	Persent Composition		
	Gas (es)	Mixture	Flow Rate
Shielding	Argon	99,99%	7 - 15 LPM
Trailing	-	-	-
Backing	Argon	99,99%	7 - 15 LPM
Other	-	-	-

ELECTRICAL CHARACTERISTIC (QW - 409)

Weld Pass(es)	Process	Filler Metal		Current Type & Polarity	Amps. (Range)	Wire Feed Speed (Range)	Energy or Power (Range)	Volts (Range)	Travel Speed (Range)	Other (e.g., Remarks, Comments, Hot Wire Addition, Technique, Process Torch Angle, etc.)
		Class	Dia.							
Root & Hot	GTAW	ER308L	1.6 ~2.4	DCEN	80 - 160	-	-	10 - 18	24 - 88	-
Fill & Capping	SMAW	E308L-16	3.2 ~ 4.0	DCEP	60 - 160	-	-	18 - 28	32 - 135	-

Amps and volts, or power or energy range, should be specified for each electrode size, position, and thickness, etc.

Pulsing Current N/A Heat Input (max.) 2.0 J

Tungsten Electrode Size and Type 1.6 ~ 2.4mm & 2% Thoriated (EWTh-2)
(Pure Tungsten, 2% Thoriated, etc.)

Mode of Metal Transfer for GMAW (FCAW) N/A
(Spray Arc, Short-Circuiting Arc, etc.)

Other N/A

TECHNIQUE (QW - 410)

String or Weave Bead	Max. stringer or weaver within 2.5 time diameter of electrodes
Orifice, Nozzle, or Gas Cup Size	5, 6, or 7
Initial and Interpass Cleaning (Brushing, Grinding, etc.)	Brushing & Grinding with SS Material
Method of Back Gouging	Back Grinding with SS Material
Oscillation	N/A
Contact Tube to Work Distance	12 ~ 19 mm (GTAW)
Multiple or Single Pass (Per Side)	Single & Multiple
Multiple or Single electrode	Single
Electrode Spacing	N/A
Peening	None
Other	Welds shall be cleaned between each pass. When completed, remove all slag & projection with SS grinding & Brushing

Nomor Registrasi Migas
AYG - 07981/0841/2020

WELDING INSPECTOR IMI

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WELDING PROCEDURE SPECIFICATION (WPS)

In accordance with
Section IX, ASME Boiler and Pressure Vessel Code

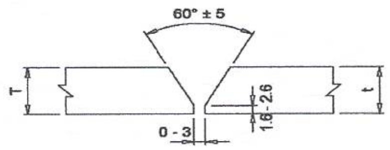
Welding Procedure Specification No. : 003/HEI/MIGAS/20 Rev. 0

JOINT DETAILS

SINGLE VEE GROOVE

T = t

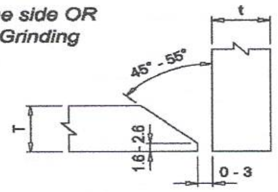
Welded from one side



SINGLE BEVEL - CORNER JOINT

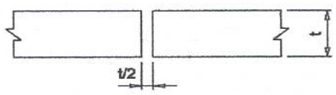
T = t

Welded from one side OR both side Back Grinding



SQUARE BUTT

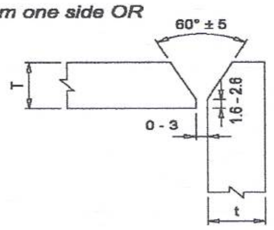
Welded from BOTH SIDES, T = 6 mm Max
Root gap, 0 - t/2



SINGLE VEE GROOVE

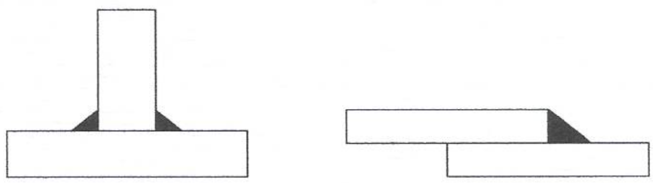
T = t

Welded from one side OR both side



SINGLE OR DOUBLE FILLET

UNLIMITED



For Non-Impact tested applications only, the following AWS/SFA clasification can be used with this procedure :
GTAW : ER308L / 5.9 & SMAW : E308L-16 / 5.4

Weld Joint description shown are not inclusive of all of those found on job site. Weld joint design reference in an engineering specification or design shall take precedence over weld joint shown in this WPS.

Organization Prepared by,	Verified by
PT. HANAZONO ENG. INDONESIA	**MINISTRY OF ENERGY AND MINERAL RESOURCES**
	DIRJEN MIGAS
	Nomor Registrasi Migas
	AYG - 07981/0841/2020
Date : October 1, 2020	*Date : October 1, 2020*

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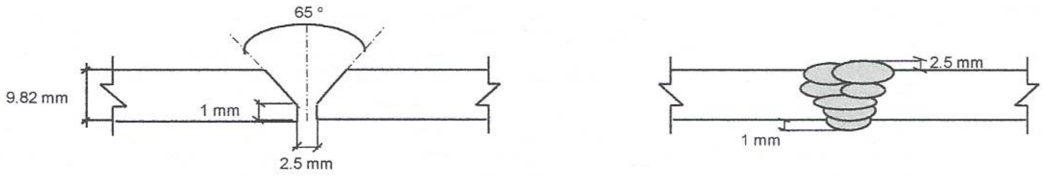
PROCEDURE QUALIFICATION RECORD (PQR)

Record Actual Conditions Used to Weld Test Coupon

Organization Name **PT. HANAZONO ENGINEERING INDONESIA**
Procedure Qualification Record No. 003/HEI/MIGAS/20 Date 29/09/2020
WPS No. 003/HEI/MIGAS/20
Welding Process (es) GTAW & SMAW
Types (Manual, Automatic, Semi-Automatic Manual

JOINTS (QW - 402)



Groove Design of Test Coupon

(For combination qualifications, the deposited weld metal thickness shall be recorded for each filler metal and process used.)

BASE METAL (QW - 403)

Material Spec. SA-240
Type or Grade, or UNS Number TP304
P-No. 8 Group No. 1 to P-No. 8 Group No. 1
Thickness of Test Coupon 9.82 mm
Diameter of Test Coupon N/A
Maximum Pass Thickness ≤½ in. (13mm)
Other

FILLER METAL (QW - 404)

SFA Specification	5.9	5.4
AWS Specification	ER308L	E308L-16
Filler Metal F-No.	6	5
Weld Metal Analysis A-No.	8	8
Size of Filler Metal	Ø2.4 mm	Ø3.2 mm
Filler Metal Product Form	Bare	Flux Coated
Supplemental Filler Metal	N/A	N/A
Electrode Flux Classification	N/A	N/A
Flux Type	N/A	Lime Titania
Flux Trade Name	N/A	N/A
Weld Metal Thickness	3 mm	6.82 mm
Other	BOHLER S EAS 2-IG	AVESTA 308L-16

POSITION (QW - 405)

Position(s) of Groove 1G
Weld Progression (Uphill, Downhill) N/A
Other None

PREHEAT (QW - 406)

Preheat Temperature 32°C
Interpass Temperature 150°C
Other N/A

POSTWELD HEAT TREATMENT (QW - 407)

Temperature Range N/A
Time N/A
Others N/A

GAS (QW - 408)

	Persent Composition		
	Gas (es)	Mixture	Flow Rate
Shielding	Argon	99,99%	11 LPM
Trailing	-	-	-
Backing	Argon	99,99%	9 LPM

ELECTRICAL CHARACTERISTIC (QW - 409)

Current DCEN (GTAW) & DCEP (SMAW)
Polarity *See Table Welding Parameter*
Amps *See Table Welding Parameter*
Waveform Control N/A
Power or Energy N/A
Arc Time 5 - 10 Minutes / Pass
Weld Bead Length 4 mm (GTAW) & 5 mm (SMAW)
Tungsten Electrode Size 2.4mm & 2% Thoriated (EWTh-2)
Mode of Metal Transfer for GMAW (FCAW) N/A
Heat Input *See Table Welding Parameter*
Other N/A

TECHINQUE (QW - 410)

Travel Speed *See Table Welding Parameter*
String or Weave Bead String & Weave Bead
Osciliation N/A
Multipass or Single Pass (Per Side) Single & Multipass
Single or Multiple Electrodes Single
Other N/A

Nomor Registrasi Migas
AYG - 07981/0841/2020
MIGAS

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PROCEDURE QUALIFICATION RECORD (PQR)

Record Actual Conditions Used to Weld Test Coupon

Procedure Qualification Record No. : 003/HEI/MIGAS/20 Rev. 0

WELDING PARAMETER

Weld No.	Welding Process	Filer Metal		Type Polarity	Ampere	Volt	Travel Speed Range (mm/min)	Heat Input (J/mm)
		Class	Dia.					
1	GTAW	ER308L	2.4 mm	DCEN	75	18	45	1,8
2					90	10	28	1,9
3	SMAW	E308L-16	3.2 mm	DCEP	95	21	61	2,0
4					85	20	53	1,9
5					80	20	52	1,8
6					68	19	50	1,6
7					74	19	53	1,6

TENSILE TEST (QW - 160)

Specimen No.	Width (mm)	Thickness (mm)	Area (mm^2)	Ultimate Total Load (kN)	Ultimate Unit Stress (N/mm^2)	Type Failure & Location
T1	19,61	9,87	193,55	107,42	555	Fracture on weld metal
T2	19,54	9,82	191,88	119,16	621	Fracture on weld metal

GUIDE BEND TESTS (QW - 160)

Type and Figure No.	Result
SB1 - QW 462.2	**No Open Discontinuity**
SB2 - QW 462.2	
SB3 - QW 462.2	
SB4 - QW 462.2	

TOUGHNESS TESTS (QW - 170)

Specimen No.	Notch Location	Specimen Size	Test Temp. (°C)	Toughness Values		Drop Weight Break (Y/N)
				% Shear	Mils (in.) or mm	
--Blank--						

Comments

Nomor Registrasi Migas
AYG - 07981/0841/2020

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PROCEDURE QUALIFICATION RECORD (PQR)

Record Actual Conditions Used to Weld Test Coupon

Procedure Qualification Record No. : 003/HEI/MIGAS/20 Rev. 0

FILLET-WELD TEST (QW - 180)

Result - Satisfactory : Yes - No - Penetration into Parent Metal : Yes - No -

Macro - Result None

HARDNESS TESTS

Test No	Test Location	Vickers Hardness Value HV 10, Kgf/mm^2			Remarks
		12^{00}			
		Line 1	Line 2	Line 3	
---Blank---					

Other Tests

Type of Test N/A

Deposit Analysis N/A

Other Radiography examination, Result : ACC, Report No. : **001/RT/HEI/IX/20** by PT. Rire Sanjaya Sakti

Welder's Name **ASMURI** Clock No. - Stamp No. **W - 01**

Tests conducted by : **PT. HI-TEST** Laboratory Test No. : **HT/JKT/0920/0329**

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 Boiler and Pressure Vessel Code.

Organization Prepared by,
PT. HANAZONO ENG. INDONESIA

Date : September 29, 2020

Verified by
MINISTRY OF ENERGY AND MINERAL RESOURCES
DIRJEN MIGAS

Nomor Registrasi Migas
AYG - 07981/0841/2020

Date : September 29, 2020

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Website : www.hitestlab.com

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Laboratorium Penguji
LP - 422 - IDN

Testing Report

(This Report is issued subjected to the term & conditions set out below)

Customer	: **PT. Hanazono Engineering Indonesia**	**Job No**	: B20625
Address	: Jl. Bojonegara No. 44 Kertasana, Serang, Banten 42454	**No.**	: HT/JKT/0920/0329
		Total of Page	: 1 of 2
Reference Code	: ASME Sect. IX : 2019	**Date of Received**	: 22 September 2020
Test Method	: ASTM A370-19	**Date of Tested**	: 29 September 2020
Object to be tested	: (as received)	**PO No**	: **PO-E001-HTT-TOL-004**
		Project Name	: --
		Sample Marking	: 9. HEI 3

One welded stainless steel plate joint test sample, size: 10 mm thickness, material spec: A 240-304, PQR No. PQR003/HEI/MIGAS/20, welding process: GTAW+SMAW, welding position: 1G, for Procedure Qualification Record Test.

Type of Test : **Reduced Section Tension Test (Transverse Specimen)**
Environment Temp : **25.1°C**

Test Specimen No		**T1**	**T2**
Measured Thickness	**(mm)**	9.87	9.82
Measured Width	**(mm)**	19.61	19.54
Effective Area	**(mm^2)**	193.55	191.88
Ultimate Tensile Load	**(kN)**	107.41	119.16
Ultimate Tensile Strength	**(N/mm^2)**	555	621
Location of Failure		Weld Metal	Weld Metal
Type of Failure		Ductile	Ductile

Testing Machine Used : INSTRON 600 DX,
Model: 600 DX, S/N: S2513, Capacity : 600 kN
Remark : --
Test Conducted By : Canra Latipolia, ST
Witnessed By :

Approved Signatory

PT. Hi-Test Laboratory of Mechanical JKT

Suhadi, ST
Laboratory Manager

PT. Hi-Test
Laboratory of Mechanical Testing
BSD City :
Taman Tekno Blok A2 No. 49
Bumi Serpong Damai (BSD) – Tangerang - Indonesia
Telp : +62 21 75882884; Fax : +62 21 75882885
E-mail : hi-test@hitestlab.com
Website : www.hitestlab.com

ilac-MRA
KAN
KOMITE AKREDITASI NASIONAL
Laboratorium Penguji
LP - 422 - IDN

Testing Report

(This Report is issued subjected to the term & conditions set out below)

Customer	: **PT. Hanazono Engineering Indonesia**	**Job No**	: B20625
Address	: Jl. Bojonegara No. 44 Kertasana, Serang, Banten 42454	**No.**	: HT/JKT/0920/0329
		Total of Page	: 2 of 2
Reference Code	: ASME Sect. IX : 2019	**Date of Received**	: 22 September 2020
Test Method	: ASTM E190-14	**Date of Tested**	: 29 September 2020
Object to be tested	: (as received)	**PO No**	: --
		Project Name	: --
		Sample Marking	: 9. HEI 3

One welded stainless steel plate joint test sample, size: 10 mm thickness, material spec: A 240-304, PQR No. PQR003/HEI/MIGAS/20, welding process: GTAW+SMAW, welding position: 1G, for Procedure Qualification Record Test.

Type of Test : **Bending Test (Transverse Specimen)**

Test Temperature	:	**25.1°C**					
Test Weld Ment Thickness	:	10	mm	**Test Specimen Width**	:	38	mm
Former Diameter	:	40	mm	**Bend Angle**	:	180	Degree
Shoulder Distance	:	63.2	mm				

Specimen No	Type of Bend	Observation	Result
FB1	Face Bend	No Open Discontinuity was Observed	Accepted
FB2	Face Bend	No Open Discontinuity was Observed	Accepted
RB1	Root Bend	No Open Discontinuity was Observed	Accepted
RB2	Root Bend	No Open Discontinuity was Observed	Accepted

Testing Machine Used : MOTOR PUMP BENDING TEST MACHINE,
Model : Daventry England, S/N : DG 8881, Capacity : 700 Bar

Remark : --

Test Conducted By : Canra Latipolia, ST

Witnessed By :

Approved Signatory

PT. Hi-Test JKT Laboratory of Mechanical

Suhadi, ST
Laboratory Manager

PT. RIRE SANJAYA SAKTI
Rope Access & NDT Services
Head Office : Jl. Wibawa Mukti II Kav.1 - Jati Asih
Bekasi 17423 - Jawa Barat, Indonesia
Phone : +62-21 8243 5561 / 8241 5794
Fax : +62-21 8243 5168
Email : admin@rss.co.id, Website : www.rss.co.id

RADIOGRAPHY EXAMINATION REPORT

Client : PT. HANAZONO ENGINEERING INDONESIA	Job No. : PQR	Report No. : 001/RT/HEI/IX/20
Contractor : -	Work Order / Request No. : -	Shooting Date : 18-09-2020
Project : PQR	Location : W/S - Cilegon	Date of Report : 19-09-2020

Radiographic Procedure : RSS/RT-ASME/003	Radiation Source : IR-192	Screen Type : LEAD	SFD : 381 mm / Inch	RT Tech : DWSI ☐ DWDI ☐ SWSI ☒
Application Code : ASME VIII	F/S Source Size : 2.7 x 2.5 mm	Back./Front Thick : 0.125 mm	SSOF: 48 mm / Inch	IQI Type : S.Side ☒ F.Side ☐
Material Specification : A 240.304/ A 240.304, A 240.304/A 516 GR 70 N, A 516 GR 70N/ A 516 GR 70N, A 36/ A 36	Activity : 30 Ci	Double ☐ Single Load ☒	SOD : 333 mm / Inch	Sensitivity : Wl. No.9 F. D: 2 - 4
	Exp. Time : 20 Min./Sec	Film type : AGFA D7	Sensitivity : ASTM 1B	Unsharp Geo : 0.5 mm

Identification	Joint No.	Material Size Thick	FILM SEQUENCE – Location Marker 4"X10"	4"X15"	7"X17"	Welder Stamp	Surface Indication	Crack	Incomplete Penetration	Incomplete Fusion	Slag Inclusion	Slag Lines	Concavity	Brun Though	Under Cut	Gas and Worm Hole	Porosity	Others	Sensitivity	Range Density	Judgment	Remarks
PQR/001/HEI/MIGAS/20	-	Thk 45 mm		A-B		W:													9	2.8-3.3	ACC	
PQR/002/HEI/MIGAS/20	-	Thk 10 mm		A-B		W:													9	2.8-3.2	ACC	
PQR/003/HEI/MIGAS/20	-	Thk 10 mm		A-B		W:													9	2.9-3.3	ACC	
PQR/004/HEI/MIGAS/20	-	Thk 22 mm		A-B		W:													9	2.7-3.3	ACC	
PQR/005/HEI/MIGAS/20	-	Thk 10 mm		A-B		W:													9	2.6-3.0	ACC	
PQR/006/HEI/MIGAS/20	-	Thk 10 mm		A-B		W:													9	2.7-3.1	ACC	
PQR/007/HEI/MIGAS/20	-	Thk 22 mm		A-B		W:													9	2.9-3.5	ACC	

Technician:	Radiographer:	QA/QC Approved :	Authorised Inspector :	Customer Rep. :
Total Welds/Film Used : 7 Joints (4" x 10"): Sheets (4" x 15"): 7 Sheets (7" x 17"): Sheets Comments :	NDE Level : II Date : 31-08-2019 TEGUH. P.	Date : 20/09/20	Date :	Date :

BAHRU STAINLESS

ISSUE DATE 2017-08-26

INSPECTION CERTIFICATE 3.1

ACCORDING TO EN 10204 CERTIFICATE NO 152121 Rev 1

MANUFACTURER'S MARK	BHS	INSPECTOR'S STAMP	BHS435	MELTING PROCESS	E/AOD

CUSTOMER:

PT PARADISE PERKASA
JL PANGERAN JAYAKARTA 66 KOMPLEK PESONA
JAYAKARTA LESTARI,
BLOK B 6 MANGGA DUA SELATAN, SAWAH
BESAR JAKARTA PUSAT,
DKI JAKARTA, 10730

Indonesia

ORDER No.	ITEM No.	DELIVERY NOTE No.
BE05338	11	DEL044196

CUSTOMER ORDER No. 2117100086

REQUIREMENTS

SPECIFICATIONS	MATERIAL CODE	
ASTM A240 / A240M-15a	304L	304
ASME BPVC-IIA SA240 / SA240M-2013	304L	304

CASE

BPC1031756 [1150 kg]
BPC1031757 [2112 kg]
BPC1031758 [2110 kg]

Item No. : ....
CERTIFIED TRUE COPY
Signature :
PT. PARADISE PERKASA

TOLERANCE: ASTM/ASME

KURZNAME

PRODUCT: No. 1 Finish Hot rolled annealed and pickled

HEAT No.: 410812

DIMENSIONS: 10 mm X 1220 mm X 2440 mm QUANTITY 25 MASS 2928 Kg MATERIAL No.: A0038966

CHEMICAL COMPOSITION (%)

	C	S	P	Mn	Si	Cr	Ni	N					
Min						17.5	8.0						
Max	0.030	0.030	0.045	2.00	0.75	19.5	10.6	0.10					
Actual	0.019	0.001	0.033	1.72	0.50	18.1	8.1	0.09					

MECHANICAL PROPERTIES

TEMPERATURE	DIRECTION	POSITION	Rm MPa	Rp0.2 MPa	A50 %	HRBW HRBW					
Ambient	Transverse	Requirement Min	515	205	40						
		Max				92					
Ambient	Transverse	Head	647	316	49	85					
		Tail				88					

INTERGRANULAR CORROSION	
SPECIFICATION	RESULT
ASTM A262 Practice E	PASS

This material is free from mercury contamination.
The radiation level exhibited by this material is not greater than the normal background level.
This document is issued without alteration of results and may only be reproduced in full.

Tests to verify batch and quality have been made. Verwechslungsprüfung wurde durchgeführt.
Visual and dimensional control: no exceptions. Besichtigungen und Abmessung: ohne Beanstandung.
The delivery is in accordance with the order. Die Lieferung entspricht den Bestellbedingungen.
This material meets the Hardness requirement of Nace MR-0175 & Nace MR-0103.
Material has been PMI Tested.

Rm = Tensile strength (UTS) | Rp0.2 = Yield/proof strength at 0.2% strain | Rp1.0 = Yield/proof strength at 1.0% strain | A5 = Elongation with gage length 5.65*Sqrt(cross-sectional area) | A5 = Elongation with gage length 50 mm | HRBW = Rockwell hardness B scale

Bahru Stainless Sdn Bhd is certified with ISO 9001 & ISO 14001.

BAHRU STAINLESS SDN BHD IS MEMBER OF ACERINOX GROUP

HEAT TREATMENT (SOLUTION ANNEALED)	
Anneal °C	Quench
1050 - 1100	AIR/SPRAY

BAHRU STAINLESS
PTD 4069 (PLO 108), Jalan Rumbia 4
Tanjung Langsat Industrial Complex
81700 Pasir Gudang, Johor, Malaysia

Swin Le Teoh
QC ENGINEER

PT. voestalpine Böhler Welding Asia Pacific

voestalpine Böhler Welding Asia Pacific
Kawasan Industri Jababeka Cikarang
JL Industri Selatan 2 Blok JJ NO. 7-10
17530 Bekasi
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www.voestalpine.com/welding

PT ALLALLOY CAHAYA DYNAWELD
JL. PANTAI INDAH SELATAN KOMP.
KAMAL MUARA, PENJARINGAN
14470 Jakarta Utara
Indonesia

Inspection certificate 3.1

as per : EN 10204
No. : 2020-2047012280-50-20126-025
Rev. 0

PO no.	ACD/AW-N/20/09/0852	of	21.09.2020
Order no.	1042004717		
Delivery note/pos./splitt	2047012280/000000/000050	of	28.09.2020

Product	GTAW rod/wire
Trade name	**BOHLER S EAS 2-IG**
Standard designation	AWS A5.9 : ER308L
	ASME SFA5.9 : ER308L

Dimension	GTAW 2,4 x 1000 mm	118955
Lot no.	20126	77233
Quantity	60,0 KG	JSB2A00W
		0425

Chemical composition in % of the product

C	Si	Mn	P	S	Cr	Mo	Ni	Cu	N	FN WRC				
0,02	0,35	1,78	0,010	0,025	19,81	0,03	10,10	0,03	0,09	9				

Mechanical properties **EN 10204: 2.2**

Tensile test according to : ASTM E8
Specimen preparation according to : AWS B4.0

T	ReL / Rp 0,2 MPa	Rp 1,0 MPa	Rm MPa	A (Lo = 4d) %	Z %	WBH PWHT	Remarks
25°C	≥ 380		≥ 570	≥ 40			

Impact test according to : ASTM E23
Specimen preparation according to : AWS B4.0

T	Impact energy KV / J	Average KV / J	Lateral expansion mm	Shear fracture %	WBH PWHT	Remarks
-196°C		≥ 50				

The product BOHLER S EAS 2-IG meets the requirements of the filler metal specification ASME sec II, part C, AWS A5.9 : ER308L when tested in accordance with that specification.

Town	Date		Authorized representative
Bekasi	05.10.2020	This certificate was issued by DP-equipment and does not require signature.	Miftah Farid

voestalpine
ONE STEP AHEAD.

PT. voestalpine Böhler Welding Asia Pacific

voestalpine Böhler Welding Asia Pacific
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PT ALLALLOY CAHAYA DYNAWELD
JL. PANTAI INDAH SELATAN KOMP.
KAMAL MUARA, PENJARINGAN
14470 Jakarta Utara
Indonesia

Inspection certificate 3.1

as per : EN 10204
No. : 2020-2047011855-10-18614-025
Rev. 0

PO no.	ACD/HR-N/20/06/0515	of	04.06.2020
Order no.	1042004464		
Delivery note/pos./splitt	2047011855/000000/000010	of	10.07.2020

Product	covered electrode
Trade name	**BOHLER FOX S 308L-16**
Standard designation	EN ISO 3581-A : E 19 9 L R 3 2
	AWS A5.4 : E308L-16

Dimension	SMAW 3,25 x 350 mm	118955
Lot no.	18614	82726 JSB2A00E
Quantity	405,9 KG	0425

Chemical composition in % of the weld metal

C	Si	Mn	P	S	Cr	Mo	Ni	Cu	N					
0,02	0,67	0,52	0,009	0,008	19,03	0,03	9,91	0,06	0,08					

Mechanical properties **ASME II/Sched.F**

Tensile test according to : ASTM E8
Specimen preparation according to : AWS B4.0

T	ReL / Rp 0,2 MPa	Rp 1,0 MPa	Rm MPa	A (Lo = 4d) %	Z %	WBH PWHT	Remarks
25°C	≥ 320		≥ 520	≥ 35		AW	

Impact test according to : ASTM E23
Specimen preparation according to : AWS B4.0

T	Impact energy KV / J	Average KV / J	Lateral expansion mm	Shear fracture %	WBH PWHT	Remarks
-120°C		≥ 30			AW	

The product BOHLER FOX S 308L-16 meets the requirements of the filler metal specification ASME sec II, part C, AWS A5.4 : E308L-16 when tested in accordance with that specification.

Town	Date		Authorized representative
Bekasi	27.07.2020	This certificate was issued by DP-equipment and does not require signature.	Miftah Farid

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PT. HANAZONO Engineering Indonesia
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Office & Work Shop Address: Jl. Raya Bojonegara - Serdang RT/RW. 001/001 No.44
Desa Kertasana, Kec. Bojonegara, Kab. Serang, Banten - Indonesia 42454
Phone : +62-254-7850344/5/6, Fax : +62-254-785037

WELDING PROCEDURE SPECIFICATION (WPS)

In accordance with
Section IX, ASME Boiler and Pressure Vessel Code

Organization Name: PT. HANAZONO ENGINEERING INDONESIA By: Quality Department
Welding Procedure Specification No. 005/HEI/MIGAS/20 Date 01/10/2020 Supporting PQR No.(s) 005HEI/MIGAS/20
Revision No. 0 Date 01/10/2020

Welding Process (es) GTAW & SMAW Type (s) Manual
(Automatic, Manual, Machine or Semi-Auto)

JOINT (QW - 402) **Details**

Joint Design: Single Vee or Any
Root Spacing: 0 ~ 3 mm
Backing: With / Without
Backing Material (Type): Air (GTAW) / Base Nor Weld Metal (GTAW / SMAW)

See Joint Details

Sketches, production Drawings, Weld Symbols or Written Description Should show the general arrangement of the parts to be welded. Where applicable, the root spacing and the details of weld groove maybe specified.

Sketches may be attached to illustrate joint design, weld layers, and bead sequence (e.g., for toughness procedures, for multiple process procedures, etc.)

***BASE METALS (QW - 403)**

P. No. 1 Group No. 2 to P. No. 1 Group No. 2
OR
Specification type, grade, or UNS -
to Specification type, grade, or UNS -
OR
Chem. Analysis and Mech. Prop -
to Chem. Analysis and Mech. Prop -
Thickness Range :
Base Metal : Groove 9.73 ~ 15.73 mm (Impact Limit), 1.5 ~ 19.46 mm (W/O Impact) Fillet All
Maximum Pass Thickness ≤½ in. (13mm) (Yes) All (No) -
Other

***FILLER METALS (QW - 404)**

	1 GTAW	2 SMAW
Spec. No. (SFA)	5.18	5.1
AWS No. (Class)	ER70S-6	E7018-1H4R
F - No.	6	4
A - No.	1	1
Size of Filler Metals	Ø 1.6 mm ~ 2.4 mm	Ø 3.2 ~ 4.0 mm
Weld Metal		
Deposit Thickness:		
Groove	Max. 6 mm	Max. 13.46 mm
Fillet	All	All
Electrode Flux (Class)	N/A	N/A
Flux Type	N/A	Low Hydrogen
Flux Trade Name	N/A	N/A
Consumable Insert	N/A	N/A

Other: Manufacturer : BOHLER
Electrode Name : **Bohler S EMK 6 & Fox S EV 50-1**

*Each base metal-filler metal combination should be specified individually.

Nomor Registrasi Migas
AYG - 07901 / 0045 / 2020

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WELDING PROCEDURE SPECIFICATION (WPS)

In accordance with
Section IX, ASME Boiler and Pressure Vessel Code

Welding Procedure Specification No. : 005/HEI/MIGAS/20 Rev. 0

POISITIONS (QW- 405)

Position(s) of Grove: All
Welding Progression: All
Position(s) of Fillet: All

POSTWELD HEAT TREATMENT (QW - 407)

Temperature Range: 625°C ± 25°C
Time Range: Holding Time 1 h/25 mm (1 hr/in.)
(15 min min.) Heating / Cooling rate max 315°C

PREHEAT (QW - 406)

Preheat Temp. Min.: 32 °C
Interpass Temp. Max.: 240 °C
Preheat Maintenance: N/A *)
Other

(Continuous or special heating, where applicable, should be specified)

GAS (QW - 408)

	Persent Composition		
	Gas (es)	Mixture	Flow Rate
Shielding	Argon	99,99%	7 - 15 LPM
Trailing	-	-	-
Backing	-	-	-
Other	-	-	-

ELECTRICAL CHARACTERISTIC (QW - 409)

Weld Pass(es)	Process	Filler Metal		Current Type & Polarity	Amps. (Range)	Wire Feed Speed (Range)	Energy or Power (Range)	Volts (Range)	Travel Speed (Range)	Other (e.g., Remarks, Comments, Hot Wire Addition, Technique, Process Torch Angle, etc.)
		Class	Dia.							
Root & Hot	GTAW	ER70S-6	1.6 ~2.4	DCEN	50 - 150	-	-	9 - 18	11 - 65	-
Fill & Capping	SMAW	E7018-1H4R	3.2 / 4.0	DCEP	80 - 190	-	-	19 - 28	38 - 140	-

Amps and volts, or power or energy range, should be specified for each electrode size, position, and thickness, etc.

Pulsing Current: N/A
Heat Input (max.): 2.5 J
Tungsten Electrode Size and Type: 1.6 ~ 2.4mm & 2% Thoriated (EWTh-2)
(Pure Tungsten, 2% Thoriated, etc.)

Mode of Metal Transfer for GMAW (FCAW): N/A
(Spray Arc, Short-Circuiting Arc, etc.)

Other: N/A

TECHNIQUE (QW - 410)

String or Weave Bead: Max. stringer or weaver within 2.5 time diameter of electrodes
Orifice, Nozzle, or Gas Cup Size: 5, 6, or 7
Initial and Interpass Cleaning (Brushing, Grinding, etc.): Brushing & Grinding
Method of Back Gouging: Back Grinding / Back Gouging
Oscillation: N/A
Contact Tube to Work Distance: 12 ~ 19mm (GTAW)
Multiple or Single Pass (Per Side): Multiple
Multiple or Single electrode: Single
Electrode Spacing: N/A
Peening: N/A
Other: Welds shall be cleaned between each pass. When completed, remove all slag & projection with grinding & Brushing

Nomor Registrasi Migas
AYG - 07901 / 0044 / 2020

WELDING INSPECTOR

PT. HANAZONO Engineering Indonesia
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Office & Work Shop Address: Jl. Raya Bojonegara - Serdang RT/RW. 001/001 No.44
Desa Kertasana, Kec. Bojonegara, Kab. Serang, Banten - Indonesia 42454
Phone : +62-254-7850344/5/6, Fax : +62-254-785037

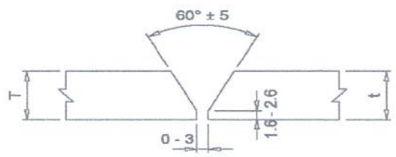
WELDING PROCEDURE SPECIFICATION (WPS)
In accordance with
Section IX, ASME Boiler and Pressure Vessel Code

Welding Procedure Specification No. : 005/HEI/MIGAS/20 Rev. 0

JOINT DETAILS

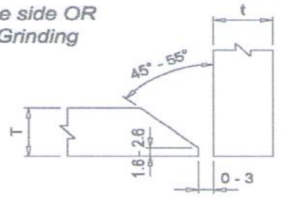
SINGLE VEE GROOVE
T = t

Welded from one side



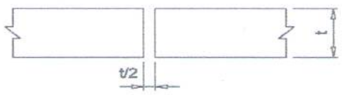
SINGLE BEVEL - CORNER JOINT
T = t

Welded from one side OR both side Back Grinding



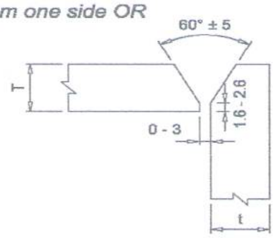
SQUARE BUTT

Welded from BOTH SIDES, T = 6 mm Max
Root gap, 0 - t/2



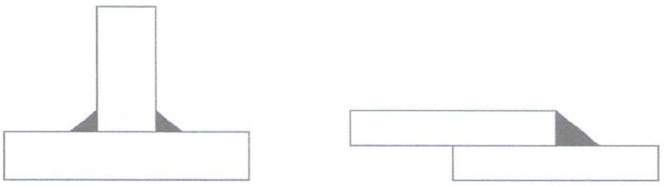
SINGLE VEE GROOVE
T = t

Welded from one side OR both side



SINGLE OR DOUBLE FILLET

UNLIMITED



For Non-Impact tested applications only, the following AWS/SFA clasification can be used with this procedure :
GTAW : ER70S-6 / 5.18 & SMAW : E7018-1H4R / 5.1

Weld Joint description shown are not inclusive of all of those found on job site. Weld joint design reference in an engineering specification or design shall take precedence over weld joint shown in this WPS.

Organization Prepared by,	Verified by
PT. HANAZONO ENG. INDONESIA	**MINISTRY OF ENERGY AND MINERAL RESOURCES**
	DIRJEN MIGAS
	Nomor Registrasi Migas
	AYG - 07981 /0045/2020
Date : October 1, 2020	*Date : October 1, 2020*

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Office & Work Shop Address: Jl. Raya Bojonegara - Serdang RT/RW. 001/001 No.44
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PROCEDURE QUALIFICATION RECORD (PQR)

Record Actual Conditions Used to Weld Test Coupon

Organization Name **PT. HANAZONO ENGINEERING INDONESIA**

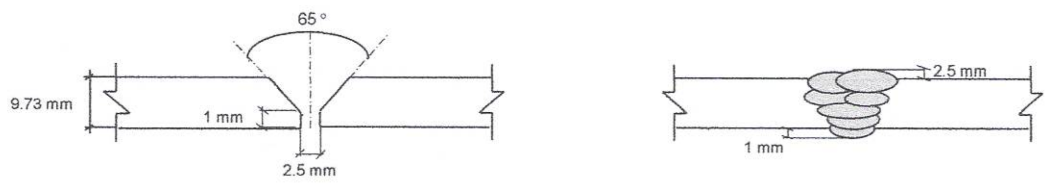
Procedure Qualification Record No. 005/HEI/MIGAS/20 Date 29/09/2020

WPS No. 005/HEI/MIGAS/20

Welding Process (es) GTAW & SMAW

Types (Manual, Automatic, Semi-Automatic Manual

JOINTS (QW - 402)



Groove Design of Test Coupon

(For combination qualifications, the deposited weld metal thickness shall be recorded for each filler metal and process used.)

BASE METAL (QW - 403)

Material Spec. A516

Type or Grade, or UNS Number Gr. 70N

P-No. 1 Group No. 2 to P-No. 1 Group No. 2

Thickness of Test Coupon 9.73 mm

Diameter of Test Coupon N/A

Maximum Pass Thickness ≤½ in. (13mm)

Other

FILLER METAL (QW - 404)

SFA Specification	5.18	5.1
AWS Specification	ER70S-6	E7018-1H4R
Filler Metal F-No.	6	4
Weld Metal Analysis A-No.	1	1
Size of Filler Metal	Ø2.4 mm	Ø3.2 mm
Filler Metal Product Form	Solid Bare	Flux Coated
Supplemental Filler Metal	N/A	N/A
Electrode Flux Classification	N/A	N/A
Flux Type	N/A	Low Hydrogen
Flux Trade Name	N/A	N/A
Weld Metal Thickness	3 mm	6.73 mm
Other	BOHLER S EMK 6	FOX S EV 50-1

POSITION (QW - 405)

Position(s) of Groove 1G

Weld Progression (Uphill, Downhill) N/A

Other N/A

PREHEAT (QW - 406)

Preheat Temperature 32°C

Interpass Temperature 240°C

Other N/A

POSTWELD HEAT TREATMENT (QW - 407)

Temperature Range 625°C

Time Holding at 1 Hr for 25.4mm Thk.

Others Heating & Cooling rate (280°C) per hours

GAS (QW - 408)

	Persent Composition		
	Gas (es)	Mixture	Flow Rate
Shielding	Argon	99,99%	12 LPM
Trailing	-	-	-
Backing	-	-	-

ELECTRICAL CHARACTERISTIC (QW - 409)

Current DCEN (GTAW) & DCEP (SMAW)

Polarity *See Table Welding Parameter*

Amps *See Table Welding Parameter*

Waveform Control N/A

Power or Energy *See Table Welding Parameter*

Arc Time 5-10 Minutes / Pass

Weld Bead Length 4 mm (GTAW) & 5 mm (SMAW)

Tungsten Electrode Size 2.4mm & 2% Thoriated (EWTh-2)

Mode of Metal Transfer for GMAW (FCAW) N/A

Heat Input *See Table Welding Parameter*

Other N/A

TECHINQUE (QW - 410)

Travel Speed *See Table Welding Parameter*

String or Weave Bead String & Weave Bead

Osciliation N/A

Multipass or Single Pass (Per Side) Single & Multipass

Single or Multiple Electrodes Single

Other N/A

Nomor Registrasi Migas
AYG - 07981/0845/2020

Office & Work Shop Address: Jl. Raya Bojonegara - Serdang RT/RW. 001/001 No.44
Desa Kertasana, Kec. Bojonegara, Kab. Serang, Banten - Indonesia 42454
Phone : +62-254-7850344/5/6, Fax : +62-254-785037

PROCEDURE QUALIFICATION RECORD (PQR)

Record Actual Conditions Used to Weld Test Coupon

Procedure Qualification Record No. : 005/HEI/MIGAS/20 Rev. 0

WELDING PARAMETER

Weld No.	Welding Process	Filer Metal		Type Polarity	Ampere	Volt	Travel Speed Range (mm/min)	Heat Input (J/mm)
		Class	Dia.					
1	GTAW	ER70S-6	2.4 mm	DCEN	150	18	65	2,5
2					160	18	87	2,0
3	SMAW	E7018-1H4R	3.2 mm	DCEP	110	22	72	2,0
4					123	22	75	2,2
5					123	22	82	2,0
6					120	22	86	1,8
7					123	22	90	1,8

TENSILE TEST (QW - 160)

Specimen No.	Width (mm)	Thickness (mm)	Area (mm^2)	Ultimate Total Load (kN)	Ultimate Unit Stress (N/mm^2)	Type Failure & Location
T1	19,54	9,71	189,73	108,34	571	Fracture on base metal
T2	19,51	9,75	190,22	108,05	568	Fracture on base metal

GUIDE BEND TESTS (QW - 160)

Type and Figure No.	Result
SB1 - QW 462.2	**No Open Discontinuity**
SB2 - QW 462.2	
SB3 - QW 462.2	
SB4 - QW 462.2	

TOUGHNESS TESTS (QW - 170)

Specimen No.	Notch Location	Specimen Size	Test Temp. (°C)	Toughness Values		Drop Weight Break (Y/N)
				% Shear	Mils (in.) or mm	
1	WCL	10 x 10 x 55	- 46	218		213
2				197		
3				225		
1	FL 1	10 x 10 x 55	- 46	96		94
2				84		
3				103		
1	FL 2	10 x 10 x 55	- 46	78		71
2				63		
3				72		

Comments

Nomor Registrasi Migas
AYG - 07981/08ur/2020

WELDING INSPECTOR IM MIGAS

PT. HANAZONO Engineering Indonesia
We are always partner with you

Office & Work Shop Address: Jl. Raya Bojonegara - Serdang RT/RW. 001/001 No.44
Desa Kertasana, Kec. Bojonegara, Kab. Serang, Banten - Indonesia 42454
Phone : +62-254-7850344/5/6, Fax : +62-254-785037

PROCEDURE QUALIFICATION RECORD (PQR)

Record Actual Conditions Used to Weld Test Coupon

Procedure Qualification Record No. : 005/HEI/MIGAS/20 Rev. 0

FILLET-WELD TEST (QW - 180)

Result - Satisfactory : Yes - No - Penetration into Parent Metal : Yes - No -

Macro - Result None

HARDNESS TESTS

Test No	Test Location	Vickers Hardness Value HV 10, Kgf/mm^2 12^{oo}			Remarks
		Line 1	Line 2	Line 3	
1	HAZ 1	170	169	167	
2		175	173	171	
3		187	176	174	
4	Weld Metal	179	168	177	
5		183	171	172	
6		187	180	175	
7	HAZ 2	218	175	181	
8		212	172	178	
9		205	168	175	

Other Tests

Type of Test N/A

Deposit Analysis N/A

Other Radiography examination, Result : ACC, Report No. : **001/RT/HEI/IX/20** by PT. Rire Sanjaya Sakti

Welder's Name **ASMURI** Clock No. - Stamp No. **W - 01**

Tests conducted by : **PT. HI-TEST** Laboratory Test No. : **HT/JKT/0920/0331**

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 Boiler and Pressure Vessel Code.

Organization Prepared by,
PT. HANAZONO ENG. INDONESIA

Date : September 29, 2020

Verified by
MINISTRY OF ENERGY AND MINERAL RESOURCES
DIRJEN MIGAS

Nomor Registrasi Migas
AYG - 07981/6845/2020

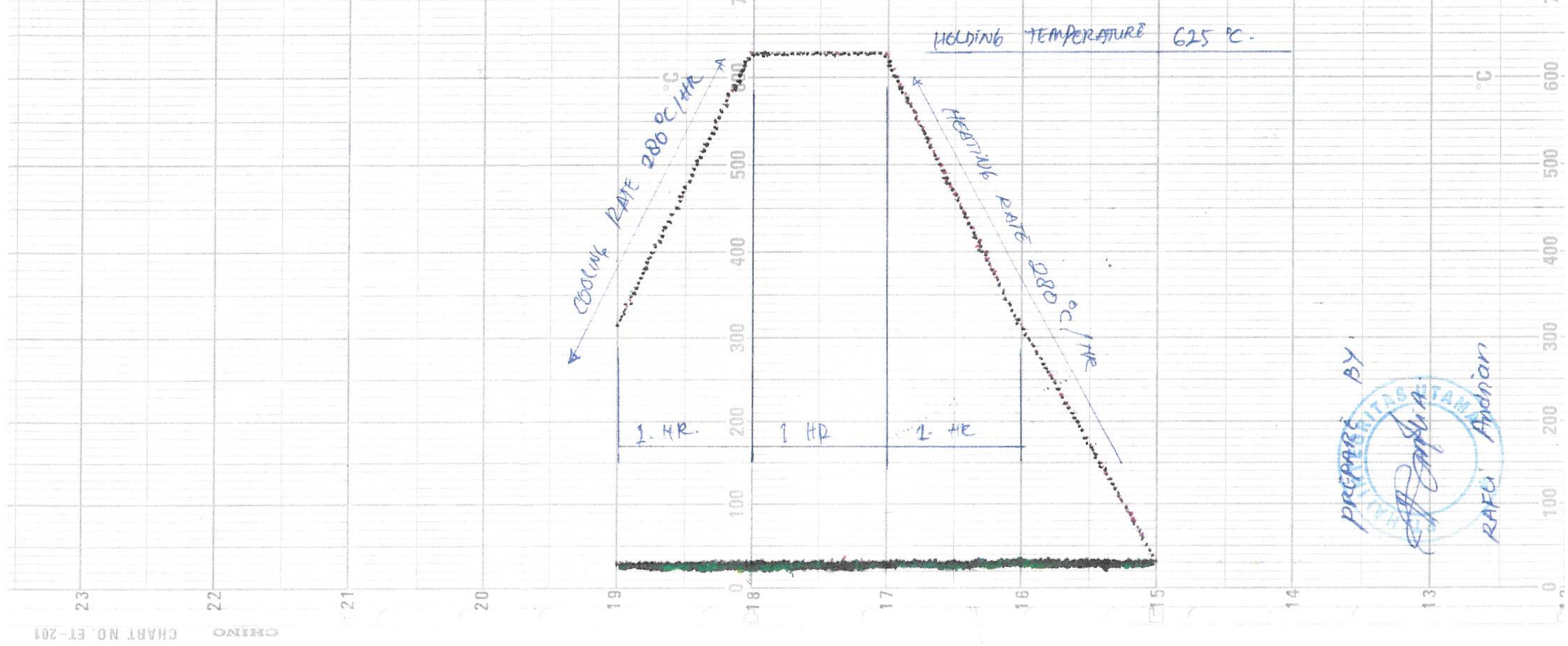
Date : September 29, 2020

* DATE OF TEST - 19. 09. 2012.
* REPORT NO
* REC NO : EH - 100-12.
* CHART SPEED = 25. mm/HR.

* DRAWING. NO :
* PQR 004 / HEI / MIGASL 20
* PQR 005 / HEI / MIGAN / 20.

J-1. THK 22. mm.
J-2. THK 10. mm.

T/C. 1. RED.
T/C. 2. BLACK.



PREPARE BY
RAFLI Andrian

PT. Hi-Test
Laboratory of Mechanical Testing
BSD City :
Taman Tekno Blok A2 No. 49
Bumi Serpong Damai (BSD) – Tangerang - Indonesia
Telp : +62 21 75882884; Fax : +62 21 75882885
E-mail : hi-test@hitestlab.com
Website : www.hitestlab.com

ilac-MRA

KAN
KOMITE AKREDITASI NASIONAL
Laboratorium Penguji
LP - 422 - IDN

Testing Report

(This Report is issued subjected to the term & conditions set out below)

Customer	: **PT. Hanazono Engineering Indonesia**	**Job No**	: B20625
Address	: Jl. Bojonegara No. 44 Kertasana, Serang, Banten 42454	**No.**	: HT/JKT/0920/0331
		Total of Page	: 1 of 4
Reference Code	: ASME Sect. IX : 2019	**Date of Received**	: 22 September 2020
Test Method	: ASTM A370-19	**Date of Tested**	: 29 September 2020
Object to be tested	: (as received)	**PO No**	: **PO-E001-HTT-TOL-004**
		Project Name	: --
		Sample Marking	: 9. HEI 5

One welded carbon steel plate joint test sample, size: 10 mm thickness, material spec: A 516 Gr. 70N, PQR No. PQR005/HEI/MIGAS/20, welding process: GTAW+SMAW, welding position: 1G, for Procedure Qualification Record Test.

Type of Test : **Reduced Section Tension Test (Transverse Specimen)**
Environment Temp : **25.1°C**

Test Specimen No		T1	T2
Measured Thickness	**(mm)**	9.71	9.75
Measured Width	**(mm)**	19.54	19.51
Effective Area	**(mm^2)**	189.73	190.22
Ultimate Tensile Load	**(kN)**	108.39	107.96
Ultimate Tensile Strength	**(N/mm^2)**	571	568
Location of Failure		Base Metal	Base Metal
Type of Failure		Ductile	Ductile

Testing Machine Used : INSTRON 600 DX,
Model: 600 DX, S/N: S2513, Capacity : 600 kN
Remark : --
Test Conducted By : Canra Latipolia, ST
Witnessed By :

Approved Signatory

PT. Hi-Test Laboratory of Mechanical Testing JKT

Suhadi, ST
Laboratory Manager

PT. Hi-Test
Laboratory of Mechanical Testing
BSD City :
Taman Tekno Blok A2 No. 49
Bumi Serpong Damai (BSD) – Tangerang - Indonesia
Telp : +62 21 75882884; Fax : +62 21 75882885
E-mail : hi-test@hitestlab.com
Website : www.hitestlab.com

ilac-MRA

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Address	: Jl. Bojonegara No. 44 Kertasana, Serang, Banten 42454	**No.**	: HT/JKT/0920/0331
		Total of Page	: 2 of 4
Reference Code	: ASME Sect. IX : 2019	**Date of Received**	: 22 September 2020
Test Method	: ASTM E190-14	**Date of Tested**	: 29 September 2020
Object to be tested	: (as received)	**PO No**	: **PO-E001-HTT-TOL-004**
		Project Name	: --
		Sample Marking	: 9. HEI 5

One welded carbon steel plate joint test sample, size: 10 mm thickness, material spec: A 516 Gr. 70N, PQR No. PQR005/HEI/MIGAS/20, welding process: GTAW+SMAW, welding position: 1G, for Procedure Qualification Record Test.

Type of Test : **Bending Test (Transverse Specimen)**

Test Temperature	:	**25.1°C**				
Test Weld Ment Thickness	:	10 mm	**Test Specimen Width**	:	38	mm
Former Diameter	:	40 mm	**Bend Angle**	:	180	Degree
Shoulder Distance	:	63.2 mm				

Specimen No	Type of Bend	Observation	Result
FB1	Face Bend	No Open Discontinuity was Observed	Accepted
FB2	Face Bend	No Open Discontinuity was Observed	Accepted
RB1	Root Bend	No Open Discontinuity was Observed	Accepted
RB2	Root Bend	No Open Discontinuity was Observed	Accepted

Testing Machine Used : MOTOR PUMP BENDING TEST MACHINE,
Model : Daventry England, S/N : DG 8881, Capacity : 700 Bar

Remark : --
Test Conducted By : Canra Latipolia, ST
Witnessed By :

Approved Signatory

PT. Hi-Test JKT Laboratory of Mechanical Testing

Suhadi, ST
Laboratory Manager

PT. Hi-Test
Laboratory of Mechanical Testing
BSD City :
Taman Tekno Blok A2 No. 49
Bumi Serpong Damai (BSD) – Tangerang - Indonesia
Telp : +62 21 75882884; Fax : +62 21 75882885
E-mail : hi-test@hitestlab.com
Website : www.hitestlab.com

KOMITE AKREDITASI NASIONAL
Laboratorium Penguji
LP - 422 - IDN

Testing Report

(This Report is issued subjected to the term & conditions set out below)

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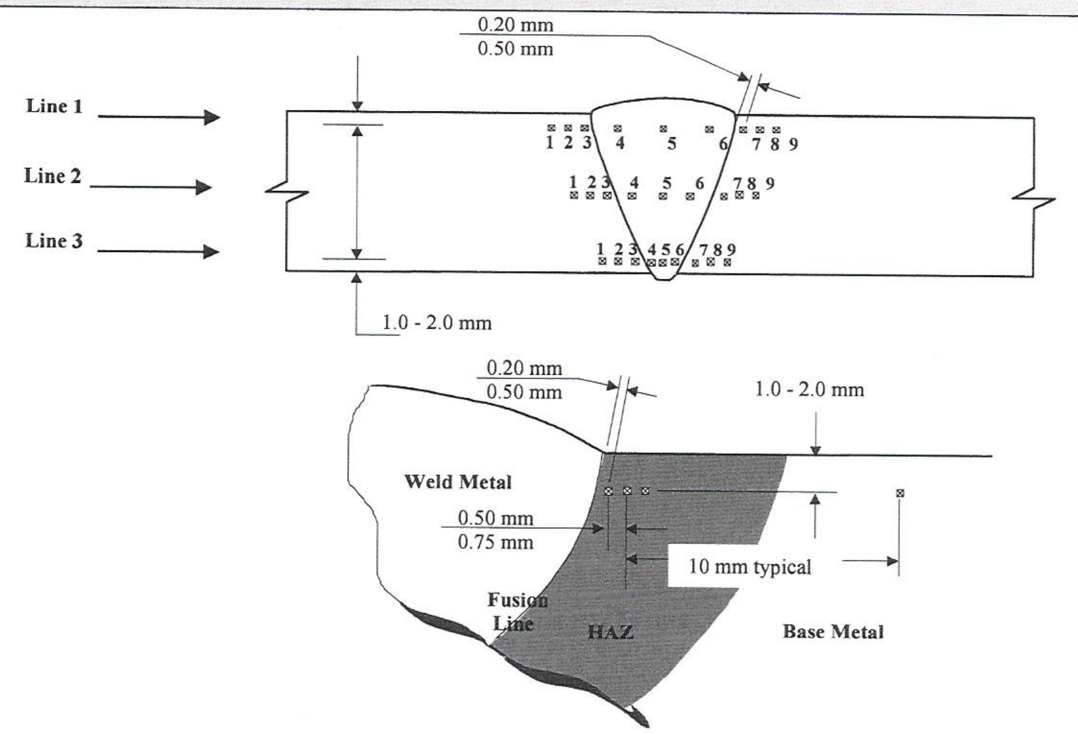
Address	: Jl. Bojonegara No. 44 Kertasana, Serang, Banten 42454	**No.**	: HT/JKT/0920/0331
		Total of Page	: 3 of 4
Reference Code	: ASME Sect. IX : 2019	**Date of Received**	: 22 September 2020
Test Method	: ASTM E92-17	**Date of Tested**	: 29 September 2020
Object to be tested	: (as received)	**PO No**	: **PO-E001-HTT-TOL-004**
		Project Name	: --
		Sample Marking	: 9. HEI 5

One welded carbon steel plate joint test sample, size: 10 mm thickness, material spec: A 516 Gr. 70N, PQR No. PQR005/HEI/MIGAS/20, welding process: GTAW+SMAW, welding position: 1G, for Procedure Qualification Record Test.

Type of Test : **Vickers Hardness Number (HV), Load Test 10 Kgf**

Sketch



Approved Signatory

Suhadi, ST
Laboratory Manager

Form No: HT/QM-F/HARDNESS-SKETCH/3 Rev.0 *Date of Issued 06/01/2014*

The results reported herein have been performed in accordance with the laboratory's terms of accreditation under Komite Akreditasi Nasional (ISO/IEC 17025:2005)

PT. Hi-Test
Laboratory of Mechanical Testing
BSD City :
Taman Tekno Blok A2 No. 49
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E-mail : hi-test@hitestlab.com
Website : www.hitestlab.com

KOMITE AKREDITASI NASIONAL
Laboratorium Penguji
LP - 422 - IDN

Testing Report

(This Report is issued subjected to the term & conditions set out below)

Customer	:	**PT. Hanazono Engineering Indonesia**	**Job No**	:	B20625
Address	:	Jl. Bojonegara No. 44 Kertasana, Serang, Banten 42454	**No.**	:	HT/JKT/0920/0331
			Total of Page	:	3 of 4
Reference Code	:	ASME Sect. IX : 2017	**Date of Received**	:	22 September 2020
Test Method	:	ASTM E23-18	**Date of Tested**	:	29 September 2020
Object to be tested	:	(as received)	**PO No.**	:	**PO-E001-HTT-TOL-004**
			Project Name	:	--
			Sample Marking	:	9. HEI 5

One welded carbon steel plate joint test sample, size: 10 mm thickness, material spec: A 516 Gr. 70N, PQR No. PQR005/HEI/MIGAS/20, welding process: SMAW+SAW, welding position: 1G, for Procedure Qualification Record Test.

Type of Test : **Charpy Impact Test (Welding Joint Section)**
Environment Temp : **25.1°C**

V-Notch Position	Specimen Size (mm)	Test Temp. (°C)	Impact Value Specimen (J)			Average (J)
			1	2	3	
WCL	10x10x55	-46	218	197	225	213
FL1	10x10x55	-46	96	84	103	94
FL2	10x10x55	-46	78	63	72	71

Testing Machine Used : Zwick Roell RKP 450 – SN : 215240
Remark : --
Test Conducted By : Sukmahadi, ST
Witnessed By :

Approved Signatory

PT. Hi-Test JKT Laboratory of Mechanical Testing

Suhadi, ST
Laboratory Manager

Form No: HT/QM-F/CHARPY – MAT/3 Rev.0 *Date of Issued 06/01/2014*
The results reported herein have been performed in accordance with the laboratory's terms of accreditation under Komite Akreditasi Nasional (ISO/IEC 17025:2005)

PT. Hi-Test
Laboratory of Mechanical Testing
BSD City :
Taman Tekno Blok A2 No. 49
Bumi Serpong Damai (BSD) – Tangerang - Indonesia
Telp : +62 21 75882884; Fax : +62 21 75882885
E-mail : hi-test@hitestlab.com
Website : www.hitestlab.com

KAN KOMITE AKREDITASI NASIONAL
Laboratorium Penguji
LP - 422 - IDN

Testing Report

(This Report is issued subjected to the term & conditions set out below)

Customer	: **PT. Hanazono Engineering Indonesia**	**Job No**	: B20625
Address	: Jl. Bojonegara No. 44 Kertasana, Serang, Banten 42454	**No.**	: HT/JKT/0920/0331
		Total of Page	: 4 of 4
Reference Code	: ASME Sect. IX : 2019	**Date of Received**	: 22 September 2020
Test Method	: ASTM E92-17	**Date of Tested**	: 29 September 2020
Object to be tested	: (as received)	**PO No**	: **PO-E001-HTT-TOL-004**
		Project Name	: --
		Sample Marking	: 9. HEI 5

One welded carbon steel plate joint test sample, size: 10 mm thickness, material spec: A 516 Gr. 70N, PQR No. PQR005/HEI/MIGAS/20, welding process: GTAW+SMAW, welding position: 1G, for Procedure Qualification Record Test.

Type of Test : **Vickers Hardness Number (HV), Load Test 10 Kgf**
Specimen No : **1**

Sample Identification	Material Specification	Test Location	Vickers Hardness Number (HV), Test Load Applied 10 Kgf					
			Line 1		Line 2		Line 3	
			No	Result	No	Result	No	Result
PQR No. PQR005/HEI/MIGAS/20	A 516 Gr. 70N	HAZ	1	170	1	169	1	167
			2	175	2	173	2	171
			3	187	3	176	3	174
	Weld Metal		4	179	4	168	4	177
			5	183	5	171	5	172
			6	187	6	180	6	175
	A 516 Gr. 70N	HAZ	7	218	7	175	7	181
			8	212	8	172	8	178
			9	205	9	168	9	175

Testing Machine Used : The Mitutoyo Vickers Hardness Testing Machine, Model HV-113, S/N: 500261112
Remark : *Has been verified using Deutsche Akkreditierungsstelle Standardised Blocks (Identity No: 15634, 15635, 15636)*
Test Conducted By : M. Anjar Rizki, ST
Witnessed By :

Approved Signatory

PT. Hi-Test JKT Laboratory of Mechanical Test

Suhadi, ST
Laboratory Manager

PT. RIRE SANJAYA SAKTI
Rope Access & NDT Services
Head Office : Jl. Wibawa Mukti II Kav.1 - Jati Asih
Bekasi 17423 - Jawa Barat, Indonesia
Phone : +62-21 8243 5561 / 8241 5794
Fax : +62-21 8243 5168
Email : admin@rss.co.id, Website : www.rss.co.id

RADIOGRAPHY EXAMINATION REPORT

Client : PT. HANAZONO ENGINEERING INDONESIA	Job No. : PQR	Report No. : 001/RT/HEI/IX/20
Contractor : -	Work Order / Request No. : -	Shooting Date : 18-09-2020
Project : PQR	Location : W/S - Cilegon	Date of Report : 19-09-2020

Radiographic Procedure : RSS/RT-ASME/003	Radiation Source : IR-192	Screen Type : LEAD	SFD : 381 mm / Inch	RT Tech : DWSI ■ DWDI ■ SWSI ■
Application Code : ASME VIII	F/S Source Size : 2.7 x 2.5 mm	Back / Front Thick : 0.125 mm	SSOF : 48 mm / Inch	IQI Type : S.Side ■ F.Side ■
Material Specification : A 240.304/ A 240.304, A 240.304/A 516 GR 70 N, A 516 GR 70N/ A 516 GR 70N, A 36/ A 36	Activity : 20 Ci	Double ■ Single Load ■	SOD : 333 mm / Inch	Sensitivity : WI. No.9 F.D. 2-4
	Exp. Time : 30 Min./Sec	Film type : AGFA D7	Sensitivity : ASTM 1B	Unsharp Geo : 0.5 mm

Identification	Joint No.	Material Size Thick	Film Sequence – Location Marker 4"X10"	4"X15"	7"X17"	Welder Stamp	Surface Indication	Crack	Incomplete Penetration	Incomplete Fusion	Slag Inclusion	Slag Lines	Concavity	Brun Though	Under Cut	Gas and Worm Hole	Porosity	Others	Sensitivity	Range Density	Judgment	Remarks
PQR/001/HEI/MIGAS/20	-	Thk 45 mm		A-B		W:													9	2.8-3.3	ACC	
PQR/002/HEI/MIGAS/20	-	Thk 10 mm		A-B		W:													9	2.8-3.2	ACC	
PQR/003/HEI/MIGAS/20	-	Thk 10 mm		A-B		W:													9	2.9-3.3	ACC	
PQR/004/HEI/MIGAS/20	-	Thk 22 mm		A-B		W:													9	2.7-3.2	ACC	
PQR/005/HEI/MIGAS/20	-	Thk 10 mm		A-B		W:													9	2.8-3.0	ACC	
PQR/006/HEI/MIGAS/20	-	Thk 10 mm		A-B		W:													9	2.7-3.1	ACC	
PQR/007/HEI/MIGAS/20	-	Thk 22 mm		A-B		W:													9	2.9-3.5	ACC	

Technician:	Radiographer:	QA/QC Approved:	Authorized Inspector:	Customer Rep.:
Total Welds/Film Used : 7 Joints (4" x 10"): Sheets (4" x 15"): 7 Sheets (7" x 17"): Sheets Comments :	NDE Level : II Date : 31-08-2019 TEGUH. P.	Date : 20/09/20	Date :	Date :

ORIGINAL

검 사 증 명 서
MILL TEST CERTIFICATE

동국제강주식회사
DONGKUK STEEL MILL CO., LTD.

주문번호/Order No. : P194500138
발주번호/PO No. :
품명/Commodity : STEEL PLATE
제품규격/Specification : ASTM A516-70N/ASME SA516-70N

고객사/Supplier : JUNGJIN
수요가/Customer : 탑스틸

검사증명서번호/Certificate No. : DP3-2-190606-022-001
발행일자/Date of issue : 2019-06-06

제 품 치 수 Dimension 단위 Unit inch: ", mm: Space	제 품 번 호 Product No	수량 Quantity	중량 Weight Kg	화학성분(%) Chemical Composition T.Al 3	S.Al 3	Ceq 3	B 4	Remarks
10.00*3048*6096 *Specimen No:DP08221216-a, DP08221215-d ** Normalized:910 ˚C,30min	A670179-01,02		2,188		33	398	1	
	Sub Total (20)	3	4,376					
19.00*3048*6096 *Specimen No:DP08266721-a, DP08266721-d ** Normalized:910 ˚C,35min	A673276-01		2,772		40	417	1	
	Sub Total (40)	1	2,772					
22.00*3048*6096 *Specimen No:DP08266525-a, DP08266525-d ** Normalized:910 ˚C,36min	A673334-01		3,209		30	403	1	
	Sub Total (50)	1	3,209					
25.00*3100*6096 *Specimen No:DP08227613-a, DP08227613-d ** Normalized:910 ˚C,45min	A673275-01		3,708		37	424	1	
	Sub Total (60)	1	3,708					

SEWOONG CO., LTD. H. Y. Jeong QUALITY MANAGER

* Tensile Test Direction–Transverse
* Ceq = C+Mn/6+(Ni+Cu)/15+(Cr+Mo+V)/5
* Supply Condition – Normalized
* Chemical Composition Unit : 2–x100, 3–x1000, 4–x10000

We hereby certify that the material has been made by basic oxygen process (Fully killed steel, Fine grain practice) and satisfactorily tested in accordance with above specification requirement called for by the above order. If the amount of Cr, Ni, Cu, Mo, Ti or Si is blank, the heat analysis for that element is less than 0.02% and/or of Nb, V is blank, it is less than 0.008%. * Inspection documents : According to EN 10204 Type 3.1. NACE MR0175 Hardness only.

본 주문품은 상기의 규격용도 외 타용도로 사용시 제품손상 및 안전사고등의 문제가 발생할 수 있으며, 본 검사증명서를 위조 또는 변조시 형사법에 의해 처벌될 수 있습니다.

* Specimen No. : a–Tension, d–Hardness
* Position : T–Top, M–Middle, B–Bottom
* Division : L–Ladle Analysis, P–Product Analysis
* Sub(Sub Size, Real Value, mm) : Blank–Full Size, 1–7.5*10, 2–5.0*10
* GL(Gauge Length, mm) : 1–200, 2–100, 3–80, 4–70, 5–50, 6–5.65√A, 7–5d, 8–4d, 9–8d
* T(S).Al : Total(Soluble) Al *Tr : Trace
* NRL Result : G–No Break, B–Break
* TTP(Through Thickness Position) : 1–Surface, 2–1/4T, 3–1/2T

원본검증 방법 : 동국제강 홈페이지 접속 (www.dongkuk.co.kr) → e비즈니스 클릭(홈페이지 하단) → 검사증명서 원본검증 클릭 → 정보입력후 검색

Surveyor to | Surveyor to | Surveyor to | Surveyor to | Chief of Quality Control Team

Dangjin Works, 25, Godaegongdan 1-gil, Songak-eup, Dangjin-si, Chungcheongnam-do, Republic of Korea/Quality Control Team, TEL. 041-351-4633

DONGKUK STEEL

ORIGINAL

검 사 증 명 서
MILL TEST CERTIFICATE

동국제강주식회사
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주문번호/Order No. : P194500138
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수요가/Customer : 탑스틸

검사증명서번호/Certificate No. : DP3-2-190606-022-001
발행일자/Date of issue : 2019-06-06

제품치수 Dimension 단위 Unit Inch: ", mm: Space	제품번호 Product No	수량 Quantity	중량 Weight kg	제강번호 Heat No	Position	GL	인장시험 Tensile Test YP02 N/mm²	TS N/mm²	EL %	경도시험 Hardness HB	Division	C 2	Si 2	Mn 2	P 3	S 3	Cr 3	Ni 3	Cu 3	Mo 3	Nb 3	Ti 3	V 3	Remarks
10.00*3048*6096 *Specimen No:DP08221216-a, DP08221215-d ** Normalized:910 °C,30min	A670179-01,02		2,188	PK115635	T	1	346	527	25	139	L	16	37	139	18	4	20	10	10	3	2	18	2	
	Sub Total (20)	3	4,376																					
19.00*3048*6096 *Specimen No:DP08266721-a, DP08266721-d ** Normalized:910 °C,35min	A673276-01		2,772	PK696499	T	1	343	531	27	142	L	17	38	144	18	4	20	10	10	5	1	2	2	
	Sub Total (40)	1	2,772																					
22.00*3048*6096 *Specimen No:DP08266525-a, DP08266525-d ** Normalized:910 °C,36min	A673334-01		3,209	PK696496	T	1	365	541	25	147	L	16	37	142	20	3	20	10	10	5	1	2	2	
	Sub Total (50)	1	3,209																					
25.00*3100*6096 *Specimen No:DP08227613-a, DP08227613-d ** Normalized:910 °C,45min	A673275-01		3,708	PK404319	T	1	352	529	27	149	L	15	33	144	14	3	20	140	190	12	1	16	26	
	Sub Total (60)	1	3,708																					

* Tensile Test Direction-Transverse
* Ceq = C+Mn/6+(Ni+Cu)/15+(Cr+Mo+V)/5
* Supply Condition - Normalized
* Chemical Composition Unit : 2-x100, 3-x1000, 4-x10000

We hereby certify that the material has been made by basic oxygen process (Fully killed steel, Fine grain practice) and satisfactorily tested in accordance with above specification requirement called for by the above order. If the amount of Cr, Ni, Cu, Mo, Ti or Si is blank, the heat analysis for that element is less than 0.02% and/or of Nb, V is blank, it is less than 0.008%. * Inspection documents : According to EN 10204 Type 3.1. NACE MR0175 Hardness only.

본 주문품은 상기의 규격용도 외 타용도로 사용시 제품손상 및 안전사고등의 문제가 발생할 수 있으며, 본 검사증명서를 위조 또는 변조시 형사법에 의해 처벌될 수 있습니다.

* Specimen No. : a-Tension, d-Hardness
* Position : T-Top, M-Middle, B-Bottom
* Division : L-Ladle Analysis, P-Product Analysis
* Sub(Sub Size, Real Value, mm) : Blank-Full Size, 1-7.5*10, 2-5.0*10
* GL(Gauge Length, mm) : 1-200, 2-100, 3-80, 4-70, 5-50, 6-5.65√A, 7-5d, 8-4d, 9-8d
* T(S).Al : Total(Soluble) Al *Tr : Trace
* NRL Result : G-No Break, B-Break
* TTP(Through Thickness Position) : 1-Surface, 2-1/4T, 3-1/2T

원본검증 방법 : 동국제강 홈페이지 접속 (www.dongkuk.co.kr) → e비즈니스 클릭(홈페이지 하단) → 검사증명서 원본검증 클릭 → 정보입력후 검색

Surveyor to | Surveyor to | Surveyor to | Surveyor to | Chief of Quality Control Team

Dangjin Works, 25, Godaegongdan 1-gil, Songak-eup, Dangjin-si, Chungcheongnam-do, Republic of Korea/Quality Control Team, TEL. 041-351-4633

PT. voestalpine Böhler Welding Asia Pacific

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PT ALLALLOY CAHAYA DYNAWELD
JL. PANTAI INDAH SELATAN KOMP.
KAMAL MUARA, PENJARINGAN
14470 Jakarta Utara
Indonesia

Inspection certificate 3.1

as per : EN 10204
No. : 2020-2047011900-30-20607-025
Rev. 0

PO no.	ACD/BS-N/20/07/0624	of	13.07.2020
Order no.	1042004566		
Delivery note/pos./splitt	2047011900/000000/000030	of	20.07.2020

Product	covered electrode
Trade name	**BOHLER FOX S EV 50-1 VP**
Standard designation	ISO 2560-B : E 49 18-1 A U H 5
	ISO 2560-A : E 42 5 B 42 H5
	AWS A5.1/SFA 5.1 : E7018-1H4R

Dimension	SMAW 3,25 x 350 mm	118955
Lot no.	20607	46917
Quantity	3312,0 KG	JUPB010E
		0425

Chemical composition in % of the weld metal

C	Si	Mn	P	S	Cr	Mo	Ni	V	Cu					
0,07	0,59	1,39	0,013	0,008	0,03	< 0,01	0,01	< 0,01	0,01					

Mechanical properties **ASME II/Sched.F**

Tensile test according to : ASTM E8
Specimen preparation according to : AWS B4.0

T	ReL / Rp 0,2 MPa	Rp 1,0 MPa	Rm MPa	A (Lo = 4d) %	Z %	WBH PWHT	Remarks
25°C	≥ 420		≥ 520	≥ 27		AW	Typical values

Impact test according to : ASTM E23
Specimen preparation according to : AWS B4.0

T	Impact energy KV / J	Average KV / J	Lateral expansion mm	Shear fracture %	WBH PWHT	Remarks
-50°C		≥ 70			AW	Typical values

The product BOHLER FOX S EV 50-1 VP meets the requirements of the filler metal specification ASME sec II, part C, AWS A5.1/SFA 5.1 : E7018-1H4R when tested in accordance with that specification.

Complying the corrosion testing requirements as per NACE MR 0175 standard TM 01-77-96 (SSC) and 02-84-96 (HIC).

Town	Date		Authorized representative
Bekasi	27.07.2020	This certificate was issued by DP-equipment and does not require signature.	Miftah Farid

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14470 Jakarta Utara
Indonesia

Inspection certificate 3.1

as per : EN 10204
No. : 2020-2047011831-30-20098-025
Rev. 0

PO no.	ACD/JK-N/20/04/0464	of	27.04.2020
Order no.	1042004411		
Delivery note/pos./splitt	2047011831/000000/000030	of	08.07.2020
Product	GTAW rod/wire		
Trade name	**BOHLER S EMK 6**		
Standard designation	EN ISO 636-A : W 42 5 3Si1 AWS A5.18/SFA 5.18 : ER70S-6		
Dimension	2,4 x 1000mm		118955
Lot no.	20098		86356 JU10B00W
Quantity	2500,0 KG		0425

Chemical composition in % of the product

C	Si	Mn	P	S	Cr	Mo	Ni	V	Cu					
0,06	0,87	1,51	0,017	0,012	< 0,01	< 0,01	< 0,01		0,02					

Mechanical properties **ASME II/Sched.F**

Tensile test — according to : ASTM E8
Specimen preparation — according to : AWS B4.0

T	ReL / Rp 0,2 MPa	Rp 1,0 MPa	Rm MPa	A (Lo = 4d) %	Z %	WBH PWHT	Remarks
25°C	≥ 420		≥ 500	≥ 25		AW	Typical values

Impact test — according to : ASTM E23
Specimen preparation — according to : AWS B4.0

T	Impact energy KV / J	Average KV / J	Lateral expansion mm	Shear fracture %	WBH PWHT	Remarks
-50°C		≥ 47			AW	Typical values

The product BOHLER S EMK 6 meets the requirements of the filler metal specification ASME sec II, part C, AWS A5.18/SFA 5.18 : ER70S-6 when tested in accordance with that specification.

Complying the corrosion testing requirements as per NACE MR 0175 standard TM 01-77-96 (SSC) and 02-84-96 (HIC).

Town	Date		Authorized representative
Bekasi	13.07.2020	This certificate was issued by DP-equipment and does not require signature.	Miftah Farid

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Phone : +62-254-7850344/5/6, Fax : +62-254-785037

WELDING PROCEDURE SPECIFICATION (WPS)

In accordance with
ASME Section IX:2021 Boiler and Pressure Vessel Code

Organization Name: **PT. HANAZONO ENGINEERING INDONESIA** By: Quality Departement
Welding Procedure Specification No.: **009/HEI/WPS/MIGAS/21** Date: 11/10/2021 Supporting PQR No.(s): **009/HEI/WPS/MIGAS/21**
Revision No.: 0 Date: 11/10/2021

Welding Process (es): SMAW Type (s): Manual
(Automatic, Manual, Machine or Semi-Auto)

JOINT (QW - 402) **Details**

Joint Design: See Joint detail
Root Spacing: See Joint detail
Backing: With / Without
Backing Material (Type): as per joint detail

See Joint Details

sketches, production Drawings, Weld Symbols or Writen Description Should show the general arrangement of the parts to be welded. Where applicable, the root spacing and the details of weld groove maybe specified.

Sketches may be attached to illustrate joint design, weld layers, and bead sequence (e.g., fot thoughness procedures, for multiple process procedures, etc.)

***BASE METALS (QW - 403)**

P. No. 8 Group No. 1 to P. No. 8 Group No. 1
OR

Specification type, grade, or UNS: SA 240
to Specification type, grade, or UNS: TP304H
OR
Chem. Analysis and Mech. Prop: -
to Chem. Analysis and Mech. Prop: -
Thickness Range :
Base Metal : Groove: 5 mm ~ 60 mm Fillet: All
Maximum Pass Thickness ≤½ in. (13mm) (Yes) √ (No) -
Other

***FILLER METALS (QW - 404)**

	1
	SMAW
Spec. No. (SFA)	A 5.4
AWS No. (Class)	E308L-16
F - No.	5
A - No.	8
Size of Filler Metals	Φ 3.2 ~ 4.0 mm
Weld Metal	
Deposit Thickness	
Groove	Max 60mm
Fillet	All
Electrode Flux (Class)	N/A
Flux Type	N/A
Flux Trade Name	N/A
Consumable Insert	N/A
Other	Manufacturer : AVESTA Electrode Name : **Avesta 308L-16**

*Each base metal-filler metal combination should be specified individually.

WELDING INSPECTOR IM MIGAS
Nomor Registrasi Migas
AYG -07981/0016/2021

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WELDING PROCEDURE SPECIFICATION (WPS)

In accordance with
ASME Section IX:2021 Boiler and Pressure Vessel Code

Welding Procedure Specification No. : **009/HEI/WPS/MIGAS/21** REV. 0

POSITIONS (QW - 405)

Position(s) of Groove	All
Welding Progression	Uphill
Position(s) of Fillet	All

POSTWELD HEAT TREATMENT (QW - 407)

Temperature Range	N/A
Time Range	N/A

t = up to 2" - 1 Hour / inch, 15 minute minimum

t = over 2" to 5" - 2 Hour + 15 minute for each additional inch, over 2"

PREHEAT (QW - 406)

Preheat Temp. Min	Ambient Temp. (30 ^{0}C)
Interpass Temp. Max.	200 ^{0}C
Preheat Maintenance	NA

(Continuous or special heating, where applicable, should specified)

GAS (QW - 408)

	Persent Composition		
	Gas (es)	Mixture	Flow Rate
Shielding	None	None	None
Trailing	None	None	None
Backing	None	None	None
Other	None	None	None

ELECTRICAL CHARACTERISTIC (QW - 409)

Weld Pass(es)	Process	Filler Metal		Current Type & Polarity	Amps (Range)	Wire Feed Speed (Range)	Energy or Power (Range)	Volts (Range)	Travel Speed (Range)	Other (e.g., Remaks, Comments, Hot Wire Addition, Technique, Process Torch Angle, etc.)
		Class	Dia							
Root	SMAW	E308L-16	3.2 / 4.0	DCEP	90 ~ 100	-	-	22 ~ 24	65 ~ 85	-
Fill					105 ~ 120	-	-	24 ~ 26	70 ~ 90	-
Cap					110 ~ 130	-	-	23 ~ 26	75 ~ 90	-

Amps and Volts, or power or energy range, should be specified for each electrode size, position, and thickness, etc.

Pulsing current N/A Heat Input (max.) 2.7 Kj

Tungsten Electrode Size and Type N/A
(Pure Tungsten, 2% Thoriated, etc.)

Mode of Metal transfer for GMAW (FCAW) N/A
(Spray Arc, Short-Circuiting Arc, etc.)

Other N/A

TECHNIQUE (QW - 410)

String or Weave Bead	String or weave
Orifice, Nozzle, or Gas Cup Size	N/A
Initial and Interpass Cleaning (Brushing, Grinding, etc.)	Brushing and Grinding
Method of Back Gouging	Back Grinding / Back Gouging
Oscillation	N/A
Contact Tube to Work Distance	N/A
Multiple or Single Pass (Per Side)	Single or Multi
Multiple or Single electrode	Single
Electrode Spacing	N/A
Peening	N/A
Other	Welds shall be cleaned between each pass. When completed, remove all slag & projection with grinding and brushing

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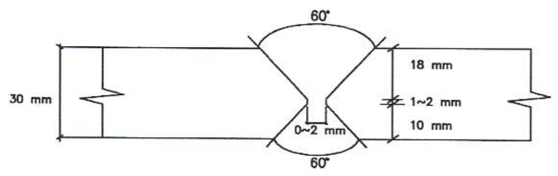
WELDING PROCEDURE SPECIFICATION (WPS)
In accordance with
ASME Section IX:2021 Boiler and Pressure Vessel Code

Welding Procedure Specification No. : **009/HEI/WPS/MIGAS/21** REV. 0

JOINT DETAILS

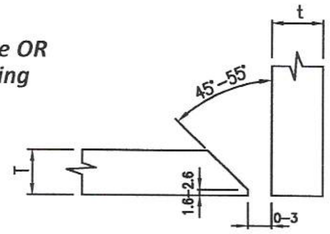
DOUBLE VEE GROOVE
T = t

Welded from one side



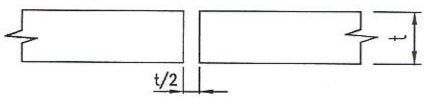
SINGLE BEVEL-CORNER JOINT
T = t

Welded from one side OR both side Back Grinding



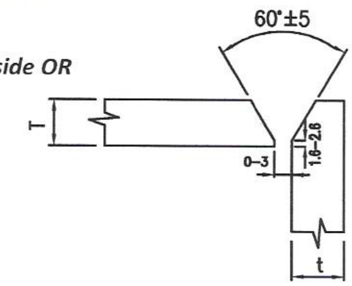
SQUARE BUTT

Welded from BOTH SIDES, T = 6 mm **Max Root gap. 0 - t/2**



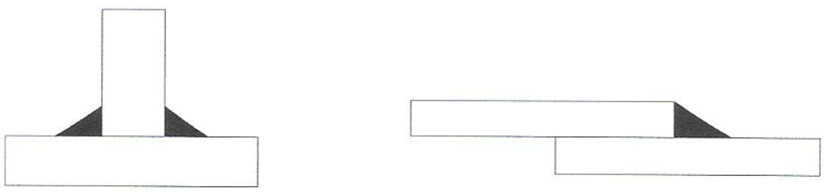
SINGLE VEE GROOVE
T = t

Welded from one side OR both side



FILLET

UNLIMITED



For Non-Impact tested applications only, the foollowing AWS/SFA clasification can be used with this procedure :
SMAW : E308L-16 / *5.4*

Weld Joint description shown are not inclusive of all of those found on job site. Weld joint design reference in an engineering specification or design shall take precedence over weld joint shown in this WPS.

Prepared By,	Reviewed By,	Reviewed By,	Verified by,
PT Hanazono Engineering Indonesia			MIGAS
QC	IWE	QC Manager	
PT. HANAZONO ENGINEERING INDONESIA	International Institute of Welding IWE Andi Iskandar ID/001/IWE-0489 Issue date 01/12/2016		Nomor Registrasi Migas IM AYG - 07921/0076/2021
Bayu Satrio Utomo	Andi Iskandar	Rusnandi	
Date : NOV 03, 2021	Date : NOV 3, 2021	Date : NOV 03, 2021	Date :

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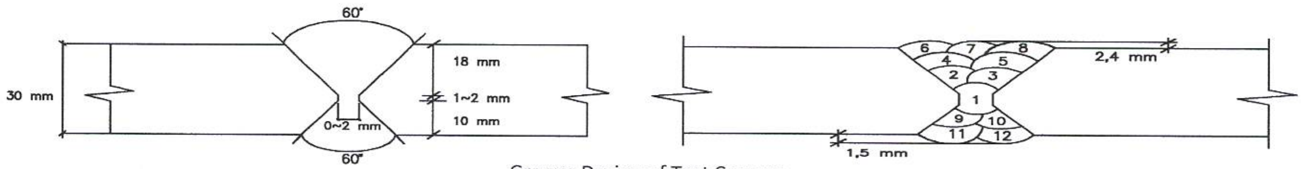
PROCEDURE QUALIFICATION RECORD (PQR)

Record Actual Conditions Used to Weld test Coupon

Organization Name: **PT. HANAZONO ENGINEERING INDONESIA**
Procedure Qualification Record No.: **009/HEI/PQR/MIGAS/21** Date: October 11, 2021
WPS No.: **009/HEI/WPS/MIGAS/21**
Welding Process (es): SMAW
Types (Manual, Automatic, Semi-Automatic): Manual

JOINTS (QW - 402)



Groove Design of Test Coupun

(For combination qualifications, the deposited weld metal thickness shall be recorder for each filler metal and process used.)

BASE METAL (QW - 403)

Maaterial Spec.: SA 240
Type or Grade, or UNS Number: TP304H
P-No.8 - Group No. 1 to P-No.8 - Group No. 1
Thickness of Test Coupun: 30mm
Diameter of test Coupun: N/A
Maximum Pass Thickness: ≤½ in. (13mm)
Other: N/A

FILLER METAL (QW - 404)

SFA Specification: A 5.4
SWA Specification: E308L-16
Filler Metal F-No.: 5
Weld Metal Analysis A-No.: 8
Size of Filler Metal: Φ 3.2mm & Φ 4.0mm
Filler Metal Product Form: N/A
Supplemental Filler Metal: N/A
Electrode Flux Classification: N/A
Flux Type: N/A
Flux Trade Name: Lime Titania
Weld Metal Thickness: 30mm
Other: AVESTA 308L-16

POSITION (QW - 405)

Position(s) of Groove: 3G
Weld Progression (Uphill, Downhill): Uphill
Other: N/A

PREHEAT (QW - 406)

Preheat Temperature: Ambient Temp. (30 °C)
Interpass Temperature: 200 °C
Other: N/A

POST WELD HEAT TREATMENT (QW - 407)

Temperature Range: N/A
Time: N/A
Others: N/A

GAS (QW - 408)

	Persent Composition		
	Gas (es)	Mixture	Flow Rate
Shielding	None	None	None
Trailing	None	None	None
Backing	None	None	None

ELECTRICAL CHARACTERISTIC (QW - 409)

Current: DCEP
Polarity: *See Table Welding Parameter*
Amps: *See Table Welding Parameter*
Waveform Control: N/A
Power or Energy: N/A
Arc Time: N/A
Weld Bead Length: N/A
Tungsten Electrode Size: N/A
Mode of Metal Transfer for GMAW (FCAW): N/A
Heat Input: See Table Welding Parameter
Other: N/A

TECHNIQUE (QW - 410)

Travel Speed: See Table Welding Parameter
String or Weave Bead: Weave
Osciliation: N/A
Multipass or Single Pass (Per Side): Multipass
Single or Multiple Electrodes: Single
Other: N/A

Nomor Registrasi Migas
AYG-07981/DDT6/2021

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PROCEDURE QUALIFICATION RECORD (PQR)

Record Actual Conditions Used to Weld test Coupon

Procedure Qualification Record No. : **009/HEI/PQR/MIGAS/21** Rev. 0

WELDING PARAMETER

Weld No.	Welding Process	Filer Metal Class	Filer Metal Dia.	Type Polarity	Ampere	Volt	Travel Speed Range (mm/min)	Heat Input (Kj)
Front Side								
1	SMAW	E308L-16	3.2 mm	DCEP	96	22	69	1,84
2					112	24	74	2,18
3					110	24	74	2,14
4					115	24	73	2,27
5					118	26	80	2,30
6					120	25	82	2,20
7					121	25	81	2,24
8					123	25	76	2,43
Back Side								
9	SMAW	E308L-16	4.0 mm	DCEP	118	26	82	2,24
10					119	25	81	2,20
11					119	25	83	2,15
12					120	25	83	2,17

TENSILE TEST (QW - 160)

Specimen No.	Width (mm)	Thickness (mm)	Area (mm^2)	Ultimate Total Load (kN)	Ultimate Unit Strength (N/mm^2)	Type Failure & Location
T1	19,52	29,03	566,67	353,8	624	Ductile (weldmetal)
T2	19,45	29,09	565,8	354,96	627	Ductile (weldmetal)

GUIDE BENT TESTS (QW - 160)

Type and Figure No.	Result
Side Bend (SB1)	No Open Discountinuity was observed
Side Bend (SB2)	No Open Discountinuity was observed
Side Bend (SB3)	No Open Discountinuity was observed
Side Bend (SB4)	No Open Discountinuity was observed

TOUGHNESS TESTS (QW -170)

Specimen No.	Notch Location	Specimen Size	Test temp. (°C)	Toughness Values % Shear	Toughness Values Mils (in.) or mm	Drop Weight Break (Y/N)
N/A	N/A	N/A	N/A	N/A		N/A

Comments

Nomor Registrasi Migas
AYG - 07901/00F6/2021

WELDING INSPECTOR IM

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PROCEDURE QUALIFICATION RECORD (PQR)

Record Actual Conditions Used to Weld test Coupon

Procedure Qualification Record No. : **009/HEI/PQR/MIGAS/21** Rev. 0

FILLET-WELD TEST (QW - 180)

Result - Satisfactory : Yes N/A No N/A Penetration into Parent Metal : Yes N/A No N/A

Macro - Result None

HARDNESS TESTS

Test No	Test Location	Vickers Hardness Value HV 10, Kgf/mm²			Remarks
		12°°			
		Line 1	Line 2	Line 3	
---Blank---	N/A	N/A	N/A	N/A	

Other Tests

Type of Test None

Deposit Analysis None

Other Radiography examination, Result : PASS, Report No. : 003/RT/WPS/HEI/IX/21 by **PT. Rire Sanjaya Sakti**

Welder's Name **JEMANI** Clock No. - Stamp No. **JM-0305**

Test Conducted by : PT. Hi-Test Laboratory Test No. : HT/JKT/1021/0096

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 Boiler and Pressure Vessel Code

Prepared By,	Reviewed By,	Reviewed By,	Verified by,
PT Hanazono Engineering Indonesia			MIGAS
QC	WE	QC Manager	
PT. HANAZONO Engineering Indonesia	International Institute of Welding IWE Andi Iskandar ID/001/IWE-0489 Issue date 01/12/2016		WELDING INSPECTOR IM Nomor Registrasi Migas AYG - 07901/08T6/2021
Bayu Satrio Utomo	Andi Iskandar	Rusnandi	
Date : NOV 03, 2021	Date : NOV 3, 2021	Date : NOV 03, 2021	Date :

PT. Hi-Test
Laboratory of Mechanical Testing
BSD City :
Taman Tekno Blok A2 No. 49
Bumi Serpong Damai (BSD) – Tangerang - Indonesia
Telp : +62 21 75882884; Fax : +62 21 75882885
E-mail : hi-test@hitestlab.com
Website : www.hitestlab.com

ilac-MRA

KAN
KOMITE AKREDITASI NASIONAL
Laboratorium Penguji
LP - 422 - IDN

Testing Report

(This Report is issued subjected to the term & conditions set out below)

Customer	: **PT. Hanazono Engineering Indonesia**	**Job No**	: B21654
Address	: Jl. Bojonegara No. 44 Kertasana, Serang, Banten 42454	**No.**	: HT/JKT/1021/0096
		Total of Page	: 1 of 2
Reference Code	: ASME Sect. IX : Ed 2021	**Date of Received**	: 14 October 2021
Test Method	: ASTM E8/E8M-21	**Date of Tested**	: 19 October 2021
Object to be tested	: (as received)	**PO No**	: --
		Project Name	: --
		Sample Marking	: 10. HEI 2

One welded stainless steel plate Joint test sample, size: 30 mm thickness, material spec: SA 240 TP 304H, WPS No. 009/HEI/WPS/MIGAS/21, PQR No. 009/HEI/PQR/MIGAS/21, welding process: SMAW, welding position: 3G, filler metal: E308L-16, for Welding Procedure Specification Test.

Type of Test : **Reduced Section Tension Test (Transverse Specimen)**
Environment Temp : **26.1°C**

Test Specimen No		**T1**	**T2**
Measured Thickness	**(mm)**	29.03	29.09
Measured Width	**(mm)**	19.52	19.45
Effective Area	**(mm^2)**	566.67	565.80
Ultimate Tensile Load	**(kN)**	353.80	354.96
Ultimate Tensile Strength	**(N/mm^2)**	624	627
Location of Failure		Weld Metal	Weld Metal
Type of Failure		Ductile	Ductile

Testing Machine Used : INSTRON 600 DX,
Model: 600 DX, S/N: S2513, Capacity : 600 kN
Remark : --
Test Conducted By : Canra Latipolia, ST
Witnessed By :

Approved Signatory

PT. Hi-Test JKT Laboratory of Mechanical Testing

Suhadi, ST
Laboratory Manager

PT. Hi-Test
Laboratory of Mechanical Testing
BSD City :
Taman Tekno Blok A2 No. 49
Bumi Serpong Damai (BSD) – Tangerang - Indonesia
Telp : +62 21 75882884; Fax : +62 21 75882885
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Testing Report

(This Report is issued subjected to the term & conditions set out below)

Customer	: **PT. Hanazono Engineering Indonesia**	**Job No**	: B21654
Address	: Jl. Bojonegara No. 44 Kertasana, Serang, Banten 42454	**No.**	: HT/JKT/1021/0096
		Total of Page	: 2 of 2
Reference Code	: ASME Sect. IX : Ed 2021	**Date of Received**	: 14 October 2021
Test Method	: ASTM E190-14	**Date of Tested**	: 19 October 2021
Object to be tested	: (as received)	**PO No**	: --
		Project Name	: --
		Sample Marking	: 10. HEI 2

One welded stainless steel plate Joint test sample, size: 30 mm thickness, material spec: SA 240 TP 304H, WPS No. 009/HEI/WPS/MIGAS/21, PQR No. 009/HEI/PQR/MIGAS/21, welding process: SMAW, welding position: 3G, filler metal: E308L-16, for Welding Procedure Specification Test.

Type of Test : **Bending Test (Transverse Specimen)**

Test Temperature	: **26.1°C**				
Test Weld Ment Thickness	: 30	mm	**Test Specimen Width**	: 10	mm
Former Diameter	: 40	mm	**Bend Angle**	: 180	Degree
Shoulder Distance	: 63	mm			

Specimen No	Type of Bend	Observation	Result
SB1	Side Bend	No Open Discontinuity was Observed	Accepted
SB2	Side Bend	No Open Discontinuity was Observed	Accepted
SB3	Side Bend	No Open Discontinuity was Observed	Accepted
SB4	Side Bend	No Open Discontinuity was Observed	Accepted

Testing Machine Used : MOTOR PUMP BENDING TEST MACHINE,
Model: Daventry England, S/N: DG 8881, Capacity: 700 Bar

Remark : --
Test Conducted By : Deri Rizki Ramadhan, ST
Witnessed By :

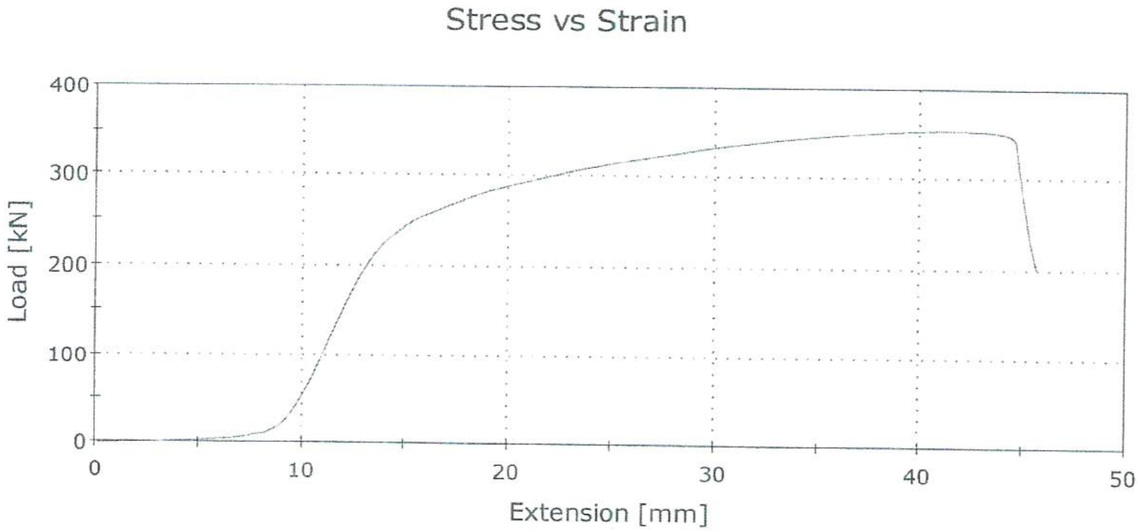
Approved Signatory

Suhadi, ST
Laboratory Manager

Tuesday, October 19, 2021

PT. HI-TEST

Company	PT. Hanazono Engineering Indonesia
Report No	HT/JKT/1021/0096
Sample/Stamp No	10. HEI 2 - T1

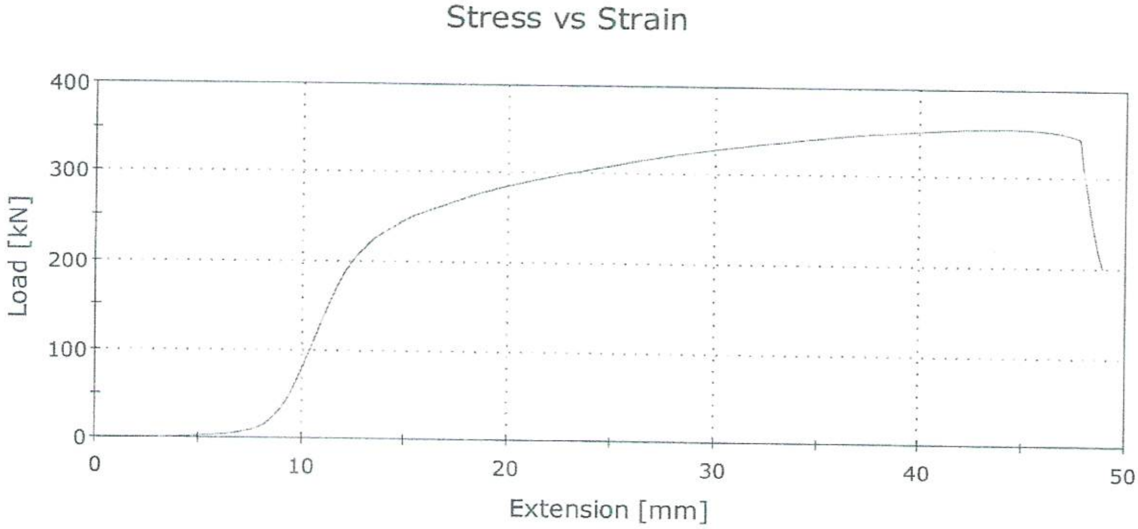


	Specimen label	Thickness [mm]	Width [mm]	Initial Area [mm^2]	Load at Tensile Strength [kN]	Tensile Stress [MPa]
1	10. HEI 2 - T1	29.03	19.52	566.67	353.80	624

Tuesday, October 19, 2021

PT. HI-TEST

Company	PT. Hanazono Engineering Indonesia
Report No	HT/JKT/1021/0096
Sample/Stamp No	10. HEI 2 - T2



	Specimen label	Thickness [mm]	Width [mm]	Initial Area [mm^2]	Load at Tensile Strength [kN]	Tensile Stress [MPa]
1	10. HEI 2 - T2	29.09	19.45	565.80	354.96	627

Mill Test Certificate/검사증명서

Certificate No./증명서번호 : 171120-FX01PN-0001A1-0001
Date of Issue/발행일자 : Nov., 17, 2020

Order No./계약번호 : 01S2975742
Supplier /공급자 : Myungsung Metal
Customer /고객사 : MYUNGSUNG METAL

PO No./주문번호 : 01S2975742
Commodity /품명 : STAINLESS SLAB
Spec & Type /규격 : ASTM-A240-304H

Size/치수 (mm)	Product No. /제품번호	Quantity /수량	Weight /중량 (kg)	Heat No. /제강번호
30x1600x6250	SG30008 011	1	19,990	SG30009
*** Sub Total (010) ***		1	19,990 (kg)	
*** Grade Total ***		1	19,990 (kg)	
*** Grand Total ***		1	19,990 (kg)	

=== Last Item ===

Chemical Composition/화학성분

Division	C (%)	Si (%)	Mn (%)	P (%)	S (%)	Cr (%)	Ni (%)	Cu (%)	Mo (%)	N (ppm)
L	0.0543	0.492	1.015	0.0198	0.0023	18.286	8.177	0.009	0.007	335

CERTIFIED TRUE COPY | PILLAR TECH CO.,LTD. | Q.A

PT HANAZON ENGINEERING INDONESIA QC DEPARTMENT

Reviewed By
Rusmadi
Sept 12, 2021

QA DIRECTOR 2017.11.17 SG KIM

COPY

원본대조필

* Division - L : Ladle Analysis

We hereby certify that the material herein has been made in accordance with the order and above specification.
This product is made by fully killed process.
No repair welding has been performed on the products.
Test Certificate is issued according to EN10204 3.1.

본 검사증명서 위.변조시 사문서 위조(형법 제231조)로 불이익을 당하실 수 있습니다

Surveyor To :

S.S. Ahn

Chief of material testing section Ahn, Seong Soo

PT. RISE SANJAYA SAKTI
Rope Access & NDT Services
Head Office : Jl. Wibawa Mukti II Kav.1 -Jati Asih
Bekasi 17423 - Jawa Barat, Indonesia
Phone : +62-21 8243 5361 / 8241 5794
Fax : +62-21 8243 5168
Email : admin@rss.co.id, Website : www.rss.co.id

RADIOGRAPHY EXAMINATION REPORT

Client : PT. HANAZONO ENGINEERING INDONESIA
Contractor : -
Project : WPS-PQR

Job No : -
Work Order / Request No : -
Location : W/S PT. HEI-Bojonegara

Report No : 005/RT/WPS-PQR/HEI/X/21
Shooting Date : 06-10-2021
Date of Report : 07-10-2021

Radiographic Procedure : RSS/RT-ASME/008
Application Code : ASME VIII DIV. 1
Material Specification : SA 240 TP 304

Radiation Source : IR - 192
F/S Source Size : 3.0 x 2.7 mm
Activity : 49 Ci
Exp. Time : 1 Min

Screen Type : LEAD
Back / Front Thick : 0.125 mm
Double ☐ Single Load ☑
Film type : AGFA D7

SFD : 381 mm / Inch
SSOF : 35 mm / Inch
SOD : 348 mm / Inch
Peny / I.Q.I : ASTM IB

RT Tech : DWSI ☐ DWDI ☐ SWSI ☑
IQI Type : S Side ☑ F Side ☐
Sensitivity : WI No.10 F Dummy 14
Unsharp Geo : 0.2 mm

Identification	Joint No	Material Size Thick	FILM SEQUENCE – Location Marker 4"X10"	4"X15"	7"X17"	Welder Stamp	Type of Discontinuity – Surface Indication	Crack	Incomplete Penetration	Incomplete Fusion	Slag Inclusion	Slag Lines	Concavity	Brun Though	Under Cut	Gas and Worm Hole	Porosity	Others	Sensitivity	Range Density	Judgement	Remarks
009/HEI/WPS-MIGAS/21	TC-02	Thk 30 mm		A-B		IM-0305													10	2.5-3.0	ACC	

Technician:

Total Welds/Film Used : 1 Joints
(4" x 10"): Sheets
(4" x 15"): 1 Sheets
(7" x 17"): Sheets

Comments :

Radiographer:
NDT Level : II
Date 07-10-2021 TEGUH. P.

QA/QC Approved :
PT - HEI
Bayu. S
Date: 07/10/2021

Authorized Inspector:
Date :

Customer Rep :
Date :

PT. voestalpine Böhler Welding Asia Pacific

voestalpine Böhler Welding Asia Pacific

Kawasan Industri Jababeka Cikarang
Jl. Industri Selatan 2 Blok JJ NO. 7-10
17530 Bekasi
T. +6221893 7572, F. +6221893 7518
www.voestalpine.com/welding

PT Bhinneka Bajanas

JL. Karang Bolong Raya No. 5
14430 Jakarta
Indonesia

Inspection certificate 3.1

as per : EN 10204
No. : 2020-2047012190-10-20613-025
Rev. 0

PO no.	042/BB/IX/2020	of	03.09.2020
Order no.	1042004687		
Delivery note/pos./splitt	2047012190/000000/000010	of	14.09.2020
Product	covered electrode		
Trade name	BOHLER FOX S 308L-16		
Standard designation	EN ISO 3581-A : E 19 9 L R 3 2 AWS A5.4 : E308L-16		
Dimension	SMAW 3,25 x 350 mm		107249
Lot no.	20613		82728
Quantity	405,9 KG		JS92400E 0425

Chemical composition in % of the weld metal

C	Si	Mn	P	S	Cr	Mo	Ni	Cu	N					
0,03	0,76	0,55	0,016	0,016	19,18	0,10	9,66	0,12	0,08					

Mechanical properties ASME II/Sched.F

Tensile test according to : ASTM E8
Specimen preparation according to : AWS B4.0

T	ReL / Rp 0,2 MPa	Rp 1,0 MPa	Rm MPa	A (Lo = 4d) %	Z %	WBH PWHT	Remarks
25°C	≥ 320		≥ 520	≥ 35		AW	

Impact test according to : ASTM E23
Specimen preparation according to : AWS B4.0

T	Impact energy KV / J	Average KV / J	Lateral expansion mm	Shear fracture %	WBH PWHT	Remarks
-120°C		≥ 30			AW	

The product BOHLER FOX S 308L-16 meets the requirements of the filler metal specification ASME sec II, part C, AWS A5.4 : E308L-16 when tested in accordance with that specification.

Town	Date		Authorized representative
Bekasi	16.09.2020	This certificate was issued by DP-equipment and does not require signature.	Miftah Farid

PT HANAZONO ENGINERING INDONESIA QC DI PARTEMEN

Reviewed By QA/QC
Kurniawan
OCT. 01.2021

voestalpine
ONE STEP AHEAD.

Lampiran Kualifikasi Ahli Las No. : 0498/AYG/AL/DMT/2020
Tanggal :10 NOV 2020

LAPORAN KUALIFIKASI AHLI LAS
Nomor: 06398/AL/DMTS/2020

Menyatakan bahwa Kualifikasi Ahli Las:
Nama : **JEMANI**
Nomor Registrasi : TS-451020/23/131778.02
Tempat dan tanggal lahir : Serang, 03 Mei 1978
Alamat : Link. Kelapa Baris, RT/RW 007/009
Kec. Pulo Merak, Kota Cilegon
Perusahaan : **PT HANAZONO ENGINEERING INDONESIA**
Telah dikualifikasi sebagai juru las sesuai dengan:
Nomor WPS : 003/HEI/MIGAS/20
Nomor PQR : 003/HEI/MIGAS/20
Standar : **ASME Section IX – 2019**
Dengan data sebagai berikut:

	Pengujian lapangan	Batasan kualifikasi
Proses Pengelasan	GTAW & SMAW	GTAW & SMAW
Sifat Listrik	DCEN & DCEP	DCEN & DCEP
Posisi/Arah Pengelasan	6G / Naik	Sesuai QW-461.9 / Naik
Material Dasar:		
- Desain Sambungan	Single "V" Groove	Sesuai desain sambungan
- Diameter inch (mm)	NPS 2 inch (60,3 mm)	Minimum 25 mm
- Tebal (mm)	8,74 mm GTAW: 2,5 mm SMAW: 6,24 mm	GTAW: Maksimum 5 mm SMAW: Maksimum 12,48 mm
- Spesifikasi Material Uji	SA 312 TP 304L (P No. 8)	Sesuai QW-423
Bahan Pengisi	ER 308L (F No. 6, SFA 5.9) & E 308L-16 (F No. 5, SFA 5.4)	Sesuai QW-433
Gas Pelindung	Argon 99,99% (GTAW)	Argon 99,99% (GTAW)
Backing Gas	Argon 99,99% (GTAW)	Argon 99,99% (GTAW)
Backing / Back Weld	Dengan Backing (SMAW)	Dengan Backing (SMAW)
Jenis Pemeriksaan :		
- Visual	Ya	
- Pemeriksaan Tak Merusak (NDE)	Radiografi	
- Uji Rusak (DT)	-	
- Dan lain-lain	-	

Kualifikasi Ahli Las ini hanya berlaku pada **perusahaan tersebut di atas** sampai dengan tanggal **26 Oktober 2023**. Bila dalam waktu tiga bulan secara terus menerus tidak bekerja sesuai kualifikasinya maka Kualifikasi Ahli Las ini dianggap tidak berlaku lagi.

Diuji oleh:
Inspektur Migas

Christine Samosir, ST
NIP 19890430 201402 2001

PT. HANAZONO Engineering Indonesia
We are always partner with you

Office & Work Shop Address: Jl. Raya Bojonegara - Serdang RT/RW. 001/001 No.44
Desa Kertasana, Kec. Bojonegara, Kab Serang, Banten - Indonesia 42454
Phone : +62-254-7850344/5/6, Fax : +62-254-785037

WELDING PROCEDURE SPECIFICATION (WPS)

In accordance with
ASME Section IX:2021 Boiler and Pressure Vessel Code

Organization Name: PT. HANAZONO ENGINEERING INDONESIA By: Quality Departement
Welding Procedure Specification No.: 012/HEI/WPS/MIGAS/21 Date: 11/10/2021 Supporting PQR No.(s): 012/HEI/PQR/MIGAS/21
Revision No.: 0 Date: 11/10/2021

Welding Process (es): GTAW Type (s): Manual
(Automatic, Manual, Machine or Semi-Auto)

JOINT (QW - 402)

Details

Joint Design: See joint detail
Root Spacing: See joint detail
Backing: With or Without
Backing Material (Type): As per joint detail

See Joint Details

sketches, production Drawings, Weld Symbols or Writen Description Should show the general arrangement of the parts to be welded. Where applicable, the root spacing and the details of weld groove maybe specified

Sketches may be attached to illustrate joint design, weld layers, and bead sequence (e.g., fot thoughness procedures, for multiple process procedures, etc.)

*BASE METALS (QW - 403)

P. No.: 8 Group No.: 1 to P. No.: 8 Group No.: 1
OR

Specification type, grade, or UNS: SA312
to Specification type, grade, or UNS: TP304
OR
Chem. Analysis and Mech. Prop: -
to Chem. Analysis and Mech. Prop: -
Thickness Range :
Base Metal : Groove: 1.5 mm ~ 17,48 mm Fillet: All
Maximum Pass Thickness ≤½ in. (13mm) (Yes): √ (No): -
Other:

*FILLER METALS (QW - 404)

	1
	GTAW
Spec. No. (SFA)	A 5.9
AWS No. (Class)	ER308L
F - No.	6
A - No.	8
Size of Filler Metals	Φ 2.4 mm
Weld Metal	
Deposit Thickness	
Groove	Max. 17,48 mm
Fillet	All
Electrode Flux (Class)	N/A
Flux Type	N/A
Flux Trade Name	N/A
Consumable Insert	N/A
Other	Manufacturer : BOHLER
	Electrode Name : **Bohler S CN 23/12-IG**

*Each base metal-filler metal combination should be specified individually.

Nomor Registrasi Migas
AYG - 07981 / 08r9 / 2021
WELDING INSPECTOR IM MIGAS

PT. HANAZONO Engineering Indonesia
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Office & Work Shop Address: Jl. Raya Bojonegara - Serdang RT/RW. 001/001 No.44
Desa Kertasana, Kec. Bojonegara, Kab Serang, Banten - Indonesia 42454
Phone : +62-254-7850344/5/6, Fax : +62-254-785037

WELDING PROCEDURE SPECIFICATION (WPS)

In accordance with
ASME Section IX:2021 Boiler and Pressure Vessel Code

Welding Procedure Specification No. : **012/HEI/WPS/MIGAS/21** REV. 0

POSITIONS (QW - 405)

Position(s) of Groove	All
Welding Progression	uphill
Position(s) of Fillet	All

POSTWELD HEAT TREATMENT (QW - 407)

Temperature Range	N/A
Time Range	N/A

PREHEAT (QW - 406)

Preheat Temp. Min	Ambient Temperature (30 ^oC)
Interpass Temp. Max.	150 ^oC
Preheat Maintenance	N/A

Temperature shall be applied for thickness 1 1/4" and over

(Continuous or special heating, where applicable, should specified)

GAS (QW - 408)

	Persent Composition		
	Gas (es)	Mixture	Flow Rate
Shielding	Argon	99,99%	7 - 15 LPM
Trailing	-	-	-
Backing			
Other	-	-	-

ELECTRICAL CHARACTERISTIC (QW - 409)

Weld Pass(es)	Process	Filler Metal		Current Type & Polarity	Amps (Range)	Wire Feed Speed (Range)	Energy or Power (Range)	Volts (Range)	Travel Speed (Range)	Other (e.g., Remaks, Comments, Hot Wire Addition, Technique, Process Torch Angle, etc.)
		Class	Dia							
Root	GTAW	ER308L	2.4	DCEN	95 ~ 105	-	-	12 ~ 14	47 ~ 55	-
Fill	GTAW	ER308L	2.4	DCEN	113 ~ 125	-	-	14 ~ 17	65 ~ 75	-
Cap	GTAW	ER308L	2.4	DCEN	110 ~ 120	-	-	12 ~ 15	70 ~ 80	-

Amps and Volts, or power or energy range, should be specified for each electrode size, position, and thickness, etc.

Pulsing current N/A Heat Input (max.) 2.3 Kj

Tungsten Electrode Size and Type N/A
(Pure Tungsten, 2% Thoriated, etc.)

Mode of Metal transfer for GMAW (FCAW) N/A
(Spray Arc, Short-Circuiting Arc, etc.)

Other N/A

TECHNIQUE (QW - 410)

String or Weave Bead	Weave or string
Orifice, Nozzle, or Gas Cup Size	5, 6, or 7
Initial and Interpass Cleaning (Brushing, Grinding, etc.)	Brushing and Grinding with SS Material
Method of Back Gouging	Back Grinding with SS Material
Oscillation	N/A
Contact Tube to Work Distance	N/A
Multiple or Single Pass (Per Side)	Single or Multi
Multiple or Single electrode	Single
Electrode Spacing	N/A
Peening	N/A
Other	Welds shall be cleaned between each pass. When completed, remove all slag & projection with grinding and brushing

WELDING INSPECTOR IM MIGAS

Nomor Registrasi Migas
A-IG - 07901 / 0819 / 2021

Office & Work Shop Address: Jl. Raya Bojonegara - Serdang RT/RW. 001/001 No.44
Desa Kertasana, Kec. Bojonegara, Kab Serang, Banten - Indonesia 42454
Phone : +62-254-7850344/5/6, Fax : +62-254-785037

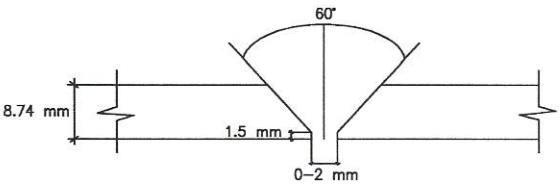
WELDING PROCEDURE SPECIFICATION (WPS)
In accordance with
ASME Section IX:2021 Boiler and Pressure Vessel Code

Welding Procedure Specification No. : **012/HEI/WPS/MIGAS/21** REV. 0

JOINT DETAILS

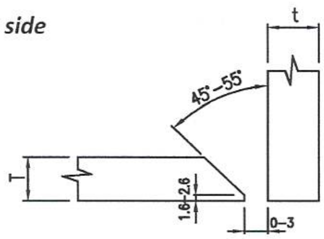
SINGLE VEE GROOVE
T = t

Welded from one side



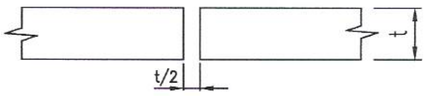
SINGLE BEVEL-CORNER JOINT
T = t

Welded from one side



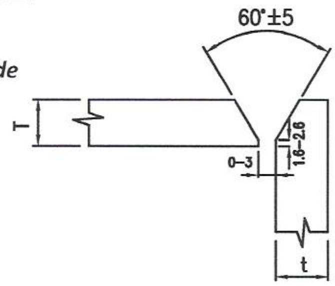
SQUARE BUTT

Welded from BOTH SIDES, T = 6 mm **Max**
Root gap. 0 - t/2



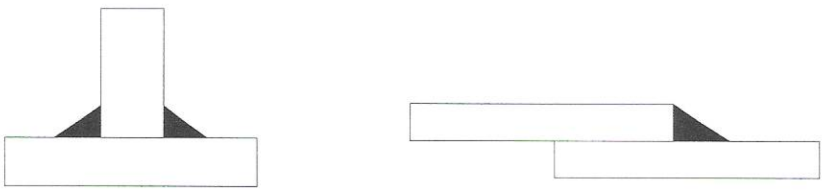
SINGLE VEE GROOVE
T = t

Welded from one side



FILLET

UNLIMITED



For Non-Impact tested applications only, the foollowing AWS/SFA clasification can be used with this procedure :
GTAW : ER308L / 5.9

Weld Joint description shown are not inclusive of all of those found on job site. Weld joint design reference in an engineering specification or design shall take precedence over weld joint shown in this WPS.

Prepared By,	Reviewed By,	Reviewed By,	Verified by,
PT Hanazono Engineering Indonesia			MIGAS
QC	WE	QC Manager	
	International Institute of Welding IWE Andi Iskandar ID/001/IWE-0489 Issue date 01/12/2016 Personnel Qualification System		Nomor Registrasi Migas AYG - 07981/0859/2021
Bayu Satrio Utomo	Andi Iskandar	Rusnandi	
Date : NOV 03, 2021	Date : NOV 3, 2021	Date : NOV 03, 2021	Date :

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We are always partner with you

Office & Work Shop Address: Jl. Raya Bojonegara - Serdang RT/RW. 001/001 No.44
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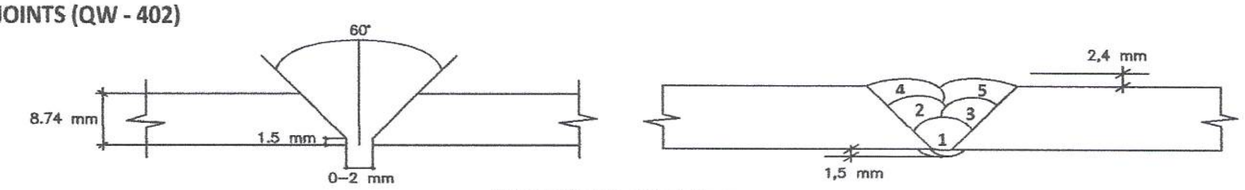
Phone : +62-254-7850344/5/6, Fax : +62-254-785037

PROCEDURE QUALIFICATION RECORD (PQR)

Record Actual Conditions Used to Weld test Coupon

Organization Name: **PT. HANAZONO ENGINEERING INDONESIA**
Procedure Qualification Record No.: **012/HEI/PQR/MIGAS/21** Date: October 11, 2021
WPS No.: **012/HEI/WPS/MIGAS/21**
Welding Process (es): GTAW
Types (Manual, Automatic, Semi-Automatic): Manual

JOINTS (QW - 402)



Groove Design of Test Coupun

(For combination qualifications, the deposited weld metal thickness shall be recorder for each filler metal and process used.)

BASE METAL (QW - 403)

Maaterial Spec.: SA-312
Type or Grade, or UNS Number: TP304
P-No.8 - Group No. 1 to P-No.8 - Group No. 1
Thickness of Test Coupun: 8.74mm
Diameter of test Coupun: 2 inch Sch 160
Maximum Pass Thickness: ≤½ in. (6mm)
Other: N/A

FILLER METAL (QW - 404)

SFA Specification: A 5.9
SWA Specification: ER308L
Filler Metal F-No.: 6
Weld Metal Analysis A-No.: 8
Size of Filler Metal: Φ 2.4mm
Filler Metal Product Form: Solid Bare
Supplemental Filler Metal: N/A
Electrode Flux Classification: N/A
Flux Type: N/A
Flux Trade Name: N/A
Weld Metal Thickness: 8.74mm
Other: BOHLER S EAS 2-IG

POSITION (QW - 405)

Position(s) of Groove: 5G
Weld Progression (Uphill, Downhill): N/A
Other: N.A

PREHEAT (QW - 406)

Preheat Temperature: N/A
Interpass Temperature: 145 ^{o}C
Other: N/A

POST WELD HEAT TREATMENT (QW - 407)

Temperature Range: N/A
Time: N/A
Others: N/A

GAS (QW - 408)

	Persent Composition		
	Gas (es)	Mixture	Flow Rate
Shielding	Argon	99,99%	13 LPM
Trailing	-	-	-
Backing	-	-	-

ELECTRICAL CHARACTERISTIC (QW - 409)

Current: DCEN
Polarity: *See Table Welding Parameter*
Amps: *See Table Welding Parameter*
Waveform Control: N/A
Power or Energy: See Table Welding Parameter
Arc Time: N/A
Weld Bead Length: N/A
Tungsten Electrode Size: 2.4mm & 2% Thoriated (EWTh-2)
Mode of Metal Transfer for GMAW (FCAW): N/A
Heat Input: See Table Welding Parameter
Other: N/A

TECHNIQUE (QW - 410)

Travel Speed: See Table Welding Parameter
String or Weave Bead: Weave
Osciliation: N/A
Multipass or Single Pass (Per Side): Multi
Single or Multiple Electrodes: Single
Other: N/A

WELDING INSPECTOR IMI
Nomor Registrasi Migas
AYG - 07981/0879/2021

PT. HANAZONO Engineering Indonesia
We are always partner with you

Office & Work Shop Address: Jl. Raya Bojonegara - Serdang RT/RW. 001/001 No.44
Desa Kertasana, Kec. Bojonegara, Kab Serang, Banten - Indonesia 42454
Phone : +62-254-7850344/5/6, Fax : +62-254-785037

PROCEDURE QUALIFICATION RECORD (PQR)

Record Actual Conditions Used to Weld test Coupon

Procedure Qualification Record No. : **012/HEI/PQR/MIGAS/21** Rev. 0

WELDING PARAMETER

Weld No.	Welding Process	Filer Metal		Type Polarity	Ampere	Volt	Travel Speed Range (mm/min)	Heat Input (Kj)
		Class	Dia.					
1	GTAW	ER308L	2.4 mm	DCEN	101	12	47	1,55
2					119	16	69	1,66
3					119	16	69	1,66
4					114	14	72	1,33
5					116	14	74	1,32

TENSILE TEST (QW - 160)

Specim en No.	Width (mm)	Thickness (mm)	Area (mm²)	Ultimate Total Load (kN)	Ultimate Unit Strength (N/mm²)	Type Failure & Location
T1	13,48	8,32	112,15	69,7	621	Ductile (Basemetal)
T2	13,52	8,37	113,16	70,98	627	Ductile (Basemetal)

GUIDE BENT TESTS (QW - 160)

Type and Figure No.	Result
Face Bend (FB1)	No open discontinuity was observed
Face Bend (FB2)	No open discontinuity was observed
Root Bend (RB1)	Discontinuity 2.40 mm of opening was observed
Root Bend (RB2)	Discontinuity 2.28 mm of opening was observed

TOUGHNESS TESTS (QW -170)

Specimen No.	Notch Location	Specimen Size	Test temp. (°C)	Toughness Values		Drop Weight Break (Y/N)
				% Shear	Mils (in.) or mm	
--Blank--	N/A	N/A	N/A	N/A		N/A

Comments

WELDING INSPECTOR IM MIGAS

Nomor Registrasi Migas

AYG – 07981/0859/2021

PT. HANAZONO Engineering Indonesia
We are always partner with you

Office & Work Shop Address: Jl. Raya Bojonegara - Serdang RT/RW. 001/001 No.44
Desa Kertasana, Kec. Bojonegara, Kab Serang, Banten - Indonesia 42454
Phone : +62-254-7850344/5/6, Fax : +62-254-785037

PROCEDURE QUALIFICATION RECORD (PQR)

Record Actual Conditions Used to Weld test Coupon

Procedure Qualification Record No. : **012/HEI/PQR/MIGAS/21** Rev. 0

FILLET-WELD TEST (QW - 180)

Result - Satisfactory : Yes N/A No N/A Penetration into Parent Metal : Yes N/A No N/A

Macro - Result None

HARDNESS TESTS

Test No	Test Location	Vickers Hardness Value HV 10, Kgf/mm²			Remarks
		12°°			
		Line 1	Line 2	Line 3	
---Blank---	N/A	N/A	N/A	N/A	

Other Tests

Type of Test None

Deposit Analysis None

Other Radiographic Examination, Result : PASS, Report No. : 001/RT/WPS/HEI/IX/21 by **PT. Rire Sanjaya Sakti**

Welder's Name **JEMANI** Clock No. - Stamp No. **JM-0305**

Test Conducted by : PT. Hi-Test Laboratory Test No. : HT/JKT/1021/0099

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 Boiler and Pressure Vessel Code

Prepared By,	Reviewed By,	Reviewed By,	Verified by,
PT Hanazono Engineering Indonesia			MIGAS
QC	WE	QC Manager	
PT. HANAZONO ENGINEERING INDONESIA QC DEPARTMENT	International Institute of Welding IWE Andi Iskandar ID/001/IWE-0489 Issue date 01/12/2016 Personnel Qualification System		WELDING INSPECTOR IM MIGAS Nomor Registrasi Migas AYG-07981/0819/2021
Bayu Satrio Utomo	**Andi Iskandar**	**Rusnandi**	
Date : NOV 03, 2021	Date : NOV 3, 2021	Date : NOV 03, 2021	Date :

PT. Hi-Test
Laboratory of Mechanical Testing
BSD City :
Taman Tekno Blok A2 No. 49
Bumi Serpong Damai (BSD) – Tangerang - Indonesia
Telp : +62 21 75882884; Fax : +62 21 75882885
E-mail : hi-test@hitestlab.com
Website : www.hitestlab.com

ilac-MRA

KAN
KOMITE AKREDITASI NASIONAL
Laboratorium Penguji
LP - 422 - IDN

Testing Report

(This Report is issued subjected to the term & conditions set out below)

Customer	: **PT. Hanazono Engineering Indonesia**	**Job No**	: B21654
Address	: Jl. Bojonegara No. 44 Kertasana, Serang, Banten 42454	**No.**	: HT/JKT/1021/0099
		Total of Page	: 1 of 2
Reference Code	: ASME Sect. IX : Ed 2021	**Date of Received**	: 14 October 2021
Test Method	: ASTM E8/E8M-21	**Date of Tested**	: 19 October 2021
Object to be tested	: (as received)	**PO No**	: --
		Project Name	: --
		Sample Marking	: 10. HEI 5

One welded stainless steel pipe Joint test sample, size: Ø 2" SCH 160 (8. 74 mm thickness), material spec: SA 312 TP 304H, WPS No. 012/HEI/WPS/MIGAS/21, PQR No. 012/HEI/PQR/MIGAS/21, welding process: GTAW, welding position: 5G, filler metal: E308L, for Welding Procedure Specification Test.

Type of Test : **Reduced Section Tension Test (Transverse Specimen)**
Environment Temp : **26.1°C**

Test Specimen No		**T1**	**T2**
Measured Thickness	**(mm)**	8.32	8.37
Measured Width	**(mm)**	13.48	13.52
Effective Area	**(mm^2)**	112.15	113.16
Ultimate Tensile Load	**(kN)**	69.70	70.98
Ultimate Tensile Strength	**(N/mm^2)**	621	627
Location of Failure		Base Metal	Base Metal
Type of Failure		Ductile	Ductile

Testing Machine Used : INSTRON 600 DX,
Model: 600 DX, S/N: S2513, Capacity : 600 kN
Remark : --
Test Conducted By : Canra Latipolia, ST
Witnessed By :

Approved Signatory

PT. Hi-Test JKT

Suhadi, ST
Laboratory Manager

PT. Hi-Test
Laboratory of Mechanical Testing
BSD City :
Taman Tekno Blok A2 No. 49
Bumi Serpong Damai (BSD) – Tangerang - Indonesia
Telp : +62 21 75882884; Fax : +62 21 75882885
E-mail : hi-test@hitestlab.com
Website : www.hitestlab.com

ilac-MRA

KAN
KOMITE AKREDITASI NASIONAL
Laboratorium Penguji
LP - 422 - IDN

Testing Report

(This Report is issued subjected to the term & conditions set out below)

Customer	: **PT. Hanazono Engineering Indonesia**	**Job No**	: B21654
Address	: Jl. Bojonegara No. 44 Kertasana, Serang, Banten 42454	**No.**	: HT/JKT/1021/0099
		Total of Page	: 2 of 2
Reference Code	: ASME Sect. IX : Ed 2021	**Date of Received**	: 14 October 2021
Test Method	: ASTM E190-14	**Date of Tested**	: 19 October 2021
Object to be tested	: (as received)	**PO No**	: --
		Project Name	: --
		Sample Marking	: 10. HEI 5

One welded stainless steel pipe Joint test sample, size: Ø 2" SCH 160 (8. 74 mm thickness), material spec: SA 312 TP 304H, WPS No. 012/HEI/WPS/MIGAS/21, PQR No. 012/HEI/PQR/MIGAS/21, welding process: GTAW, welding position: 5G, filler metal: E308L, for Welding Procedure Specification Test.

Type of Test : **Bending Test (Transverse Specimen)**

Test Temperature	: **26.1°C**				
Test Weld Ment Thickness	: 8.74	mm	**Test Specimen Width**	: 19	mm
Former Diameter	: 34.96	mm	**Bend Angle**	: 180	Degree
Shoulder Distance	: 55.64	mm			

Specimen No	Type of Bend	Observation	Result
FB1	Face Bend	No Open Discontinuity was Observed	Accepted
FB2	Face Bend	No Open Discontinuity was Observed	Accepted
RB1	Root Bend	Discontinuity 2.40 mm of Opening was Observed	Accepted
RB2	Root Bend	Discontinuity 2.28 mm of Opening was Observed	Accepted

Testing Machine Used : GOTECH COMPUTERISED UNIVERSAL TESTING MACHINE, Model : GT-7001-LC 50, S/N : TC0500480, Capacity : 500 kN

Remark : --

Test Conducted By : Deri Rizki Ramadhan, ST

Witnessed By :

Approved Signatory

PT. Hi-Test JKT Laboratory of Mechanical Testing

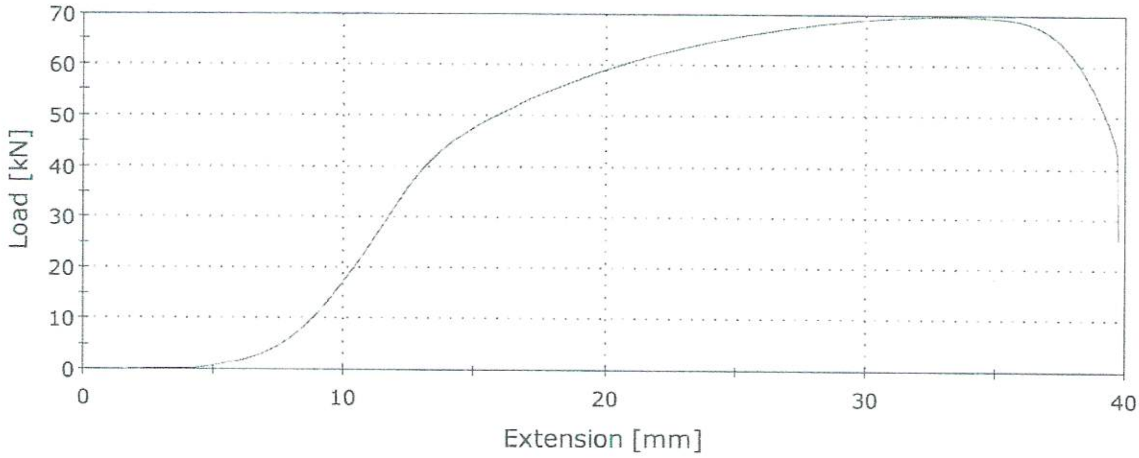
Suhadi, ST
Laboratory Manager

Tuesday, October 19, 2021

PT. HI-TEST

Company	PT. Hanazono Engineering Indonesia
Report No	HT/JKT/1021/0099
Sample/Stamp No	10. HEI 5 - T1

Stress vs Strain

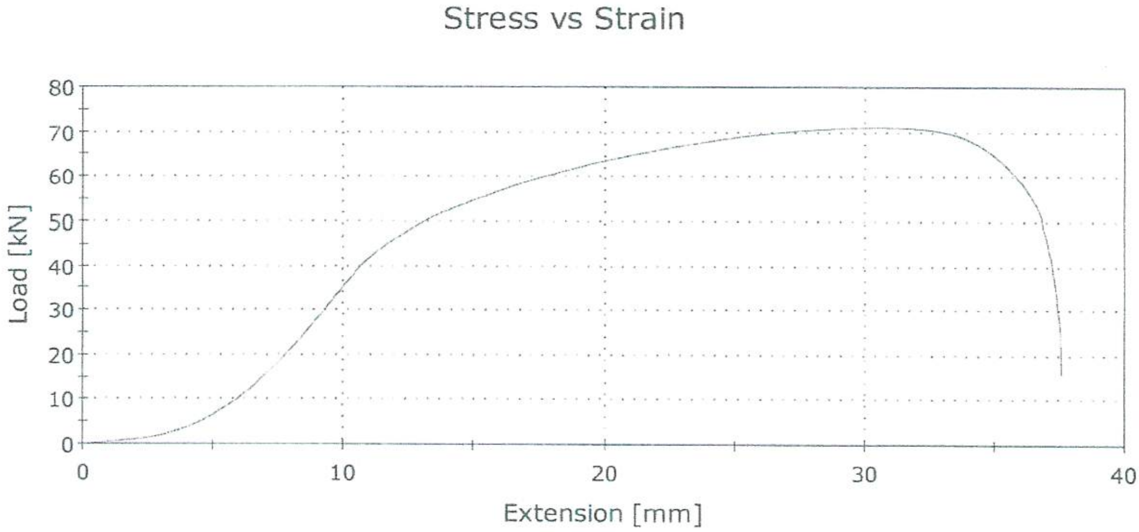


	Specimen label	Thickness [mm]	Width [mm]	Initial Area [mm^2]	Load at Tensile Strength [kN]	Tensile Stress [MPa]
1	10. HEI 5 - T1	8.32	13.48	112.15	69.70	621

Tuesday, October 19, 2021

PT. HI-TEST

Company	PT. Hanazono Engineering Indonesia
Report No	HT/JKT/1021/0099
Sample/Stamp No	10. HEI 5 - T2



	Specimen label	Thickness [mm]	Width [mm]	Initial Area [mm^2]	Load at Tensile Strength [kN]	Tensile Stress [MPa]
1	10. HEI 5 - T2	8.37	13.52	113.16	70.98	627

VO NO.112

SeAH CSS

SeAH Changwon Integrated Special Steel

147 Jeokhyeon-ro, Seongsan, Changwon, Gyeongnam, Korea

INSPECTION CERTIFICATE

CUSTOMER : SAM GANG METAL CO.,LTD.
SUPPLIER : SeAH Changwon Integrated Special Steel
PURCHASE ORDER NO. :

CERT. NO. : 150922-3005
MANUFACTURE NO. : SP0617 PA5011

STEEL GRADE : TP304/304L
SIZE : OD 2 NPS X WT SCH160 X 6000 mm
ARTICLE : SEAMLESS AUSTENITIC STAINLESS STEEL PIPES

SPECIFICATION : ASME SA312
EDITION/ADDENDA : 13 EDITION / NO ADDENDA
STATE OF DELIVERY : SOLUTION TREATMENT
HOT FINISHED, BEVEL

MELTING PROCESS : E.A.F.
V.O.D.
STRAND CASTING

Heat No.		Chemical Composition(wt.%) C	Si	Mn	P	S	Ni	Cr	Non-Metallic Inclusion Test
Spec.	MIN.						8.000	18.000	
	MAX.	.035	1.000	2.000	.0450	.0300	11.000	20.000	
N08283 L		.016	.290	1.658	.0340	.0075	8.120	18.187	
N08283 P		.016	.331	1.706	.0336	.0073	8.188	18.276	

Test No. (Lot No.)		Tensile Properties Y.S.(KSI) 0.2%	T.S. (KSI)	EL. (%)	Hardness Body HRb	Impact Test	Decarburized Depth (mm) TOTAL	FERR.	Grain Size No.
Spec.	MIN.	30.0	75.0	35.0					
	MAX.								
1000-1		47.0	90.0	52.0	80				
1000-2		46.0	88.0	53.0	79				

Additional Tests

Flattening test: GOOD
Hydrostatic test: GOOD (2500PSI)

PT HANAZONO ENGINEERING INDONESIA QC DEPARTMENT

Reviewed By,
KURNIAWAN
SEPT. 12, 2021

Lot No.	Bundle No.	Length (m)	Number of Qt.	Total Length (M)	Weight Kg	Case No.
5P09471000	5P094710001	6	16	96	1,076	
		TOTAL	16		1,076	

Additional Tests / Remarks

HARDNESS ACCORDING TO NACE MR-0175/MR-0103
INSPECTION CERTIFICATE ACC. TO EN 10204 3.1
CORROSION TEST: GOOD (ACC. TO ASTM A262 PRACTICE E)
MATERIAL IDENTITY TEST(PMI) : Good
CERTIFY TO ASTM A312 TP304/304L
HEAT TREATMENT : 1050℃ FOR 10 MIN (WATER COOLING)
NO REPAIRED WELDING
EN 10204 Type 3.1 / NO REPAIR WELDING, FREE FROM MERCURY CONTAMINATION.

Our quality system is certified in accordance with ISO 9001: 2008 by DNV.

We here certify, that the material described above has been tested and complies with the terms of the order contract.

J. K. Lee
Team Manager, Quality Assurance Team
DATE : SEP. 22, 2015

본 품질보증서에 명기된 규격용도외 사용시 안전상 문제가 발생될 수 있으며, 품질보증서 위,변조시 사문서 위조(형법231조)로 불이익을 당하실 수 있습니다.
세아창원특수강 홈페이지(www.seahss.co.kr)에서 품질보증서 원본을 확인할 수 있습니다.

Head Office : Jl. Wibawa Mukti II Kav.1-2 Jati Asih
Bekasi 17423 - Jawa Barat, Indonesia
Phone : +62-21 8243 5561 / 8241 5794
Fax : +62-21 8243 5168
Email : admin@rss.co.id, Website : www.rss.co.id

PT. RIRE SATRIANA SAKTI
Pipe, Vessels & NDT Services

RADIOGRAPHY EXAMINATION REPORT

Client : PT. HANAZONO ENGINEERING INDONESIA	Job No. : -	Report No. : 001/RT/WPS/HEI/IX/21	
Contractor :	Work Order / Request No. : -	Shooting Date : 28-09-2021	
Project : WELDING PROCEDURE QUALIFICATION	Location : W/S PT. HEI-Bojonegara	Date of Report : 29-09-2021	

Radiographic Procedure : RSS/RT-ASME/008	Radiation Source : IR-192	Screen Type : LEAD	SFD : 381 mm / Inch	RT Tech : DWSI ☐ DWDI ☑ SWSI ☐
Application Code : ASME VIII DIV. 1	F/S Source Size : 2.7 x 2.1 mm	Back / Front Thick : 0.125 mm	SSOF : 65 mm / Inch	IQI Type : S. Side ☑ F.Side ☐
Material Specification : SA 333 GR.6 / SA 312 TP 304	Activity : 52 Ci	Double ☐ Single Load ☑	SOD : 318 mm / Inch	Sensitivity : WI No.8 F.Density : 2-4
	Exp. Time : 1.5 Min	Film type : AGFA D7	Penetrameter / IQI : ASTM 1B	Unsharp Geo : 0.48 mm

Identification	Joint No.	Material Size Thick	Film Sequence – Location Marker 4"X10"	4"X15"	7"X17"	Welder Stamp	Surface Indication	Crack	Incomplete Penetration	Incomplete Fusion	Slag Inclusion	Slag Lines	Concavity	Burn Through	Under Cut	Gas and Worm Hole	Porosity	Others	Sensitivity	Image Density	Judgement	Remarks
010/HEI/WPS/MGAS/21	TC-03	Ø 2"	0°			JM 0305													2	2.9-3.4	ACC	
		Sch 160	90°																2	3.0-3.5	ACC	
		8.74 mm																				
011/HEI/WPS/MGAS/21	TC-04		0°																2	2.9-3.4	ACC	
			90°																2	2.9-3.4	ACC	
012/HEI/WPS/MGAS/21	TC-05		0°																2	2.9-3.4	ACC	
			90°																2	3.0-3.5	ACC	

Technician :		Radiographer :	QA/QC Approved :	Authorized Inspector :	CustomerRep. :
Total Welds/Film Used : 3 Joints [4" x 10"] : 6 Sheets [4" x 15"] : Sheets [7" x 17"] : Sheets	Comments :	NDE Level : II Date 29-09-2021 TEGUH. P.	Date : Sept 30. 2021	Date :	Date :

RICR-E2002-11.

PT. voestalpine Böhler Welding Asia Pacific

PT ALLALLOY CAHAYA DYNAWELD
JL. PANTAI INDAH SELATAN KOMP.
KAMAL MUARA, PENJARINGAN
14470 Jakarta Utara
Indonesia

Inspection certificate 3.1

as per : EN 10204
No. : 2021-2047013152-10-20126-025
Rev. 0

PO no.	ACD/AW-N/21/01/0014	of	11.01.2021
Order no.	1042004960		
Delivery note/pos./splitt	2047013152/000000/000010	of	28.02.2021

Product	GTAW rod/wire
Trade name	**BÖHLER TIG 308L**
Standard designation	AWS A5.9 : ER308L ASME SFA5.9 : ER308L

Dimension	2,4 x 1000 mm	118955
Lot no.	20126	68856 JSB2A03W
Quantity	200,0 KG	0425

Chemical composition in % of the product

C	Si	Mn	P	S	Cr	Mo	Ni	Cu	N	FN WRC				
0,02	0,35	1,78	0,010	0,025	19,81	0,03	10,10	0,03	0,09	7				

Mechanical properties EN 10204: 2.2

Tensile test
Specimen preparation
according to : ASTM E8
according to : AWS B4.0

T	ReL / Rp 0,2 MPa	Rp 1,0 MPa	Rm MPa	A (Lo = 4d) %	Z %	WBH PWHT	Remarks
25°C	420		550	40			

Impact test
Specimen preparation
according to : ASTM E23
according to : AWS B4.0

T	Impact energy KV / J	Average KV / J	Lateral expansion mm	Shear fracture %	WBH PWHT	Remarks
-120°C		50				

The product BÖHLER TIG 308L meets the requirements of the filler metal specification ASME sec II, part C, AWS A5.9 : ER308L when tested in accordance with that specification.

Town	Date		Authorized representative
Bekasi	03.03.2021	This certificate was issued by DP-equipment and does not require signature.	Miftah Farid

Reviewed By.
QA/QC
PT HANAZONO ENGINEERING QC DEPARTMENT
Kurniawan
OCT 01, 2021

voestalpine
ONE STEP AHEAD.

Lampiran Kualifikasi Ahli Las No. : 0498/AYG/AL/DMT/2020
Tanggal : 10 NOV 2020

LAPORAN KUALIFIKASI AHLI LAS

Nomor: 06398/AL/DMTS/2020

Menyatakan bahwa Kualifikasi Ahli Las:

Nama	: **JEMANI**
Nomor Registrasi	: TS-451020/23/131778.02
Tempat dan tanggal lahir	: Serang, 03 Mei 1978
Alamat	: Link. Kelapa Baris, RT/RW 007/009 Kec. Pulo Merak, Kota Cilegon
Perusahaan	: **PT HANAZONO ENGINEERING INDONESIA**

Telah dikualifikasi sebagai juru las sesuai dengan:

Nomor WPS	: 003/HEI/MIGAS/20
Nomor PQR	: 003/HEI/MIGAS/20
Standar	: **ASME Section IX – 2019**

Dengan data sebagai berikut:

	Pengujian lapangan	**Batasan kualifikasi**
Proses Pengelasan	GTAW & SMAW	GTAW & SMAW
Sifat Listrik	DCEN & DCEP	DCEN & DCEP
Posisi/Arah Pengelasan	6G / Naik	Sesuai QW-461.9 / Naik
Material Dasar:		
- Desain Sambungan	Single "V" Groove	Sesuai desain sambungan
- Diameter inch (mm)	NPS 2 inch (60,3 mm)	Minimum 25 mm
- Tebal (mm)	8,74 mm GTAW: 2,5 mm SMAW: 6,24 mm	GTAW: Maksimum 5 mm SMAW: Maksimum 12,48 mm
- Spesifikasi Material Uji	SA 312 TP 304L (P No. 8)	Sesuai QW-423
Bahan Pengisi	ER 308L (F No. 6, SFA 5.9) & E 308L-16 (F No. 5, SFA 5.4)	Sesuai QW-433
Gas Pelindung	Argon 99,99% (GTAW)	Argon 99,99% (GTAW)
Backing Gas	Argon 99,99% (GTAW)	Argon 99,99% (GTAW)
Backing / Back Weld	Dengan Backing (SMAW)	Dengan Backing (SMAW)
Jenis Pemeriksaan :		
- Visual	Ya	
- Pemeriksaan Tak Merusak (NDE)	Radiografi	
- Uji Rusak (DT)	-	
- Dan lain-lain	-	

Kualifikasi Ahli Las ini hanya berlaku pada **perusahaan tersebut di atas** sampai dengan tanggal **26 Oktober 2023**. Bila dalam waktu tiga bulan secara terus menerus tidak bekerja sesuai kualifikasinya maka Kualifikasi Ahli Las ini dianggap tidak berlaku lagi.

Diuji oleh:
Inspektur Migas

Christine Samosir, ST
NIP 19890430 201402 2001