

WELDING PROCEDURE SPECIFICATION

WELDING PROCEDURE SPECIFICATION No: **WPS-GASTECH-01** Page 1/2

SUPPORTED BY PROCEDURE QUALIFICATION RECORD No: **PQR-GASTECH-01**

Welding process : GTAW+SAW Type : Manual/Mechanized Joint design : BW/FW

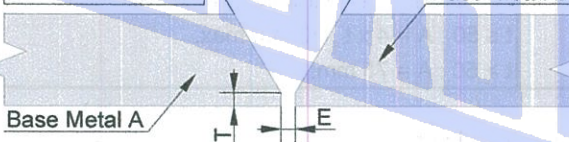
QW-403 Base Metals	NE	Base material: ASTM A240 Gr 304/304L or Equivalent to ASTM A240 Gr 304/304L or Equivalent			
	.11 E	P. Number	8	to	8
	.5 SE	Group Number	Any	to	Any
	.8/.6 E/SE	Thickness range	Groove 5 mm to 28 mm		Fillet All
	.9 E	Pipe Ø range :	Groove All		Fillet All
		Thickness range limitation (t weld > 13mm)	N/A		

QW-402 Joints	.1 NE	Groove design A=60°±10° T=0 to 1.5 mm E=4 ±1mm, B=45°+10°	Preparation method : Machining / Thermal Cutting / Grinding
	.4 NE	Deletion of Backing Not allowed	Tack welds : Process: GTAW
	.5 NE	Addition of Backing Allowed	Location: In groove or bridge
	.10 NE	Root spacing N/A	Removal method Grinding
	.11 NE	Retainers N/A	

WELD PREPARATION

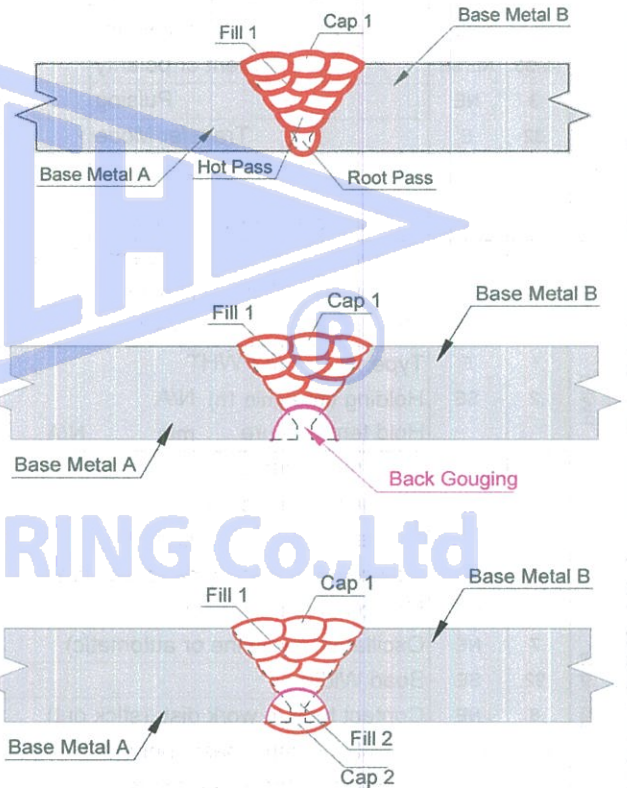
WELDING SEQUENCES / PASS LOCATION

BUTT WELD



GASTECH ENGINEERING Co.,Ltd

Sketches, production drawings, weld symbols, or written description should show the general arrangement of the parts to be fused. Where applicable, the details of the joint groove may be specified.



QW-404 Filler Metals	QW-404			.33/ NE	.12 SE	.4 E	.5 E	.23 E	.50 NE
	Process	Trade name	Manufacturer	Classification	AWS	F-No	A-No	Product form	Flux
	GTAW	KOVET-T308	KOVET	ER 308	A5.9	6	8	Wire	N/A
	SAW	TW-308L/TFS300	TIENTAI	ER308L	A5.9	6	8	Wire	neutral
	.14/.22	E	Welding without filler metal is not allowed			.10/.24	E	Alloy flux/Supplemental	
	.9/.27	NE	Flux-wire class/Alloy Elements			.29	NE	Flux designation	
	.35	NE	Flux-Wire class.			.34/.36	E	Flux type/Recrushed slag	

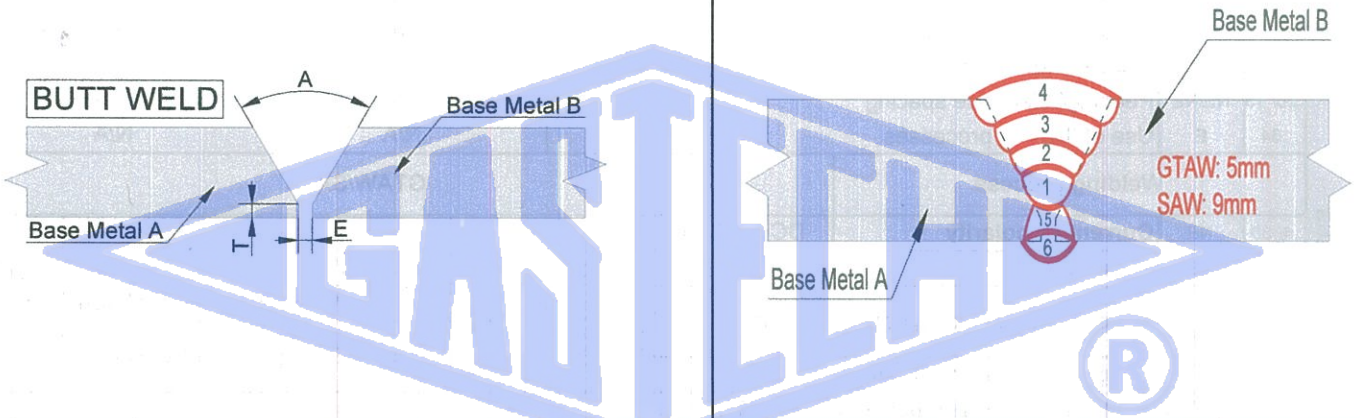


QW-402 Joints	.1	NE	Groove design A=60° T=0.5 mm E=3.5 mm		Preparation method : Machining / Grinding	
	.5	NE	Addition of Backing	N/A		Process: GTAW
	.10	NE	Root spacing	N/A		Location: bridge
	.11	NE	Retainers	N/A		Removal method : Grinding

WELD PREPARATION

WELDING SEQUENCES / PASS LOCATION

Weld



QW-403 Base Metals		NE	Base material: ASTM A240 Gr 304/304L to ASTM A240 Gr 304/304L		
	.5	SE	Group Number 1 to 1	Min. Impact Test applications : N/A	
	.11	E	P-No. Qualified 8 to 8	SE Variable applicable : N/A	
	.6	SE	T Limits Groove 14	Fillet N/A	
	.8	E	T Qualified Groove 14	Fillet N/A	

Pipe Ø range :

Groove

N/A

QW-404 Filler Metals	QW-404				.33/ NE		.12 SE	.4 E	.5 E	.23 E		.50
	Process		Trade name		Manufacturer		Classification	AWS	F-No	A-No	Product form	Flux
	GTAW		KOVET-T308		KOVET		ER 308	A5.9	6	8	Wire	N/A
	SAW		TW-308L/TFS300		TIENTAI		ER308L	A5.9	6	8	Wire	neutral
	Welding process				GTAW		SAW		QW-404 Filler Metals	.14	E	Welding without filler metal is not allowed
			Filler Metal	Trade name	KOVET-T308	TW-308L/TFS300						
	.3	NE		Ø (mm)	2.4	2.4						
	.30	E		Max "t" deposited	5	9						

Welding process

GTAW

SAW

Filler Metal

Trade name

KOVET-T308

TW-308L/TFS300

Ø (mm)

2.4

2.4

Max "t" deposited

5

9

Welding positions

1G

1G

Welding progress

N/A

N/A

Welding without filler metal is not allowed

No Consumable insert

QW-405 Positions	.1	NE	Welding positions		1G	1G
	.3	NE	Welding progress		N/A	N/A
	.30	E				

QW-406 Preheat	.1	E	Preheat T°:	Ambient (30°C)	ISO 13916 : temperature to be measured : t ≤ 50 : A = 4 x t , 50 mm max. t > 50 : A = 75 mm.	
	.2	NE	Min interpass T°:	Ambient (30°C)		
	.3	SE	Maxi interpass T°:	120°C		

QW-408 Gas			Welding process:		GTAW	QW-404 Filler Metals			
	.2	E	Shielding gas	Nature	Ar (99,99%)	.14/.22	E	Welding without filler metal is not allowed	
	.3	NE		Flow rate (l/min)	15 to 20	.9/.27	NE	Flux-wire class/Alloy Elements	-
	.9	E	Backing gas	Nature	N/A	.35	NE	Flux-Wire class. -	
	.5	NE		Flow rate (l/min)	N/A	.10/.24	E	Alloy flux/Supplemental	-
	.10	E	Trailing	Nature	N/A	.29	NE	Flux designation	
	.1	NE		Flow rate (l/mn)	N/A	.34/.36	E	Flux type/Recrushed slag	-

Flow rate (l/min)

N/A

.10/.24

Flow rate (l/mn)

N/A

.29

Flow rate (l/mn)

N/A

.34/.36

Flux designation

-

-

Flux type/Recrushed slag

-

-

	Manufacturer : GAS TECHNICAL AND MECHANICAL ENGINEERING COMPANY LIMITED Add: 2274/9/12 NGUYEN VAN TAO ST, APT 18, HIEP PHUOC COMMUNE, HO CHI MINH CITY, VIETNAM	Stainless Steel Code : ASME IX-2025
	PROCEDURE QUALIFICATION RECORD (PQR)	

PROCEDURE QUALIFICATION RECORD No:	PQR-GASTECH-01	Page 2/2
SUPPORTED TO WELDING PROCEDURE SPECIFICATION No: WPS-GASTECH-01		

QW-410 Technique	Welding process :			GTAW	SAW
	.1	NE	String/Weave method	String & Weave	String
	.3	NE	Orifice, cup or nozzle size	6	N/A
	.5	NE	Method of initial and interpass cleaning	Grinding / Brushing	Grinding / Brushing
	.6	NE	Method of back gouging	N/A	N/A
	.7	NE	Oscillation (Machine or automatic)	N/A	N/A
	.92	SE	Bead Width	max 8 mm	max 18 mm
	.8	NE	Contact tube to work dist. (stick out)	N/A	N/A
	.9/87	NE/SE	Multiple or single pass (per side)	Multiple	Multiple
	.10	SE	Single to multiple electrodes	Single	Single
	.11	E	Vacuum chamber welding	N/A	N/A
	.25	NE	Manual, Automatic, Semi automatic	Manual	Mechanized
	.26/15	NE/NE	Peening/ Electrode spacing	N/A	N/A
	.64	E	Use of thermal processes	N/A	N/A

QW-409 Electrical Characteristics	Welding process			GTAW/SAW					
	.4/.30	NE	Current or polarity	DC (-)/DC(+)	QW-409 Electrical Characteristics	.8	NE	Amperes (A)	See Welding monitoring report
	.3	NE	Pulsing	N/A				Volts (V)	
	.12	NE	Tungsten Electrode (type)	Lanthanated 2%				Welding speed (cm/min)	
			Tungsten Electrode (Ø mm)	2.4		.1	SE	Energy UxIx60/V (kJ/cm)	

TENSILE TESTS (QW-150), Report No: 05/01/26-01./KQTN						
Specimen No.	Width (mm)	Thickness (mm)	Area (mm2)	Ultimate Total Load (KN)	Stress (N/mm2)	Failure and Location
TS1	25.14	14	352	187.3	532	Ductile/Base Metal
TS2	25.32	14	354.5	184.8	521	

GUIDE BEND TESTS (QW-160), Report No: 05/01/26-01./KQTN		
Type and Figure No.	Thickness x Width (mm)	Result
Side Bend 1	14x10.25	Acceptable (no crack)
Side Bend 2	14x10.11	Acceptable (no crack)
Side Bend 3	14x10.34	Acceptable (no crack)
Side Bend 4	14x10.08	Acceptable (no crack)

TOUGHNESS TESTS (QW-170) Report No.: N/A	
FILLET WELD TEST (QW-180) Ref. Report No.: N/A	
Visual Examination : Acceptable , Report: N/A	
Radiographic or Ultrasonic Examination: : Acceptable , Report:	
Deposit Analysis	
Other:	

CERTIFICATE OF COMPLIANCE			
Test Conducted by:	NGUYEN TRONG THAI	Laboratory Test No.	LAS-XD265
Laboratory Agency name:	HOA BINH LAB	Date Test:	5/Jan/2026

We certify that the statements in this record are correct and that the test joints were prepared, fused, and tested in accordance with the requirements of Section IX of the ASME Boiler and Pressure Vessel Code.

Notes :	
1/ E = Essential variable : Can not be changed / SE = Supplementary Essential variable : Can not be change on impact tested welds NE = Non Essential Variable : Guideline, could be changed with QAQC approval, if permitted by Client Specification	

408G	8/Jan/2026	Manufacturer	GTC TECHNICAL CONSULTANCY CO., LTD.
		Prepared by:	Reviewed by: NGUYEN VAN THAO GTC CSWIP 3.2: 348700/2 CWI: 17050871
Rev	Date	Approved by: NGUYEN VAN TRUONG GTC	

NGUYEN VAN TRUONG
DIRECTOR

WELDING MONITORING REPORT

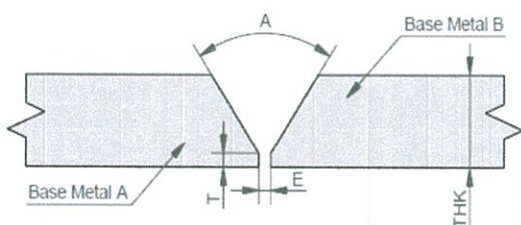
ASME IX-2025

GAS TECHNICAL AND MECHANICAL ENGINEERING COMPANY LIMITED

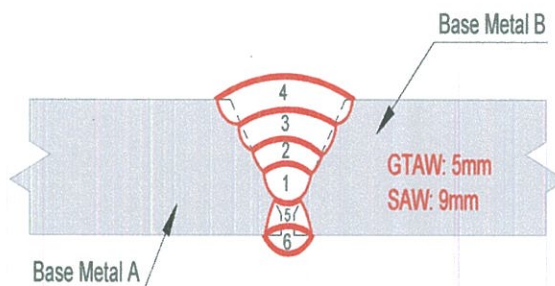
Add: 274/9/12 NGUYEN VAN TAO ST, APT 18, HIEP PHUOC COMMUNE, HO CHI MINH CITY, VIETNAM

PQR no: PQR-GASTECH-01 Support for WPS: WPS-GASTECH-01	Welding Process: GTAW + SAW	Welder Name: DANG THANH TRUNG	Welder Stamp : 094096013935
Clampmeter No. (calibrated machine) Kyoritsu KEW 2055	Thermometer No. FLUKE 62 MAX	Oxygenmeter N° : N/A	Weld Machine S/N°. WSE-400 (GTAW) MZ1000 (SAW)
Shielding Gas: Argon	Backing Gas: Argon	Shield. Gas Flow Rate: N/A	Backing Gas Flow Rate: N/A
Monitored by: GTC TECHNICAL CONSULTANCY CO., LTD.	Position : TPI INSPECTOR	Name : NGUYEN DAC	Signature : _____
			Monitoring Date: 29-Dec-2025

T= 0.5 E= 3.5 A= 60 Bevel: 30



Material: ASTM A240 Gr 304/304L, Plate 14mm



Weld preparation

Welding Sequence

Travel Speed= Length(cm) / Time(min)

Arc Energy= 0,06xVolts(V)xAmps(A) / Travel Speed (mm/min)

Layer / Pass n°	Filler Metal		Interpass Temp. (°C)	Amps (A)	Volts (V)	Weld Length (mm)	Welding Arc Time (min)		Travel Speed (mm/min)	Heat Input (kJ/cm)	Bead Width (mm)	Remark
	AWS Class	Diameter (mm)					Minutes	Second				
Side 1:												
1	ER 308	2.4	ambient (30)	120	12.0	450	10	25	43	2.00	6	
2	ER 308	2.4	80	120	12.0	450	9	30	47	1.82	8	
3	ER308L	2.4	105	300	25.0	450	1	4	422	1.07	14	
4	ER308L	2.4	120	300	25.0	450	1	25	318	1.42	18	
Side 2: after backgouging & grinding												
5	ER308L	2.4	90	300	28.0	450	1	5	415	1.21	6	
6	ER308L	2.4	120	300	28.0	450	1	15	360	1.40	8	

Comments: Consummable, GTAW :
SAW

KOVET-T308
ER308L (TIEN TAI) TW-308L/TFS300

WELDER, WELDING OPERATOR QUALIFICATION TEST CERTIFICATE

Applicable Code/Standard: **ASME Section IX, 2025 Edition**
Employer's name: **GAS TECHNICAL AND MECHANICAL ENGINEERING COMPANY LIMITED**
Address: 274/9/12 NGUYEN VAN TAO ST, APT 18, HIEP PHUOC COMMUNE, HO CHI MINH CITY, VIETNAM

WPQ Certificate number: **WE-GT-26-01**
Welder name: **DANG THANH TRUNG (GT-01)**
Identification number: **094096013935**
Test date: **29-Dec-2025**



Test Description

Identification of PQR followed: **PQR-GASTECH-01**

Revision No.: **0**

☒ Test coupon ☐ Production weld

Specification and type/grade or UNS Number of base material(s): **ASTM A240 Gr 304/304L**

Thickness: **14 mm**

Testing Variables and Qualification Limits

Welding Variables (QW-403)	Actual Values	Range Qualified
Welding process (es)	GTAW+ SAW	GTAW/SAW
Type (i.e.; manual, semi-automatic) used	Manual/Mechanized	Manual/Mechanized
Backing (with/ without)	With	With (for CJP)
☒ Plate ☐ Pipe (enter diameter if pipe or tube)		Plate and Pipe
Base metal P-Number to P-Number	P-No.8 to P-No.8	P-No.1 through P-No.15F
Filler metal or electrode specification(s) (SFA) (info. only)	A5.9	
Filler metal or electrode classification(s) (info. only)	ER 308/ER308L	All
Filler metal F-Number(s)	6	
Consumable insert (GTAW or PAW)	N/A	N/A
Filler Metal Product Form (solid/metal or flux-cored/powder)	-	-
Deposit thickness for each process	-	-
Process 1 GTAW 3 layers minimum ☐ Yes ☒ No	5 mm	Max: 10 mm
Process 2 SAW 3 layers minimum ☒ Yes ☐ No	9 mm	Max: 18 mm
Position qualified (2G, 6G, 3F, etc.) (Table QW-461.9)	1G	Groove: F for Plate & Pipe (OD ≥ 73 mm). Fillet: F; H for Plate and Pipe
Vertical progression (uphill or downhill)	N/A	N/A
Type of fuel gas (OFW)	N/A	N/A
Inert gas backing (GTAW, PAW, GMAW)	N/A	N/A
Transfer mode (Spray/globular or pulse to short circuit-GMAW)	N/A	N/A
GTAW Welding current type/polarity (AC, DCEP, DCEN)	DCEN	DCEN

RESULTS

Visual examination of the completed weld (QW-302.4): **ACCEPTED**

- ☐ Transverse face and root bends [QW-462.3(a)]
☐ Pipe bend specimen, corrosion-resistant overlay [QW-462.5(c)]
☐ Pipe specimen, macro test for fusion [QW-462.5(b)]

☒ Side bends (QW-462.2), Report: **05/01/26-01./KQTN**

- ☐ Plate bend specimen, corrosion-resistant overlay [QW-462.5(d)]
☐ Plate specimen, macro test for fusion [QW-462.5(e)]

Type	Result	Type	Result	Type	Result	Type	Result
-	-	-	-	-	-	-	-

Alternative volumetric examination results (QW-191): RT ☐ or UT ☒

Fillet weld – fracture test (QW-181.2): **N/A**
☐ Fillet welds in plate [QW-462.4(b)] Report:
Other tests: **N/A**

Film or specimens evaluated by: **N/A**

Mechanical tests conducted by: **Nguyen Trong Thai**

Welding supervised by: **Nguyen Duc**

Report No.: **GTC- GT/WPS - UT - 001**

Length and percent of defects: **N/A**

☐ Fillet welds in pipe [QW-462.4(c)]

Company: **N/A**

Laboratory test no.: **HOA BINH LAB (LAS-XD 265)**

We, the undersigned, 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.

GAS TECHNICAL AND MECHANICAL ENGINEERING COMPANY LIMITED	GTC TECHNICAL CONSULTANCY CO., LTD.
Full Name:	Verified by:
Signature:	Approved by:
Date: 14- Jan- 2026	Inspector: BUI VAN THAO GTC CSWIP 3.2: 348700/2 Date: 14- Jan- 2026
	Director: Nguyen Trong Thai GTC Date: 14- Jan- 2026

Date:



CÔNG TY CỔ PHẦN TƯ VẤN THIẾT KẾ KIỂM ĐỊNH XÂY DỰNG HÒA BÌNH

Địa chỉ: Số 964/1 Đường Lò Gốm, Phường Bình Tiên, Tp.Hồ Chí Minh

PHÒNG THÍ NGHIỆM VẬT LIỆU VÀ KIỂM ĐỊNH CÔNG TRÌNH XÂY DỰNG LAS-XD 265

Địa chỉ: 161B/81/2A Lạc Long Quân, Phường Bình Thới, Tp.Hồ Chí Minh

Email: Las265.hoabinh@gmail.com - Hotline: 0937836265 - 0962109262

Số: 05/01/26-02 ./KQTN

PHIẾU KẾT QUẢ THÍ NGHIỆM

Trang: 1/2

Số PYC: 050126-02

PHIẾU KẾT QUẢ THÍ NGHIỆM / TEST REPORT

XÁC ĐỊNH CƠ LÝ VẬT LIỆU THÉP/ DETERMINING MECHANICAL OF STEEL MATERIAL

- Đơn vị yêu cầu / Client : GASTECHNICAL AND MECHANICAL ENGINEERING COMPANY LIMITED

- Địa điểm / Location : 274/9/12 NGUYEN VAN TAO, St, APT 18, HIEP PHUOC COMMUNE, HO CHI MINH CITY, VIET NAM

- P.Pháp thử/ Test method : TCVN 197-2014, TCVN 198-2008, ASME IX_2025

- Thiết bị TN / Test Equipment : Máy kéo -nén- uốn thép WA-1000B, thước lá, cân kỹ thuật, một số dụng cụ khác...

- Ngày nhận mẫu / Recrived : 05/01/2026

- Ngày thí nghiệm / Tested : 05/01/2026

- Tên mẫu/Name of sample : MỐI HÀN THÉP TẮM / WELDING STEEL PLATE
: MẪU QUY TRÌNH HÀN/ PQR NO : PQR-GASTECH-01

: TÊN THỢ HÀN/ WELDER NAME : DANG THANH TRUNG

: MÃ SỐ THỢ HÀN/ WELDER ID : 094096013935

: PHƯƠNG PHÁP HÀN/ WELDING PROCESS :GTAW+SAW

: VẬT LIỆU/ MATERIAL : ASTM A240 Gr. 304/304L

: VỊ TRÍ HÀN/ WELDING POSITION : 1G

: CHIỀU DÀY/ THICKNESS: 14 mm

- Số lượng/Quantity (mẫu) : 01 (Thép tấm : 450x400X14 mm)

Kết quả thí nghiệm xem trang sau / experimental results see next page:

TP.Hồ Chí Minh, ngày 05 tháng 01 năm 2026

CÔNG TY CP TV TK KIỂM ĐỊNH XÂY DỰNG HOÀ BÌNH

ĐD thí nghiệm

Tested by

Nguyễn Trọng Thái

T. Phòng Thí Nghiệm

Laboratory

XD
LAS 265
KS. Nguyễn Ngọc Linh

Tổng Giám Đốc

Director



Nguyễn Việt Chánh

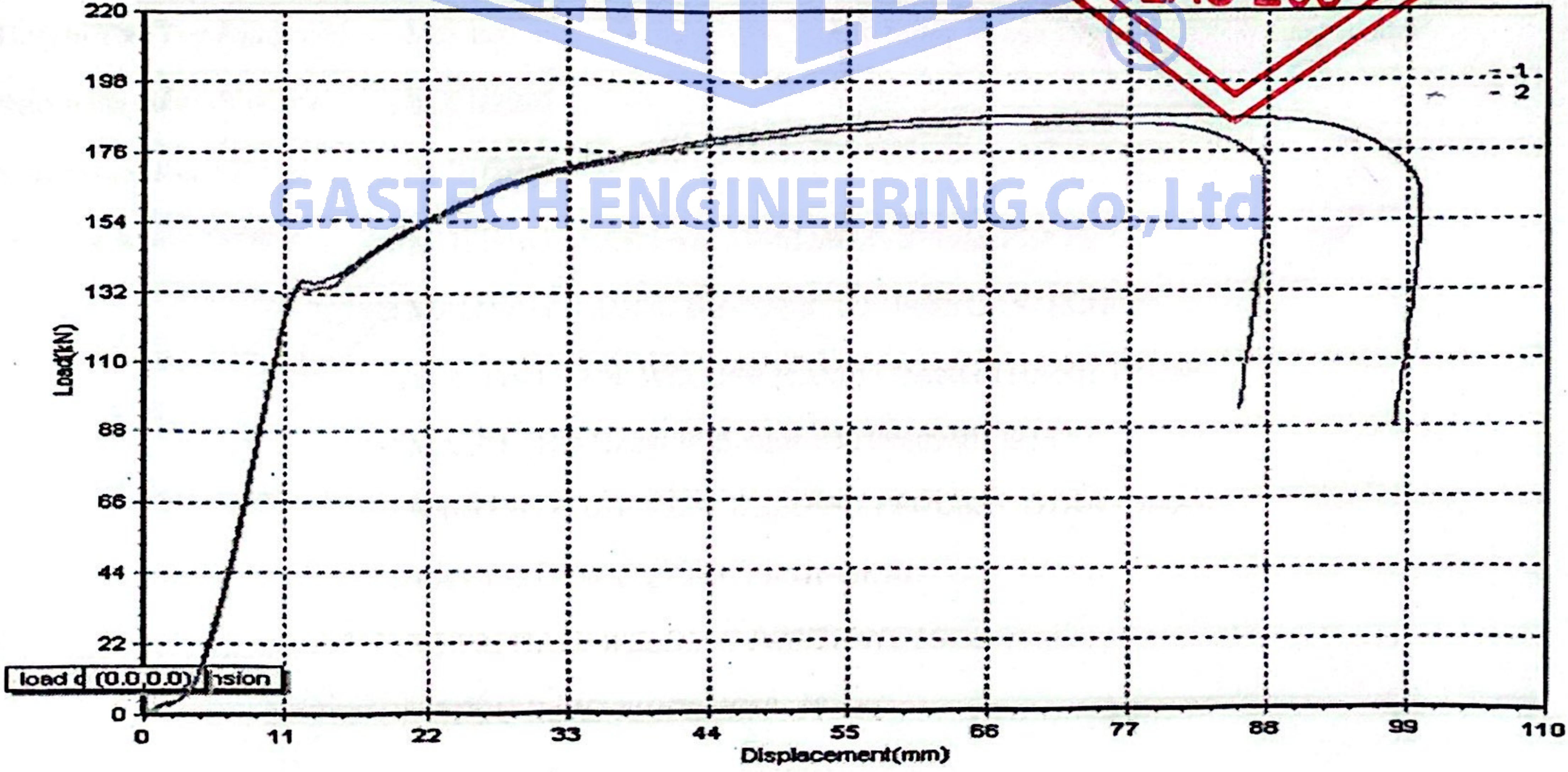
Ghi chú/ Notice

: 1. Mẫu do khách hàng cung cấp, kết quả chỉ có giá trị trên mẫu thử /

Specimens were supplied by client, test result is valid namely submitted specimens only

2 Các thông tin về mẫu, tên công trình, tên khách hàng, hạng mục do khách hàng cung cấp /

Information of specimens , project , client , item , were supplied by client

Số/Ref:...../KQTN		PHIẾU KẾT QUẢ THÍ NGHIỆM TEST REPORT				Trang/Page:.....	
II. KẾT QUẢ THÍ NGHIỆM/ TEST RESULTS (tt):							
STT	Mẫu thép Test Specimen	Mặt cắt ngang	Lực kéo chảy	Giới hạn chảy	Lực kéo đứt	Giới hạn bền	Vị trí bị đứt
No	(Bề dày) x (C. rộng) Thick x Width	Cross Section	Force at yield point	Yield Strength	Maximum force	Tensile Strength	Notice
	mm x mm	(mm ²)	(kN)	(N/mm ²)	(kN)	(N/mm ²)	
1	14.00 x 25.14	352.0	133.52	379	187.3	532	(3)
2	14.00 x 25.32	354.5	132.84	375	184.8	521	(3)
Ghi chú/ Notice: Mẫu được thử nghiệm với sự chứng kiến của các bên liên quan/ Test was witnessed in the presence of Concerned Parties.							
(1) :Đứt tại mối hàn/ Weld Metal (2) :Đứt ở vùng ảnh hưởng nhiệt/ Fractured at heat affected zone (3) Đứt tại vật liệu cơ bản/ Base Metal 							
II. KẾT QUẢ THỬ UỐN NGUỘI / TEST RESULT OF BEND :							
Stt/	Mẫu thử/ Specimen's			Số lượng	Góc uốn	Đường kính gối uốn	Kết quả thử uốn nguội
No	Ký hiệu mẫu	Dày	Rộng	Quantity	Bending angle	Diameter of angle	Test Result of bend
	Sample ID	Thickness	width	Thanh/ Bars	(Độ/ Degree)	(mm)	
1	Side bend	14.00	10.25	1	180°	40	Không Nứt / No Crack
2	Side bend	14.00	10.11	1	180°	40	Không Nứt / No Crack
3	Side bend	14.00	10.34	1	180°	40	Không Nứt / No Crack
4	Side bend	14.00	10.08	1	180°	40	Không Nứt / No Crack