



**P.M.S CO., LTD**  
**'Pioneer Manufacturing & Supply'**

711 Byucksan digital valley, #303, Daedong-ro,  
 Sasang-ku, Busan, Korea  
 TEL : 82-51-713-8300 FAX : 82-51-713-8397

**CERTIFICATE LIST**

**Client : FARNIKAN**  
**Project : HX-127**  
**Shipper : P.M.S**

**Date : 2024. 10. 30**  
**Ref. No. :**  
**P/O. No. : PMS-24-050**

**- DESCRIPTION : TUBESHEET & GIRTH FLANGE, STD FLANGE, BAFFLE, HEAD**  
**APPLICATION NO. : T-401**

**\* ENCLOSED CERTIFICATE**

	PAGE	Ref. No.
Inspection Item List (T-401)	----- ( 1 )	( )
<b>1. TUBESHEET, GIRTH FLANGE</b>		
1) Inspection Certificate	----- ( 2~9 )	( )
2) Ultrasonic Examination Report (UT)	----- ( 10 )	( )
3) Dimension Check Sheet	----- ( 11~16 )	( )
<b>2. STD FLANGE</b>		
1) Inspection Certificate	----- ( 17~23 )	( )
2) Ultrasonic Examination Report (UT)	----- ( 24~25 )	( )
<b>3. BAFFLE</b>		
1) Mill Test Certificate	----- ( 26~27 )	( )
2) Dimension Check Sheet	----- ( 28 )	( )
<b>4. 2:1 HEAD</b>		
1) Mill Test Certificate	----- ( 29~32 )	( )
2) Heat Treatment Report	----- ( 33-34 )	( )
3) Magnetic Particle Examination Report (MT)	----- ( 35 )	( )
4) Dimension Check Sheet	----- ( 36~37 )	( )

**\* REMARKS**

결	담당	팀장	이사	전무	사장
재					

# INSPECTION REPORT



Address : #711 Byucksan Digital Valley  
132-7 Gamjeon-Dong, Sasang-Ku, Busan, Korea

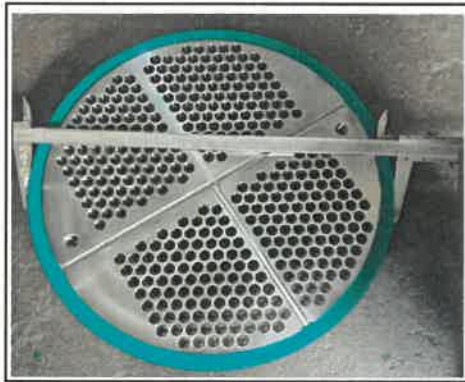
REPORT NO. : T- 401 (PMS-24-050)  
CUSTOMER : FARNIKAN  
PROJECT NO. : HX-127  
INSPECTION DATE : 2024. 10. 30

No.	ITEM	Q'ty	Heat No.	Remark
1	TUBE SHEET, FLANGE, BAFFLE, 2:1 HEAD (See attached "Inspection Item List")	41		
	TOTAL	41		

## Visual & Dimension Inspection



TUBE SHEET



TUBE SHEET



TUBE SHEET



TUBE SHEET



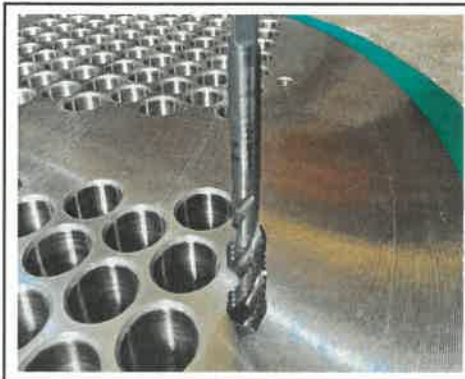
TUBE SHEET



TUBE SHEET



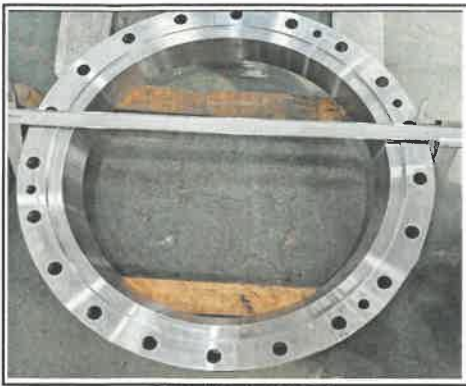
TUBE SHEET



TUBE SHEET



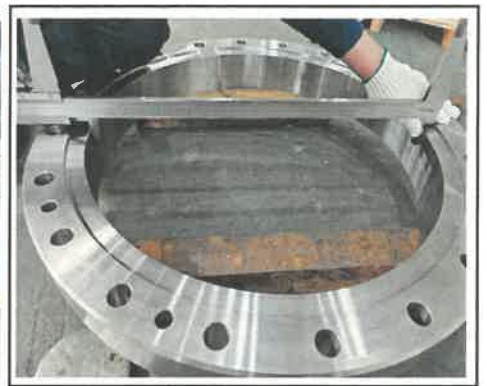
TUBE SHEET



GIRTH FLANGE



GIRTH FLANGE



GIRTH FLANGE



GIRTH FLANGE



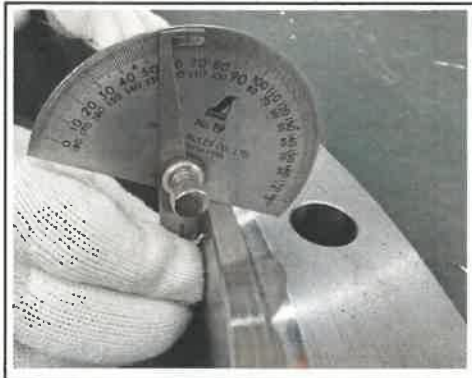
GIRTH FLANGE



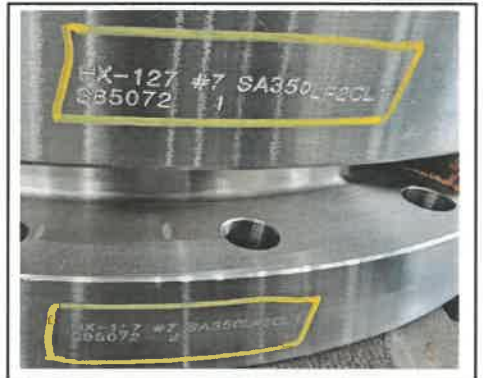
GIRTH FLANGE



GIRTH FLANGE



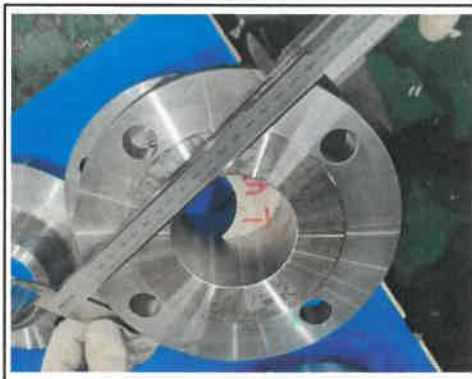
GIRTH FLANGE



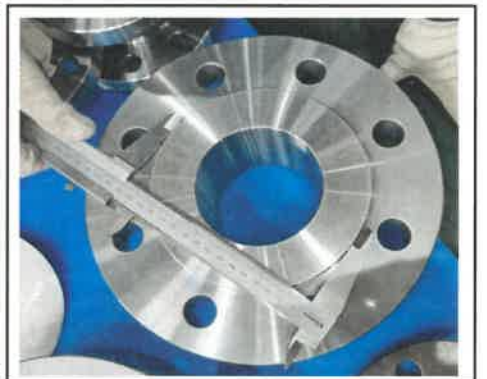
GIRTH FLANGE



STD FLANGE



STD FLANGE



STD FLANGE



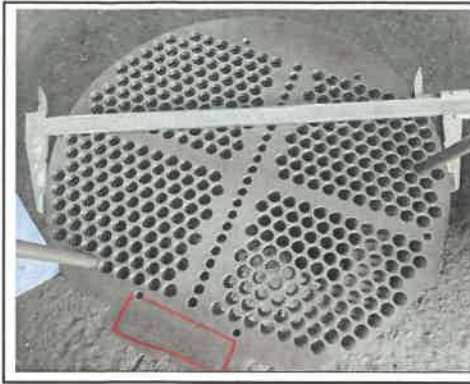
STD FLANGE



STD FLANGE



STD FLANGE



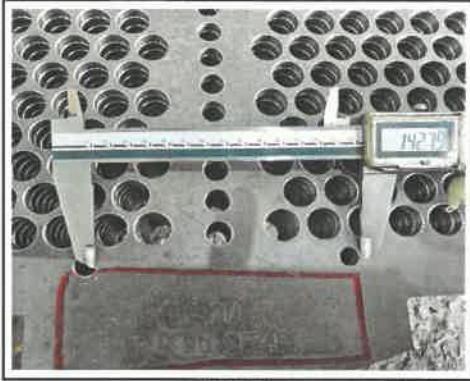
BAFFLE



BAFFLE



BAFFLE



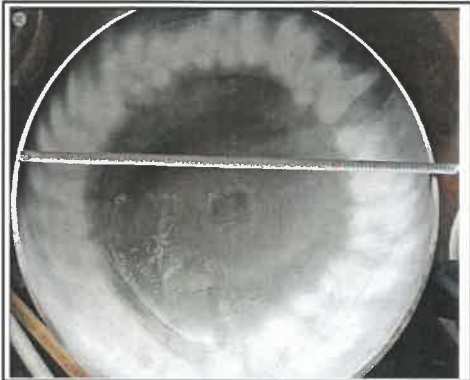
BAFFLE



BAFFLE



BAFFLE



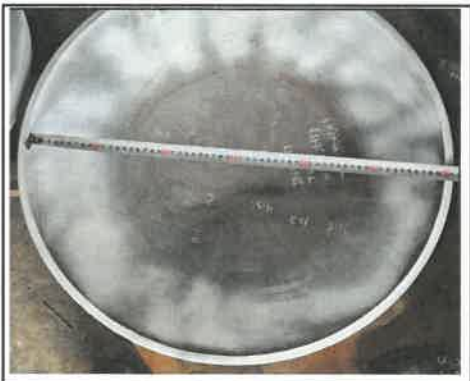
2:1 HEAD



2:1 HEAD



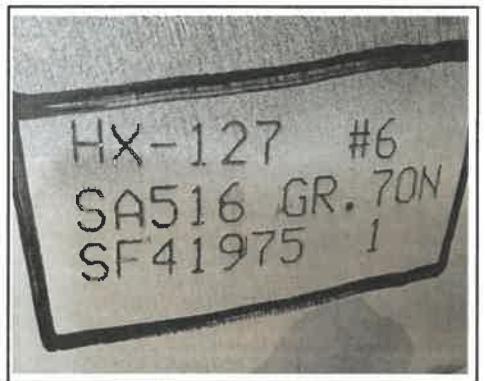
2:1 HEAD



2:1 HEAD



2:1 HEAD



2:1 HEAD

Result	Visual	Good
	Dimension	Good

Remark	
--------	--

INSPECTED BY :	APPROVED BY:
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## Inspection Item List

FPA / HX-127

T- 401

No.	Equip.	Part No.	Item	Material	Description	Q'ty	Heat No.	Remark
1	HX-127	#1	TUBE SHEET	SA350 LF2 CL1	OD 650 x 60T	2	S85072	
2	HX-127	#7	GIRTH FLANGE	SA350 LF2 CL1	OD 760 x ID 600 x 90T	2	S85072	
3	HX-127	#8	GIRTH FLANGE	SA266 Gr.2N	OD 760 x ID 600 x 90T	2	S98858	
4	HX-127	#16	TEST FLANGE	SA266 Gr.2N	OD 760 x ID 600 x 65T	1	S98858	
5	HX-127	T1,2	STD FLANGE	SA105	#150, 3" x S/80, WNRF	4	S09581	
6	HX-127	V	STD FLANGE	SA350 LF2 CL.1	#300, 2"x16.6Tx230L,LWNRF	2	S09581	
7	HX-127	D1,2, LG1,2, S3	STD FLANGE	SA350 LF2 CL.1	#300, 2" x S/160, WNRF	10	S09581	
8	HX-127	PSV	STD FLANGE	SA350 LF2 CL.1	#300, 3" x S/160, WNRF	2	S09581	
9	HX-127	S1	STD FLANGE	SA350 LF2 CL.1	#300, 4" x S/120, WNRF	2	S09581	
10	HX-127	S2	STD FLANGE	SA350 LF2 CL.1	#300, 6" x S/80, WNRF	2	S09581	
11	HX-127		BAFFLE	SA516 Gr.70	OD 595 x 10T	8	SF46385	
12	HX-127	#5	2:1 ELLIP.HEAD	SA516 Gr.70N	ID 925 x Min.12T x SF50	2	WK649236	
13	HX-127	#6	2:1 ELLIP.HEAD	SA516 Gr.70N	ID 600 x Min.10T x SF50	2	SF41975	
TOTAL						41		



# 검사증명서

## MILL TEST CERTIFICATE



당진제철소 : 흥남 당진시 송악읍 북부산업로 1480  
1480 Bukhansanup-ro, Songak-Eup, Dangjin-Si, Chungnam, Korea



주문번호  
Order No. : D240214584

품명  
Commodity : Slab

제품규격  
Specification : ASTM A105-A350LF2

고객사  
Customer : 현대아이에프씨㈜

주문자  
Contractor : 현대아이에프씨㈜

증명서 번호  
Certificate No. : 20240409-CN-0003-001

발행일자  
Date of Issue : 2024-04-09

제품차수 Dimension	수량 Quantity	중량 Weight (kg)	제강번호 Heat No.	제품번호 Product No.	화학성분 Chemical Composition(%)																				
					C	Si	Mn	P	S	Cr	Ni	B	Ca	Cu	Mo	N	Nb	Ti	V	Sr	CEQ				
300x2000x5810	1	27,370	S98847	S98847 04	L	1.918	285	954	117	32	2	2	4	4	2	2	4	4	3	2	4	3	3	3	
300x2000x5830	1	27,460	S98858	S98858 03	L	1.933	288	959	144	18	4	2	3	1	3	2	3	2	23	0	41	1	2	35	357
300x2000x5850	1	27,550	S98859	S98858 52	L	1.933	288	959	144	18	4	2	3	1	3	2	3	1	22	0	45	1	3	27	365
300x2000x5830	1	27,460	S98858	S98858 53	L	1.933	288	959	144	18	4	2	3	1	3	2	3	1	22	0	45	1	3	27	365
*** Sub Total(001) ***					4	109,840(kg)																			
*** Grade Total ***					4	109,840(kg)	Ceq(CEI), C=C+Mn/6+(Ni+C)/15+(Cr+Mo+V)/5																		
*** Lost Item ***																									

606-81-95003

(주)영산엠텍 신진육

부산광역시 강서구 녹산화전로 9(상정동)

제조도매 철강및금속구조재

부부용산 매매, 임대

원본대조필

2024년 9월 0일

SAMBU STAINLESS FORGING CO., LTD.

대표이사 김경

SAMBU STAINLESS FORGING CO., LTD.

Sang-ha, Ju T.+82-51-316-3241

WITNESSED BY  
PMS  
Q.A  
REVIEWED BY

Signature  
Jun. Hee Jeon

Chief Of Steel Making Quality Team

WE HEREBY CERTIFY THAT THE MATERIAL HAS BEEN MADE AND TESTED IN ACCORDANCE WITH THE ABOVE SPECIFICATION AND THE REQUIREMENTS

상기의 제품은 검사와 결과지정된 규격에 합격한 것을 증명합니다.

NOTE

\* 본 검사증명서는 원본인 전자문서(인자시 및 정보 포함)로부터 출력된 사본입니다. 전자문서의 내용은 전자문서와 일치하며, 전자문서와 일치하지 않는 사본은 효력이 없습니다.  
\* This Mill Test Certificate is a copy that has been printed from original electronic document (with digital signature). You are able to check an original electronic document at 'hyundai steel.com/customer portal, http://sm.hyundai-steel.com/cs/cn/login.jsp' \* QRcode scanner App : 'QReal'  
\* [Caution for Use] Damage on products and safety problems may arise if used other than the spec stated in this Mill Test Certificate



N: 910 (X55-hrs AC)



원본대조필

SAMBU STAINLESS FORGING CO., LTD.  
Sangheon, Ju T-82-51-316-3241

PMS	<input type="checkbox"/> WITNESSED BY
Q.A	<input checked="" type="checkbox"/> REVIEWED BY

*[Signature]*



# 검사증명서 MILL TEST CERTIFICATE



당진제철소 : 충남 당진시 송악읍 북부산업로 1480  
1480 Bokusanup-Ro, Songak-Eup, Daejeon-Si, Chungnam, Korea

주문번호 Order No. : D231 009267

품명 Commodity : Slab  
고객사 Customer : 현대아이에프씨㈜

제품규격 Specification : ASTM A105-A950LF2  
주문자 Contractor : 현대아이에프씨㈜

증명서 번호 Certificate No. : 20231024-CN-0003-001

발행일자 Date of Issue : 2023-10-24

제품번호 Product No.	재량 Weight (Kg)	수량 Quantity	제품번호 Product No.	재량 Weight (Kg)	수량 Quantity	화학성분 Chemical Composition (%)																	
						C	Si	Mn	P	S	Cr	Ni	B	Ca	Cu	Mo	N	Nb	Ti	V	Sa -Al	CEQ	
300 x 2000 x 5840	27,510	1	S85072 01	27,510	1	1.963	3	3	4	4	2	2	4	4	3	2	4	3	3	3	3	3	3
300 x 2000 x 5830	27,460	1	S85072 04	27,460	1	1.963	3	3	4	2	2	3	3	1	15	0	44	0	1	3	46	370	370
300 x 2000 x 5830	27,460	1	S85072 05	27,460	1	1.963	3	3	4	2	2	3	3	1	15	0	44	0	1	3	46	370	370
*** Sub Total(001) ***	82,430(Kg)	3		82,430(Kg)	3																		
*** Grade Total ***	82,430(Kg)	3		82,430(Kg)	3																		
*** Last Item ***																							

단위 Unit : 2 : x100 3 : x1,000 4 : x10,000 5 : x100,000

\*\*\* Division - P: Product analysis, L: Ladle analysis

\*\*\* Note \*\*\*

606-81-95003

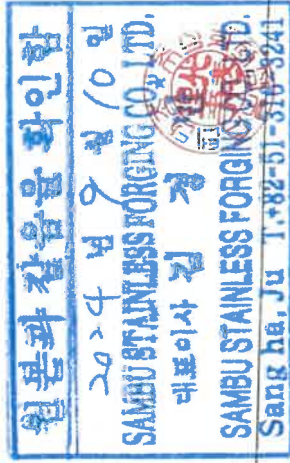
㈜평산엠텍 신진옥

부산광역시 강서구 녹산회전로 93(송정동)

제조·도매 : 평산엠텍  
부품종 : 창간금속구조재



발행인 : 김성진 (인)  
010-7300-4410  
bhj3717 @ pnt.69kr



WITNESSED BY  
PMS  
Q.A.  
PREPARED BY  
J.H.

NOTE

THE SLAB IS FULLY KILLED, FINE-GRAIN PRACTICE, BASIC OXYGEN PROCESS AND VACUUM DEGASSING PROCESS WERE APPLIED.  
ANY WELDING SHALL NOT BE PERFORMED FOR THE ORDERED MATERIAL.  
The Certificate has been issued in compliance with EN 10204 Type 3.1.

WE HEREBY CERTIFY THAT THE MATERIAL HAS BEEN MADE AND TESTED IN ACCORDANCE WITH THE ABOVE SPECIFICATION AND THE REQUIREMENTS

Signature : Ju. Hee Jun  
Chief Of Steel Making Quality Team

\* 본 검사 증명서는 원본인 전자문서(전자서명 정보 포함)로부터 출력된 사본입니다. 전자문서의 내용은 원본과 동일하며, 고객과 동일하게 고해상도에서 확인이 가능하며, 원본과 동일하게 고해상도에서 확인이 가능합니다.  
\* This Mill Test Certificate is a copy that has been printed from original electronic document with digital signature. You are able to check an original electronic document at hyundai-steel.com/customerportal (http://sm.hyundai-steel.com/customerportal) (http://sm.hyundai-steel.com/customerportal) (http://sm.hyundai-steel.com/customerportal) \* QRcode scanner App : 'QReal'  
\* 사본을 취하여 원본 검사 증명서에 열거된 규칙 외 사용시 제품 손상 및 안전장 문제가 발생할 수 있습니다.  
\* [Caution for Use] Damage on products and safety problems may arise if used other than the...

# HEAT TREATMENT REPORT

 <b>SAMBU STAINLESS FORGING CO.,LTD</b> 17,Hwajeonsandan 5-ro 14beon-gil, Gangseo-gu, Busan, Korea Tel : 051)316-3241 Fax : 051)316-3242	REPORT NO	HTR202409-128-001
	ISSUE DATE	2024/09/10
	CUSTOMER	피엠에스(주)

MATERIAL	SA350LF2CL1	HEAT ID NO	SEE BELOW
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DATE OF WORK	2024.09.03		
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JOB NO	SBQ2024090301		
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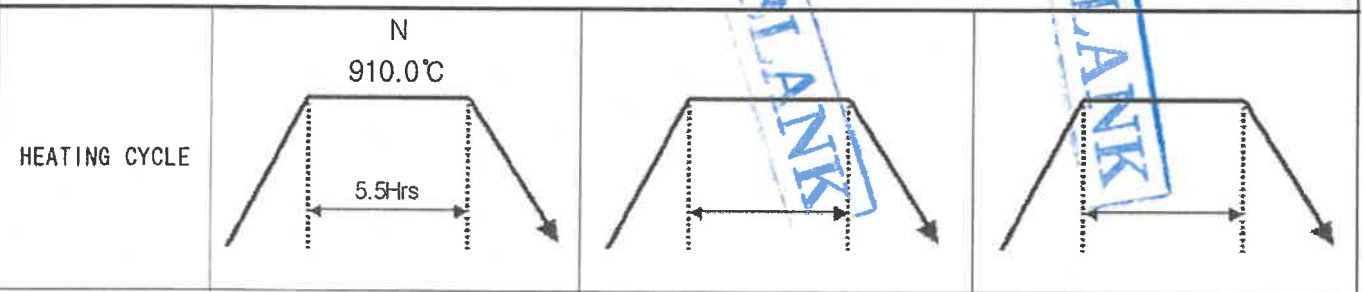
H/T METHOD	N		
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HOLDING TEMP	910.0℃		
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HOLDING TIME	5.5Hrs		
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COOLING METHOD	A.C		
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N:Normalizing, A:Annealing, Q:Quenching, T:Tempering, S:Solution, P:PWHT Simulation, S.R:Stress Relieved, S.T:Stabilization Heat Treatment, A.C:Air Cooled, F.C:Furnace Cooled, W.C:Water Cooled, O.C:Oil Cooled, AC.C:Accelerated Cooled



* Description 0D650*T60 0D760*1D600*T90	2EA 2EA	S85072 S85072	A202408-315-001 A202408-315-002
---	------------	------------------	------------------------------------

\* Remark

PMS	<input type="checkbox"/> WITNESSED BY
	<input checked="" type="checkbox"/> REVIEWED BY
Q.A	

REVIEWED BY   
 WITNESSED BY

\_\_\_\_\_  
 Surveyor

General Manager of QC Dep't

N: 910CK for hrs AC

NO.	DATE	ITEM	QTY	UNIT	REMARKS
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원본대조필  
 SAMBU STAINLESS FORGING CO., LTD.  
 Sambu, Incheon, T. 482-51-316-3241

INSPECTED BY	
Q.A.	<i>[Signature]</i>



# 초음파탐상검사보고서

## Ultrasonic Examination Report

Report No.: BK - PMS - U - 241015 - 01

Page No. : 1 OF 1

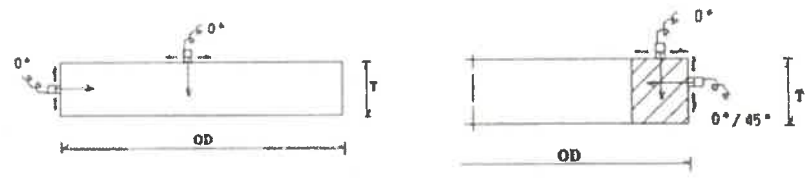
Owner/Customer (주문주/고객) Pioneer Manufacturing & Supply Co., Ltd.	Project Name (공사명) HX127	Project No. (공사번호) T-401
Item Name (제품명) SEE BELOW	Code(규격) : ASME SA388 ASME SEC.VIII DIV.2 PARA. 3.3.4.	Procedure (절차서) NEP(BK)-UT-ASME-001 Rev.1
Item No. (제품번호) SEE BELOW	Drawing No. (도면번호) N / A	Test Time (검사시기) <input checked="" type="checkbox"/> After H.T <input type="checkbox"/> Before H.T
Material (재질) SEE REMARK	Surface Condition (표면상태) <input checked="" type="checkbox"/> As Rough Machined (황삭) <input type="checkbox"/> As Welded	Couplant(접촉매질) <input checked="" type="checkbox"/> Oil(오일) <input type="checkbox"/> Water(물) <input type="checkbox"/> CMC
Maker (제조사) : G E Model (모 델) : USN 60 Control No. (관리번호) : E-20039 Due Date. (유효일자) : 15. Aug. 2025.	Test Method Mode (검사방법) <input checked="" type="checkbox"/> Straight Beam(수직) <input checked="" type="checkbox"/> Angle Beam(사각)	Test Mode (형태) <input checked="" type="checkbox"/> 접촉법(Contact) <input type="checkbox"/> 수침법(Immerse)
	Standard Block(표준시험편) <input checked="" type="checkbox"/> IIW-V1(S/No.:B10265) <input type="checkbox"/> STB-A1(SS)	Reference Block (S/No.) (대비시험편) <input checked="" type="checkbox"/> Back Reference Method <input checked="" type="checkbox"/> 60°V Notch
Equipment Calibration (장비 교정) ASTM E317 FIG1.BLOCK (S/No.:21-1334)	Straight Beam Standard Sensitivity : Back Reference Method (B1: <u>80</u> %)	Straight Beam Scanning Sensitivity Level <u>+6</u> dB Above The Primary Ref' Level
Equipment Linearity (장비 직선성) A.C.L within ±10% / S.H.L within ±5% FSH	Angle Beam Standard Sensitivity : 60° V Notch (DAC: <u>100</u> %)	Angle Beam Scanning Sensitivity Level <u>+6</u> dB Above The DAC Level

Transducer 탐촉자	Type 형태	Angle 교정각도	Frequency 주파수	Size 크기	Type 형태	Angle 교정각도	Frequency 주파수	Size 크기
		TKS2.25CFN (NCGA130)	0°	2.25MHz	Ø1"		°	Mhz
	1C20X22A45 (AAXB47)	45°	1 Mhz	20x22 mm		°	Mhz	

\*UT Condition

Sketch

\*EXAMINATION AREA  
: ENTIRE VOLUME



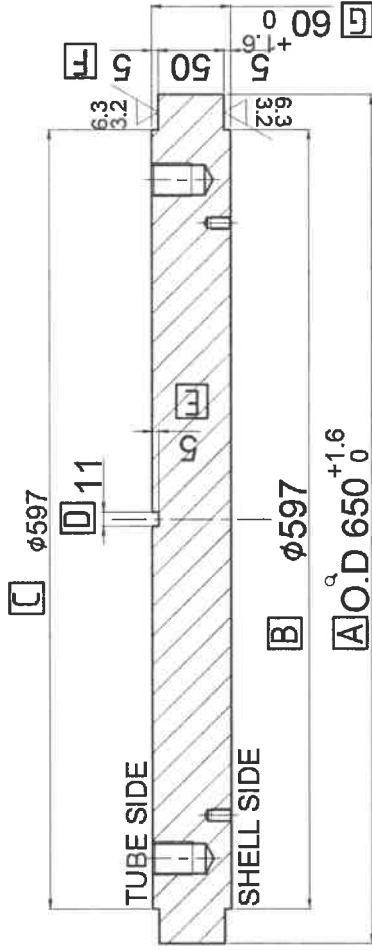
Identification No. 확인번호 (Part No./ Item / Size)	Q.TY 수량	Accept 합격	Reject 불합격	Interpretation 판정	Remark (Heat No.) /Material)
1 (#1) TUBESHEET OD650 x 60T	2EA	V		NO RECORDABLE INDICATION	S85072 / SA350LF2CL.1
2 (#7) GIRTH FLANGE OD760 x ID600 x 90T	2EA	V		"	S85072 / SA350LF2CL.1
3 (#8) GIRTH FLANGE OD760 x ID600 x 90T	2EA	V		"	S98858 / SA266 Gr.2N
4 (#16) TEST FLANGE OD760 x ID600 x 65T	1EA	V		"	S98858 / SA266 Gr.2N
-BLANK-					

SKETCH ON LINE, IF NECESSARY OR  ATTACHED 필요시 실선안에 스케치하거나 또는 첨부할 것.

Examined by 시험자	이인섭 I. S. LEE	LEVEL II	Date of Examination 검사일자 Oct. 15. 2024.	Customer QA Manager
Approved by 승인자	김두진 D. J. KIM	LEVEL III	Date of Report 보고서 일자 Oct. 15. 2024.	
			<input type="checkbox"/> Witnessed by 입회자	
			<input type="checkbox"/> Reviewed by 검토자	

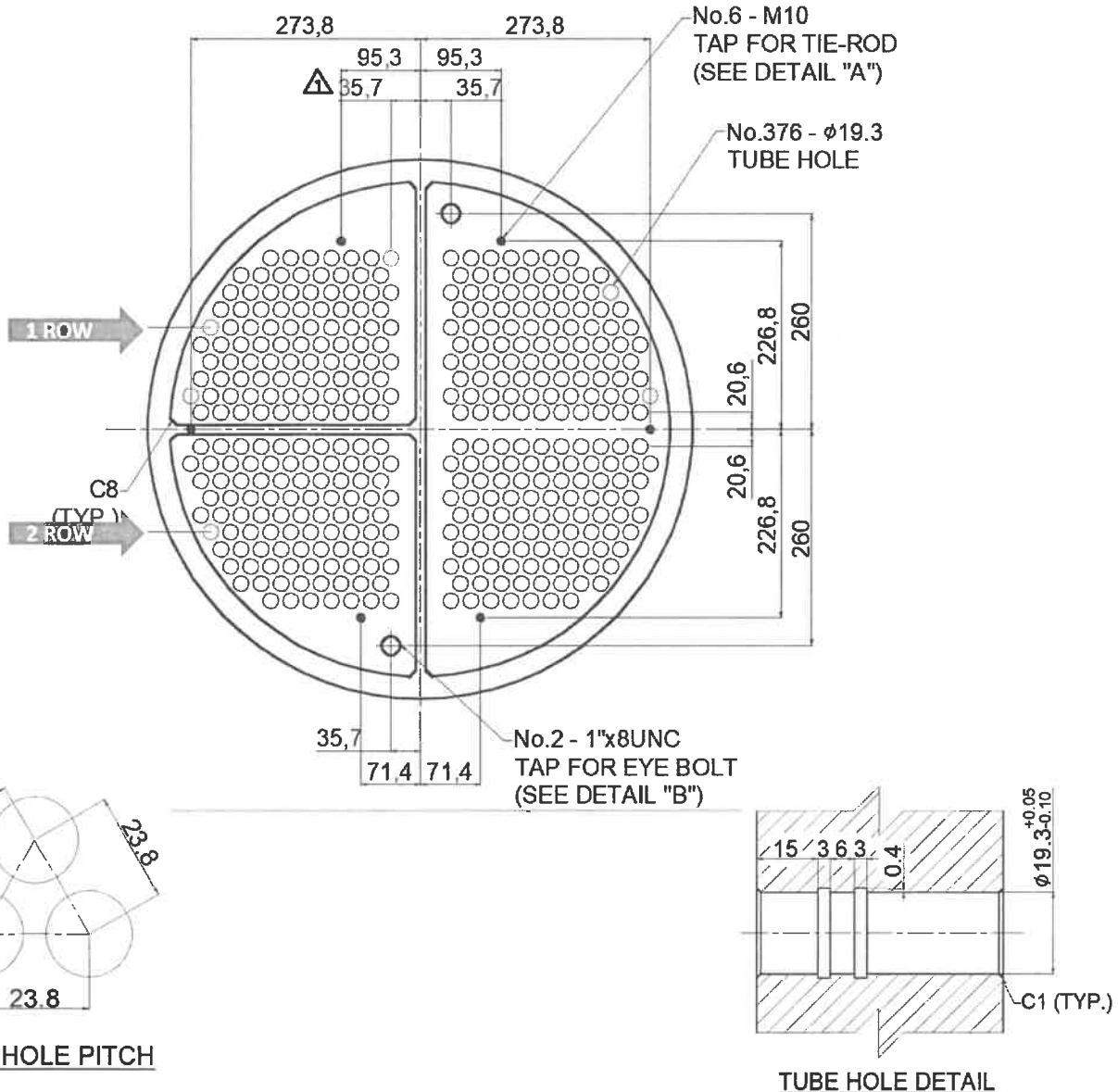
# DIMENSION CHECK SHEET

<b>TITLE</b>	1) TUBE SHEET
<b>DATE</b>	2024-10-30
<b>EQUIP NO.</b>	HX-127
<b>MATERIAL</b>	SA350 LF2CL1
<b>Q'TY</b>	2 EA
<b>HEAT NO.</b>	S85072
<b>HYTIE-ROD TAP</b>	No.6-M10x1.5P
<b>D) EYE BOLT HOLE</b>	No.2-1"x8UNC
<b>REMARK</b>	



# DIMENSION CHECK SHEET

Title	1) TUBE SHEET	Date	2024-10-30
Equipment No.	HX-127	Dwg. No.	
Part No.	#1	Material	SA350 LF2CL1
Q'ty	2 EA	Size	OD 650 x 60T
Hole Size	$\varnothing 19.30 \begin{matrix} +0.05 \\ -0.1 \end{matrix}$	Hole Pitch	$\triangle$ 23.80



TOTAL HOLES : 376 / CHECKED HOLES : 40

Witnessed / Reviewed by  	Approved by : _____ Reviewed by : _____ Prepared by : _____
---------------------------------	---

## DIMENSION CHECK SHEET

Hole Size	$\varnothing 19.30 \begin{matrix} +0.05 \\ -0.1 \end{matrix}$				Hole Pitch			$\triangle$ 23.80		
No.	1		2							
	1 ROW	2 ROW	1 ROW	2 ROW						
1	19.30	19.30	19.30	19.30						
2	19.30	19.30	19.31	19.30						
3	19.30	19.30	19.30	19.30						
4	19.30	19.30	19.30	19.30						
5	19.30	19.31	19.30	19.30						
6	19.31	19.30	19.30	19.30						
7	19.30	19.30	19.30	19.30						
8	19.30	19.30	19.30	19.30						
9	19.30	19.30	19.30	19.30						
10	19.30	19.30	19.30	19.30						
11	19.30	19.30	19.30	19.30						
12	19.30	19.30	19.30	19.31						
13	19.30	19.30	19.30	19.30						
14	19.30	19.30	19.30	19.30						
15	19.30	19.31	19.30	19.30						
16	19.30	19.30	19.30	19.30						
17	19.30	19.30	19.31	19.30						
18	19.30	19.30	19.30	19.30						
19	19.30	19.30	19.30	19.30						
20	19.30	19.30	19.30	19.30						
21										
22										
23										
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31										
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33										
34										
35										

# DIMENSION CHECK SHEET

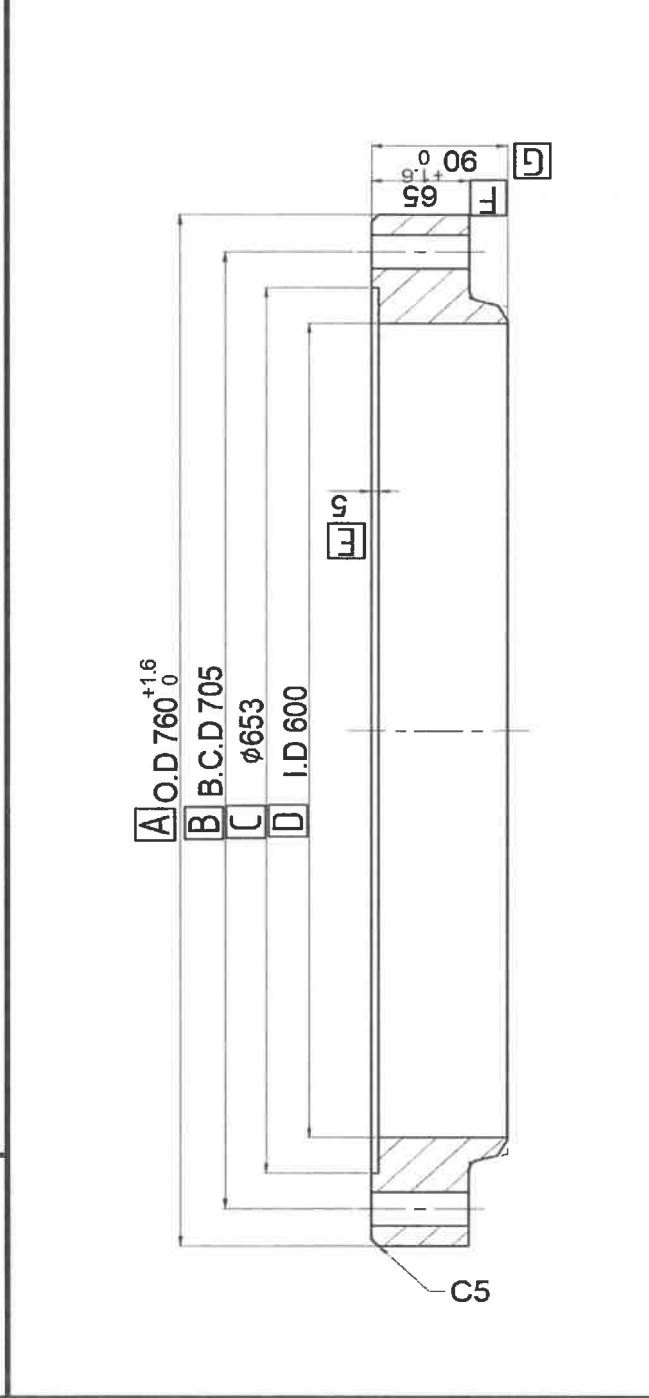
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">TITLE</td> <td>2) GIRTH FLANGE</td> </tr> <tr> <td>DATE</td> <td>2024-10-30</td> </tr> <tr> <td>EQUIP NO.</td> <td>HX-127</td> </tr> <tr> <td>MATERIAL</td> <td>SA350 LF2CL1</td> </tr> <tr> <td>Q'TY</td> <td>2 EA</td> </tr> <tr> <td>HEAT NO.</td> <td>S85072</td> </tr> <tr> <td>H) BOLT HOLE</td> <td>No.20-Ø25</td> </tr> <tr> <td>I) JACK SCREW HOLE</td> <td>No.3-5/8"X11UNC</td> </tr> <tr> <td>REMARK</td> <td></td> </tr> </table>	TITLE	2) GIRTH FLANGE	DATE	2024-10-30	EQUIP NO.	HX-127	MATERIAL	SA350 LF2CL1	Q'TY	2 EA	HEAT NO.	S85072	H) BOLT HOLE	No.20-Ø25	I) JACK SCREW HOLE	No.3-5/8"X11UNC	REMARK	
TITLE	2) GIRTH FLANGE																		
DATE	2024-10-30																		
EQUIP NO.	HX-127																		
MATERIAL	SA350 LF2CL1																		
Q'TY	2 EA																		
HEAT NO.	S85072																		
H) BOLT HOLE	No.20-Ø25																		
I) JACK SCREW HOLE	No.3-5/8"X11UNC																		
REMARK																			

DESCRIPTION	2) OD 760 x 90T										UNIT : mm				
	A	B	C	D	E	F	G	H	I	J		K	L	M	N
CHECK POINT	+1.6	±0.8	±0.4	±0.4	±0.4	+1.6	+1.6								
TOLERANCE	0					0	0								
STANDARD	760.0	705.0	653.0	600.0	5.0	65.0	90.0	20-Ø25	3-5/8"						
MEASUREMENT	1	760.4	705.0	653.1	600.1	65.7	90.1	OK	OK						
	2	760.2	705.0	653.2	600.2	65.5	90.4	OK	OK						
DESCRIPTION															
STANDARD															
MEASUREMENT															
*VISUAL INSPECTION : GOOD															
RESULT : ACCEPT															

<b>Marking : HX-127 #7, SA350 LF2CL1, S85072, 1&amp;2</b>	<b>Inspected by :</b>
<b>Marking :</b>	<b>Approved by :</b> 

# DIMENSION CHECK SHEET

<b>3) GIRTH FLANGE</b>	
<b>TITLE</b>	
<b>DATE</b>	2024-10-30
<b>EQUIP NO.</b>	HX-127
<b>MATERIAL</b>	SA266 Gr.2N
<b>Q'TY</b>	2 EA
<b>HEAT NO.</b>	S98858
<b>H)BOLT HOLE</b>	No.20-Ø25
<b>I) JACK SCREW HOLE</b>	No.3-5/8"X11UNC
<b>REMARK</b>	



DESCRIPTION		3) OD 760 x 90T														UNIT : mm
CHECK POINT	TOLERANCE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	
<b>STANDARD</b>		760.0	705.0	653.0	600.0	5.0	65.0	90.0	20-Ø25	3-5/8"						
<b>MEASUREMENT</b>	1	760.2	705.0	653.1	600.1	5.1	65.5	90.8	OK	OK						
	2	760.4	705.0	653.1	600.2	5.0	65.6	90.6	OK	OK						
<b>DESCRIPTION</b>																
<b>STANDARD</b>																
<b>MEASUREMENT</b>																
<b>*VISUAL INSPECTION : GOOD</b>																
<b>RESULT : ACCEPT</b>																

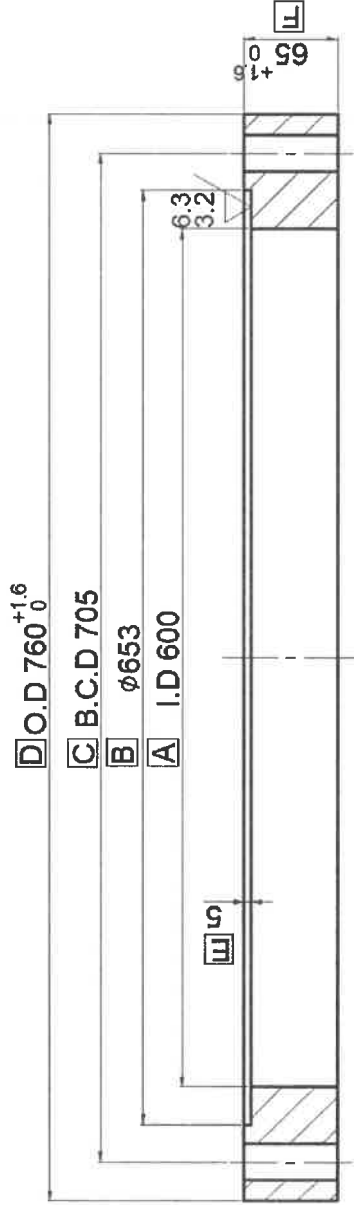
**Marking : HX-127 #8, SA266 Gr.2N, S98858, 1&2**

**Inspected by :** \_\_\_\_\_

**Approved by :**

Pioneer Manufacturing & Supply

# DIMENSION CHECK SHEET



<b>TITLE</b>	4) TEST RING
<b>DATE</b>	2024-10-30
<b>EQUIP NO.</b>	HX-127
<b>MATERIAL</b>	SA266 Gr.2N
<b>Q'TY</b>	1 EA
<b>HEAT NO.</b>	S98858
<b>G)BOLT HOLE</b>	No.20-Ø25
<b>REMARK</b>	

DESCRIPTION	4) OD 760 x 65T							UNIT : mm
CHECK POINT	A	B	C	D	E	F	G	
<b>TOLERANCE</b>	+1.6 0	±0.8	±0.4	±0.4	±0.4	+1.6 0		
<b>STANDARD</b>	760.0	705.0	653.0	600.0	5.0	65.0	20-Ø25	
<b>MEASUREMENT</b>	760.3	705.0	653.1	600.1	5.1	65.7	OK	
<b>DESCRIPTION</b>								
<b>STANDARD</b>								
<b>MEASUREMENT</b>								
<b>*VISUAL INSPECTION : GOOD</b>								
<b>RESULT : ACCEPT</b>								

**Marking : HX-127 #16, SA266 Gr.2N, S98858**

**Inspected by :** \_\_\_\_\_

**Approved by :** \_\_\_\_\_



# CERTIFICATE MATERIAL TEST REPORT

(CERTIFICATE TO EN 10204 3.1)

**SHIN WOO METAL CO., LTD.**  
 10, Hamansandan 3-gil, Gunbuk-myeon,  
 Haman-gun, Gyeongsangnam-do, Korea  
 Tel. : + 82 - 55 - 585 - 2830  
 Fax. : + 82 - 55 - 585 - 2836  
 http://www.ShinWooMetal.net

Certificate No. : SMM-20241016-001  
 Customer : PMS  
 Material : ASME SEC.II PART A SA105N (2023ED)  
 Order NO. : PMS-24-050-12  
 Project Name : HX-127  
 Issued date : October, 16, 2024

Heat No.	Spec	Chemical Composition(%)											UT *5	GOOD	ESU-SM-240926-01			
		C	Si	Mn	P	S	Ni	Cr	Mo	V	Cu	Nb				AL	CEQ	
S09581	Min	0.35	0.10	0.60	-	-	0.30	0.12	0.08	0.40	-	-	-	-	-	-	MT *5	N/A
	Max	0.35	0.35	1.05	0.035	0.040	0.40	0.12	0.08	0.40	-	-	-	-	-	-	PT *5	N/A
	H	0.1877	0.257	0.933	0.0098	0.0030	0.02	0.00	0.001	0.032	0.000	0.030	0.35	-	-	Dimensional	GOOD	
	P															Visual	GOOD	

UT : ASTM A388/ASME Sec.VIII Div.2, Part3, Para.3.3.4

No.	Description or Dimension	Q'ty	Mechanical Properties			*3 Tension Test			Hardness			Impact Test		Bend Test	
			Specification	Y.S MPa	T.S MPa	E.L %	R.A %	Test (HBW)	Test Temp Notch	Minimum	Unit	Radius	Angle		
1.	ASME B16.5 150# WN RF 3" S/80 <div style="text-align: center; border: 2px solid red; padding: 5px; width: fit-content; margin: 0 auto;">BLANK</div>	4 EA	Lot NO I12-01	Min 250	Max -	Min 485	Max -	Min -	Max -	197	1	2	3		
			#1	L 340	L 513	22	30	67	143,144						
			#2												
			#3												

Heat Treatment *4	Normalizing		Tempering		Stabilization	
	910 °C	5.3 hrs	A.C	hrs	°C	hrs

We hereby certify that the material herein has been made and tested in accordance with as above specification and also with the requirement called for the above order.



Note : \*1. H=Heat Analysis, P=Product Analysis  
 \*2. L=Longitudinal, T=Tangential, Tr=Transverse, R=Radial.  
 \*3. Tensile Test : Y.S=Yield Strength(0.2% OffSet), T.S=Tensile Strength, E.L=Elongation, R.A=Reduction of Area.  
 \*4. A.C=Air Cooled, F.C=Furnace Cooled, W.C=Water Cooled, O.C=Oil Cooled  
 \*5. UT : Ultrasonic Examination, MT : Magnetic Examination, PT : Penetrant Testing



# CERTIFICATE MATERIAL TEST REPORT

(CERTIFICATE TO EN 10204 3.1)

**SHIN WOO METAL CO., LTD.**  
 10, Hamansandan 3-gil, Gunbuk-myeon,  
 Haman-gun, Gyeongsangnam-do, Korea  
 Tel. : + 82 - 55 - 585 - 2830  
 Fax. : + 82 - 55 - 585 - 2836  
 http://www.ShinWooMetal.net

Certificate No.: SWM-20241016-002  
 Customer : PMS  
 Order NO. : PMS-24-050-12  
 Project Name : HX-127

Material : ASME SEC.II PART A SA350 LF2 CL1  
 (2023ED)

Issued date : October, 16, 2024

Page : 1 of 1

Heat No.	Spec	Chemical Composition(%)											UT #5	GOOD	ESJ-SM-240926-01		
		C	Si	Mn	P	S	Ni	Cr	Mo	V	Cu	Nb				AL	CEQ
S09581	Min	0.30	0.15	0.60	-	-	-	-	-	-	-	-	-	-	-	-	-
	Max	0.30	0.30	1.35	0.035	0.040	0.40	0.30	0.12	0.08	0.40	0.02	0.02	0.35	0.000	0.030	N/A
	H	0.1877	0.257	0.933	0.0098	0.0030	0.02	0.02	0.00	0.001	0.032	0.000	0.030	0.35	0.000	0.030	N/A
	P																GOOD

▶ Remark Heat treatment report No. : SWH-20241016-002  
 MPS No. : M24-050-13SF Rev.0

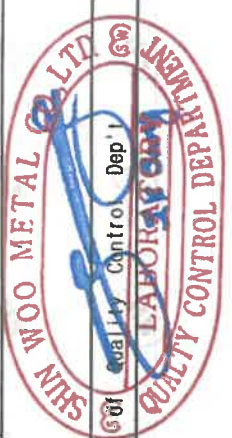
UT : ASTM A388/ASME Sec.VIII Div.2, Part3, Para.3.3.4

No.	Description or Dimension	Q'ty	Mechanical Properties			Tension Test			(Φ12.5×50L)			Hardness		Impact Test		Bend Test	
			Specification	Lot NO	Y.S	T.S	E.L	R.A	Test (HBW)	Test Temp	Notch	Minimum	Unit	Radius	Angle		
2.	ASME B16.5 300# LWN RF 2" L/230	2 EA	Min	250	485	22	30	-	197	16	1	2	3	20			
3.	ASME B16.5 300# WN RF 2" S/160	10 EA	Max	-	655	-	-	-	-	-	-	-	-	-	-	-	-
4.	ASME B16.5 300# WN RF 3" S/160	2 EA	L	340	513	30	67	143,144	143,144	68	70	59	65.6				
5.	ASME B16.5 300# WN RF 4" S/120	2 EA															
6.	ASME B16.5 300# WN RF 6" S/80	2 EA															
	<b>BLANK</b>																

Heat Treatment #4	Normalizing		Tempering		Stabilization	
	910 °C	5.3 hrs	A.C	hrs	hrs	hrs

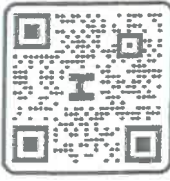
We hereby certify that the material herein has been made and tested in accordance with as above specification and also with the requirement called for the above order.

WITNESSED BY  
 REVIEWED BY  
 PMS Q.A. *Qual*



Manager Quality Control Dept.

Note : \*1. H=Heat Analysis, P=Product Analysis  
 \*2. L=Longitudinal, T=Tangential, Tr=Transverse, R=Radial.  
 \*3. Tensile Test : Y.S=Yield Strength(0.2% OffSet), T.S=Tensile Strength, E.L=Elongation, R.A=Reduction of Area.  
 \*4. A.C=Air Cooled, F.C=Furnace Cooled, W.C=Water Cooled, O.C=Oil Cooled.  
 \*5. UT : Ultrasonic Examination, MT : Magnetic Examination, PT : Penetrant Testing



**HYUNDAI STEEL**

당진제철소 : 중남 당진시 송악읍 북부신입로 1480  
1480 Bukbusanup-Ro, Songak-Eup, Dangjin-Si, Chungnam, Korea

**검사증명서**  
MILL TEST CERTIFICATE

주문번호  
Order No. : D211103880

품명  
Commodity : Slab  
고객사  
Customer : (주)웅산엠텍

제품규격  
Specification : ASTM A105-A350(F2)  
주문자  
Contractor : 현대이아이에프씨 주식회사

증명서 번호  
Certificate No. : 20211118-CN-0013-002

발행일자  
Date of Issue : 2021-11-18

재질처수 Material	수량 Quantity	중량 Weight (kg)	세강번호 Heat No.	제품번호 Product No.	화학성분 Chemical Composition(%)												
					단위 Unit		2 : x 100		3 : x 1,000		4 : x 10,000		5 : x 100,000				
Division	C	Si	Mn	P	S	Cr	N	B	Ca	Cu	Mo	Ni	Nb	Ti	V	Sr	CEQ
L	1.877	257	933	96	30	2	2	3	3	32	0	35	0	1	1	30	351

\*\*\* Slab Total(QTY) \*\*\* 1 27,460(Kg)  
\*\*\* Grade Total \*\*\* 2 54,370(Kg) Ceq(CEV): G = C + Mn/16 + (Ni + Cu)/15 + (Cr + Mo + V)/5  
\*\*\* Lot Item \*\*\*

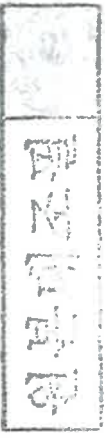
606-81-95003

(주)웅산엠텍 신진옥  
부산광역시 강서구 독산화전로 93(송정동)  
계조도매 철강및금속구조재  
부동산 매매, 임대



**CERTIFIED TRUE COPY**

ACCEPT REJECT  
REVIEWED BY SWITNESSED BY  
Shinwoo Metal Co., Ltd.



비허가거래 (주)이노 120 44/0

\* Division - P: Product analysis, L: Ladle analysis  
\* THE SLAB IS FULLY KILLED, FINE-GRAIN PRACTICE. BASIC OXYGEN PROCESS AND VACUUM DEGASSING PROCESS WERE APPLIED.  
\* ANY WELDING SHALL NOT BE PERFORMED FOR THE ORDERED MATERIAL.  
\* The Certificate has been issued in compliance with EN 10204 Type 3.1

WE HEREBY CERTIFY THAT THE MATERIAL HAS BEEN MADE AND TESTED IN ACCORDANCE WITH THE ABOVE SPECIFICATION AND THE REQUIREMENTS.  
신기의 제품은 검사의 결과 지정된 규격에 합격한 것을 증명합니다.  
Signature: Y.H Kim  
Chief Of Quality Assurance Team

\* 본 검사증명서는 원본인 전자문서(전자서명 정보 포함)로부터 출력된 사본입니다. 전자문서의 내용은 인쇄본과 고객포털에서 확인하실 수 있습니다. (http://sm.hyundai-steel.com/cs/cm/login.jsp)  
\* This Mill Test Certificate is a copy that has been printed from original electronic document (with digital signature). You are able to check an original electronic document at Hyundai Steel's customer portal (http://sm.hyundai-steel.com/cs/cm/login.jsp) \* DRcode scanner App : 'DRReal'  
\* [사용상 주의사항] 본 검사증명서에 영기된 규격 외 사용시 제품안전 및 안전성 문제가 발생할 수 있습니다.  
\* [Caution for Use] Damage on products and safety problems may arise if used other than the spec stated in this Mill Test Certificate.

# HEAT TREATMENT REPORT



**SHIN WOO METAL CO., LTD.**  
 #10, HAMANSANDAN 3-GIL, GUNBUK-MYEON,  
 HAMAN-GUN, GYENGSANGNAM-DO, KOREA

Tel. : 055-585-2830 Fax. : 055-585-2836

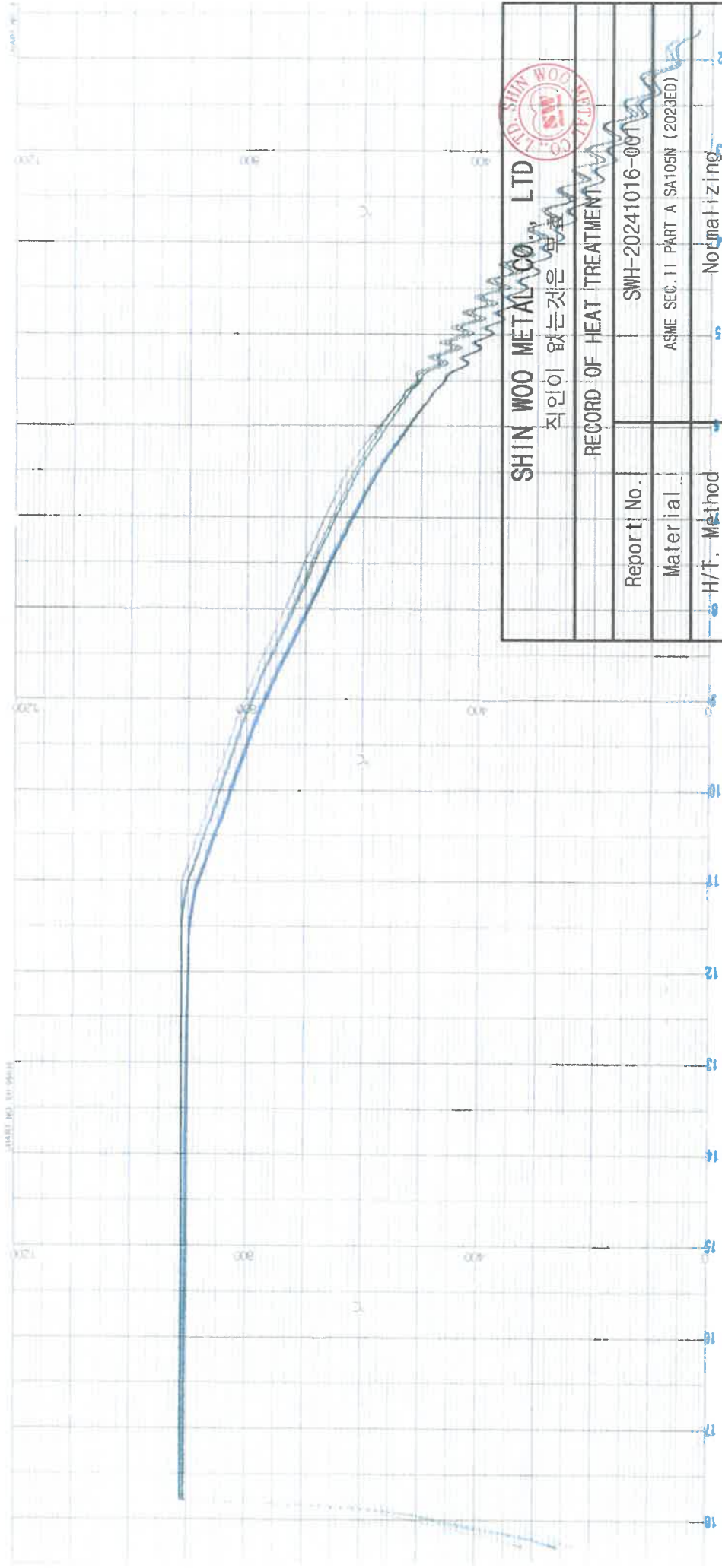
Page : 1 of 1  
 Report No. : SWH-20241016-001  
 Order No. : PMS-24-050-12  
 Issued Date : October, 16, 2024

Customer : PMS	Heating No. : SH24-112
Material : ASME SEC.II PART A SA105N (2023ED)	Date Of Work : 20240912
Heat No. : S09581	Job No. : 33-2408-18

No.	Description or Dimension	Q'ty	HEAT TREATMENT METHOD				HEATING CYCLE	
			<input checked="" type="checkbox"/> Normalizing <input type="checkbox"/> Quenching <input type="checkbox"/> Solution <input type="checkbox"/> Tempering <input type="checkbox"/> Annealing <input type="checkbox"/> Stabilization	HOLDING TEMP.	HOLDING TIME	COOLING METHOD	HEATING CYCLE	HEATING CYCLE
1	ASME B16.5 150# WN RF 3" S/80 <div style="border: 2px solid red; padding: 5px; display: inline-block; color: red; font-weight: bold; font-size: 1.2em;">BLANK</div>	4 EA	<input checked="" type="checkbox"/> Normalizing <input type="checkbox"/> Quenching <input type="checkbox"/> Solution	910 °C	5.3 hrs	A.C		
HARDNESS DATA.								
NO.	x1	x2	x3	x4				
1	143	144						
2								

Remark   	<table border="1" style="margin: auto;"> <tr> <td style="padding: 2px;">PMS</td> <td style="padding: 2px;"><input type="checkbox"/> WITNESSED BY</td> </tr> <tr> <td style="padding: 2px;">Q.A</td> <td style="padding: 2px;"><input checked="" type="checkbox"/> REVIEWED BY</td> </tr> <tr> <td colspan="2" style="text-align: right; padding: 2px;"> </td> </tr> </table>	PMS	<input type="checkbox"/> WITNESSED BY	Q.A	<input checked="" type="checkbox"/> REVIEWED BY			
PMS	<input type="checkbox"/> WITNESSED BY							
Q.A	<input checked="" type="checkbox"/> REVIEWED BY							
		Manager of Quality Control Dep't						

# HEAT TREATMENT CHART



SHIN WOO METAL CO., LTD.  
 직인이 없는것은 부호

## RECORD OF HEAT TREATMENT

Report No.	SWH-20241016-001
Material	ASME SEC. II PART A SA105N (2023ED)
H/T. Method	Normalizing
Customer	PMS
Job No.	33-2408-18
Heat No.	S09581
Q'ty	4 EA
Date of Work	2024-09-12

PMS	<input type="checkbox"/> WITNESSED BY
Q.A	<input checked="" type="checkbox"/> REVIEWED BY

*[Signature]*

# HEAT TREATMENT REPORT



**SHIN WOO METAL CO., LTD.**  
 #10, HAMANSANDAN 3-GIL, GUNBUK-MYEON,  
 HAMAN-GUN, GYENGSAANGNAM-DO, KOREA

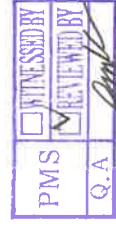
Tel. : 055-585-2830 Fax. : 055-585-2836

Page : 1 of 1  
 Report No. : SWH-20241016-002  
 Order No. : PMS-24-050-12  
 Issued Date : October, 16, 2024

Customer : PMS	Heating No. : SH24-112
Material : ASME SEC. II PART A SA350 LF2 CL1 (2023ED)	Date of Work : 20240912
Heat No. : S09581	Job No. : 33-2408-18

No.	Description or Dimension	Q'ty	HEAT TREATMENT METHOD			HEATING CYCLE	
			<input checked="" type="checkbox"/> Normalizing <input type="checkbox"/> Quenching <input type="checkbox"/> Solution <input type="checkbox"/> Tempering <input type="checkbox"/> Annealing <input type="checkbox"/> Stabilization	HOLDING TEMP.	HOLDING TIME	COOLING METHOD	TEMP.
2	ASME B16.5 300# LWN RF 2" L/230	2 EA		910 °C	5.3 hrs	A.C	
3	ASME B16.5 300# WN RF 2" S/160	10 EA					
4	ASME B16.5 300# WN RF 3" S/160	2 EA					
5	ASME B16.5 300# WN RF 4" S/120	2 EA					
6	ASME B16.5 300# WN RF 6" S/80	2 EA					
<b>BLANK</b>							
			HARDNESS DATA.				
	NO.	x1	x2	x3	x4		
	1	143	144				
	2						

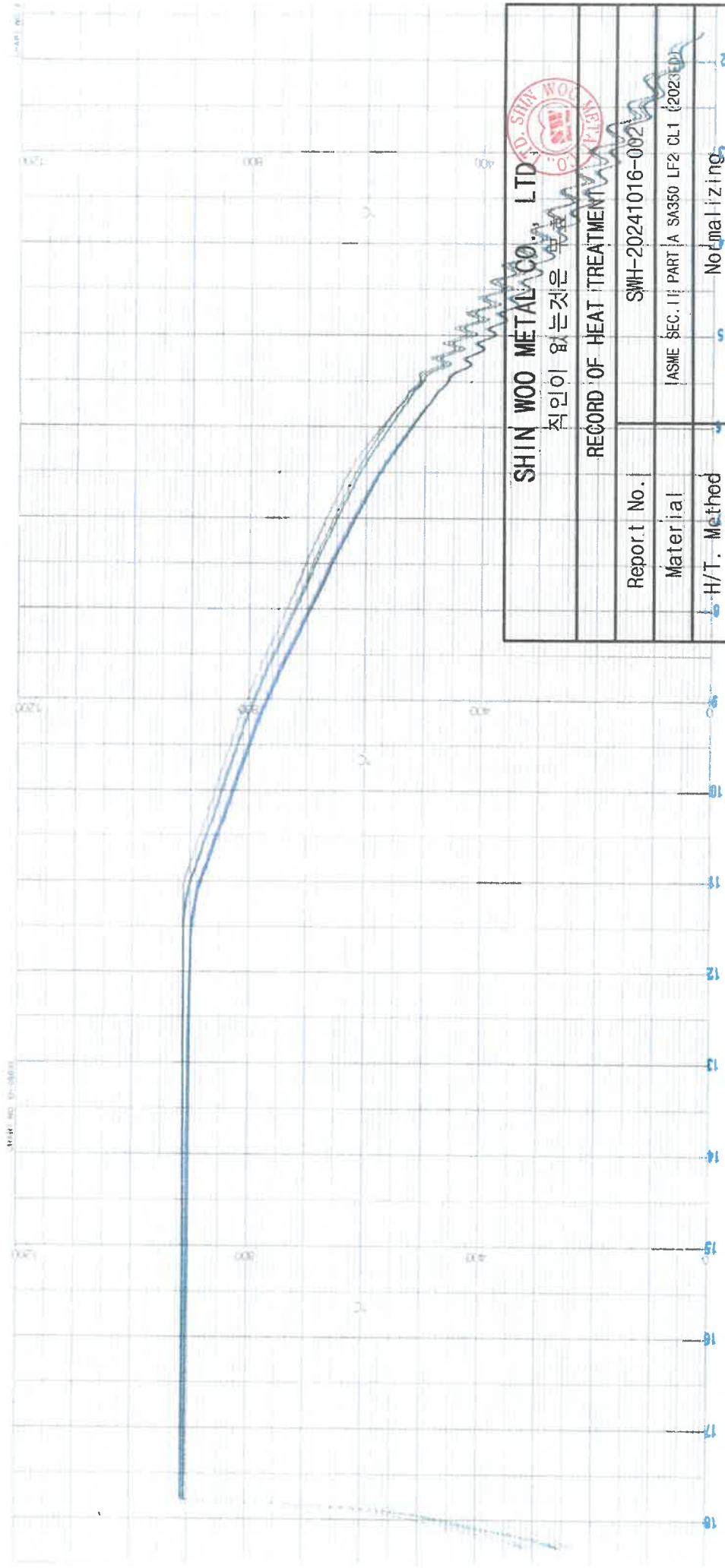
▶ Remark



*SK Jung*

Manager of Quality Control Dept't

# HEAT TREATMENT CHART



<b>SHIN WOO METAL CO., LTD.</b> SHIN WOO METAL CO., LTD. SHIN WOO METAL CO., LTD.	
책임이 없는 것은 부호 RECORD OF HEAT TREATMENT	
Report No.	SWHT-20241016-002
Material	IASME SEC. II PART A SA350 LF2 CL1 (2023ED)
H/T. Method	Normalizing
Customer	PMS
Job No.	33-2408-18
Heat No.	S09581
Q'ty	18 EA
Date of Work	2024-09-12

PMS <input type="checkbox"/> WITNESSED BY	Q.A. <input checked="" type="checkbox"/> REVIEWED BY <i>[Signature]</i>
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**ULTRASONIC EXAMINATION REPORT**  
**초음파탐상검사보고서**

보고서번호 Report No.  
 ESU-SM-240926-01  
 시험날짜 Date of Exam  
 2024. 09. 26  
 페이지번호 Page No.  
 1 of 2

주문주/고객 Owner/Customer P.M.S CO.,LTD	공사번호/공사명 Project No./Name HX-127 (+PO No. : PMS-24-050-12)
제품번호/제품명 Item No./Name FLANGE	도면번호 / Drawing No. N / A
적용 규격 App. Code ASTM A388 / ASME SEC.VIII DIV.2 PART3 PARA 3.3.4	적용 절차서번호 App.Procedure No. Rev.No N / A

두께 Thickness <input type="checkbox"/> mm SEE BELOW <input type="checkbox"/> inch	재질 / Material SEE REMARKS	용접방법 Weld Method <input type="checkbox"/> SMAW <input type="checkbox"/> SAW <input type="checkbox"/> FCAW <input type="checkbox"/> GTAW
---	------------------------------	--

표준시험편 Standard Block IIW-V1	검사시기 Examination Time After Rough Machined	표면조건 Surface Condition <input type="checkbox"/> As Welded <input type="checkbox"/> As Ground <input checked="" type="checkbox"/> As Machined
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장비 Equipment	탐촉자 Probe					교정시험편 Calibration Block		
ID No. :	Maker	Model	MHz	Size	Angle	Serial No.	Type	Serial No.
EU-EC-01	KDE	SZ2.25-1	2.25	Ø1 inch	0°	2Z1-007	IIW-V1	L01229
Model : USN 60 SW								
Maker : GE								
Serial No.: 01X5P7								
Due Date : 2025. 01. 01								

직선성 Screen Height Linearity : Within ± 5 %	증폭성 Amplitude Control Linearity : Within ± 10 %
--	---

Setting Sensitivity Method (감도설정방법)				시험온도 Test Temp.
Probe (탐촉자)	Method (방법)	Standard (표준감도)	Scanning (주사감도)	28 °C
SZ2.25-1	Back Ref	80%	+6dB	접촉매질 Couplant <input type="checkbox"/> C.M.C <input type="checkbox"/> Glycerine <input checked="" type="checkbox"/> Oil

\* EXAMINATION AREA : ENTIRE VOLUME

PMS  
 WITNESSED BY  
 REVIEWED BY  
 Q.A.

ShinWoo Metal Q.C Dep't  
 Witnessed by  
 Reviewed by

확인번호 Identification No. (Item / Size)	수량 QTY	합격 Accept	불합격 Reject	평가 Interpretation	비고 Remarks (Material)
1 ASME B16.5 150# WNRF 3" S/80	4EA	V		NO RECORDABLE INDICATION	SA105N
2 ASME B16.5 300# LWNRF 2" L/230	2EA	V		NO RECORDABLE INDICATION	SA350 LF2 CL1
3 ASME B16.5 300# WNRF 2" S/160	10EA	V		NO RECORDABLE INDICATION	SA350 LF2 CL1
4 ASME B16.5 300# WNRF 3" S/160	2EA	V		NO RECORDABLE INDICATION	SA350 LF2 CL1
5 ASME B16.5 300# WNRF 4" S/120	2EA	V		NO RECORDABLE INDICATION	SA350 LF2 CL1

검사자 <u>K. J. PARK / 박경재</u> 2024.09.26 Examined By Level II Date	<input type="checkbox"/> 주문주/고객 Owner/Customer <input type="checkbox"/> 검토 Reviewed <input type="checkbox"/> 입회 Witnessed
승인자 <u>J. B. NAM / 남정부</u> 2024.09.26 Approved By Level III Date	<input type="checkbox"/> Third Party Inspector <input type="checkbox"/> ANI / AI 공인검사관 <input type="checkbox"/> 검토 Reviewed <input type="checkbox"/> 입회 Witnessed



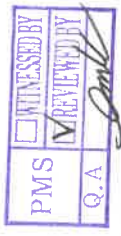
Order No./계약번호 : 01S5126117  
Supplier /주문자 : POSCO INTERNATIONAL CORPORATION  
Customer /고객사 : MYUNGSUNG STEEL

PO No./주문번호 : P4 01S5126117(CS)(2108)  
Commodity /품명 : PLATE NACE MR0103/0175  
Spec & Type : SA516-70 ASME 2019ED NACE MR 0103/0175  
규격

Size/치수	Product No. 제품번호	Quantity 수량 (kg)	Heat No. 제강번호	Position	Tensile Test /인장시험		Hardness /경도 HB	Division	Chemical Composition/화합성분													
					YP (MPa)	TS (%)			EL (%)	C	Si	Mn	P	S	Cr	Ni	B	Cu	Mo	Nb	Ti	V
10x2438x12192	PC96362901-2902	2	SF46385	T	379	546	24	9.5	L	0.1867	0.334	1.330	0.0111	0.0030	0.031	0.016	0	0.017	0.006	0.002	0.0018	0.003
*** Sub Total (060) ***		2	4,666 (kg)	* B/L Date ==> 2021/10/14 CEQ (G) = C + Mn/6 + (Ni + Cu)/15 + Cr + Mo + V/5					P	0.1879	0.331	1.339	0.0110	0.0025	0.030	0.016	0	0.018	0.004	0.001	0.0022	0.002
12x2438x6096	PB60709306	1	SB28165	T	359	540	25	9.0	L	0.1883	0.345	1.350	0.0073	0.0023	0.021	0.013	0	0.021	0.004	0.002	0.0018	0.002
12x2438x6096	PB60709205-9206	2	SB28165	T	365	540	27	9.0	P	0.1884	0.341	1.352	0.0068	0.0024	0.022	0.013	1	0.018	0.006	0.002	0.0015	0.001
*** Sub Total (070) ***		3	4,200 (kg)	* B/L Date ==> 2021/10/14 CEQ (G) = C + Mn/6 + (Ni + Cu)/15 + Cr + Mo + V/5					L	0.1883	0.345	1.350	0.0073	0.0023	0.021	0.013	0	0.021	0.004	0.002	0.0018	0.002
12x2438x12192	PB60709301-9302	2	SB28165	T	359	540	25	9.0	L	0.1883	0.345	1.350	0.0073	0.0023	0.021	0.013	0	0.021	0.004	0.002	0.0018	0.002
*** Sub Total (080) ***		2	5,600 (kg)	* B/L Date ==> 2021/10/14 CEQ (G) = C + Mn/6 + (Ni + Cu)/15 + Cr + Mo + V/5					P	0.1884	0.341	1.352	0.0068	0.0024	0.022	0.013	1	0.018	0.006	0.002	0.0015	0.001

\* Position - T : Top, M : Middle, B : Bottom  
\* Tensile Test Direction : Transversal, Gauge Length : 200 mm (Rectangular),  
YP Method : 0.2 % off-set  
\* A.G.S : Austenite Grain Size.  
\* Division - L : Ladle Analysis, P : Products 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.  
No repair welding was performed to the products. Test Certificate is issued according to ISO 10474/EN 10204 3.1.



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

Surveyor To :

T.C.BAE

Order No./계약번호 : 01S5126117

PO No./주문번호 : P4 01S5126117(CS)(2108)

Supplier /주문자 : POSCO INTERNATIONAL CORPORATION

Commodity /품명 : PLATE NACE MR0103/0175

Customer /고객사 : MYUNGSEUNG STEEL

Spec & Type /규격 : SA516-70 ASME 2019ED NACE MR 0103/0175

Product No. 제품번호	Division	S <sub>Fe</sub> -AI (%)	CEQ (%)	CEQ2 (%)	CEQ (%)	CEQ2 (%)	
PC96362901-2902	L P	0.035 0.036	0.42 0.42	0.41 0.41			
*** Sub Total (060) **			2	4,666 (kg)			* B/L Date ==> 2021/10/14 CEQ (G) = C + Mn/6 + (Ni + Cu)/15 + (Cr + Mo + V)/5      CEQ2 (A) = C + Mn/6
PB60709306	L P	0.033 0.031	0.42 0.42	0.41 0.41			
PB60709205-9206	L P	0.033 0.031	0.42 0.42	0.41 0.41			
*** Sub Total (070) **			3	4,200 (kg)			* B/L Date ==> 2021/10/14 CEQ (G) = C + Mn/6 + (Ni + Cu)/15 + (Cr + Mo + V)/5      CEQ2 (A) = C + Mn/6
PB60709301-9302	L P	0.033 0.031	0.42 0.42	0.41 0.41			
*** Sub Total (090) **			2	5,600 (kg)			* B/L Date ==> 2021/10/14 CEQ (G) = C + Mn/6 + (Ni + Cu)/15 + (Cr + Mo + V)/5      CEQ2 (A) = C + Mn/6

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.  
This material has been made by vacuum degassing and calcium treated process.  
No repair welding was performed to the products. Test Certificate is issued according to ISO 10474/EN 10204 3.1.

29

PMS <input type="checkbox"/> WITNESSED BY	Q.A. <input checked="" type="checkbox"/> REVIEWED BY



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

Surveyor To :

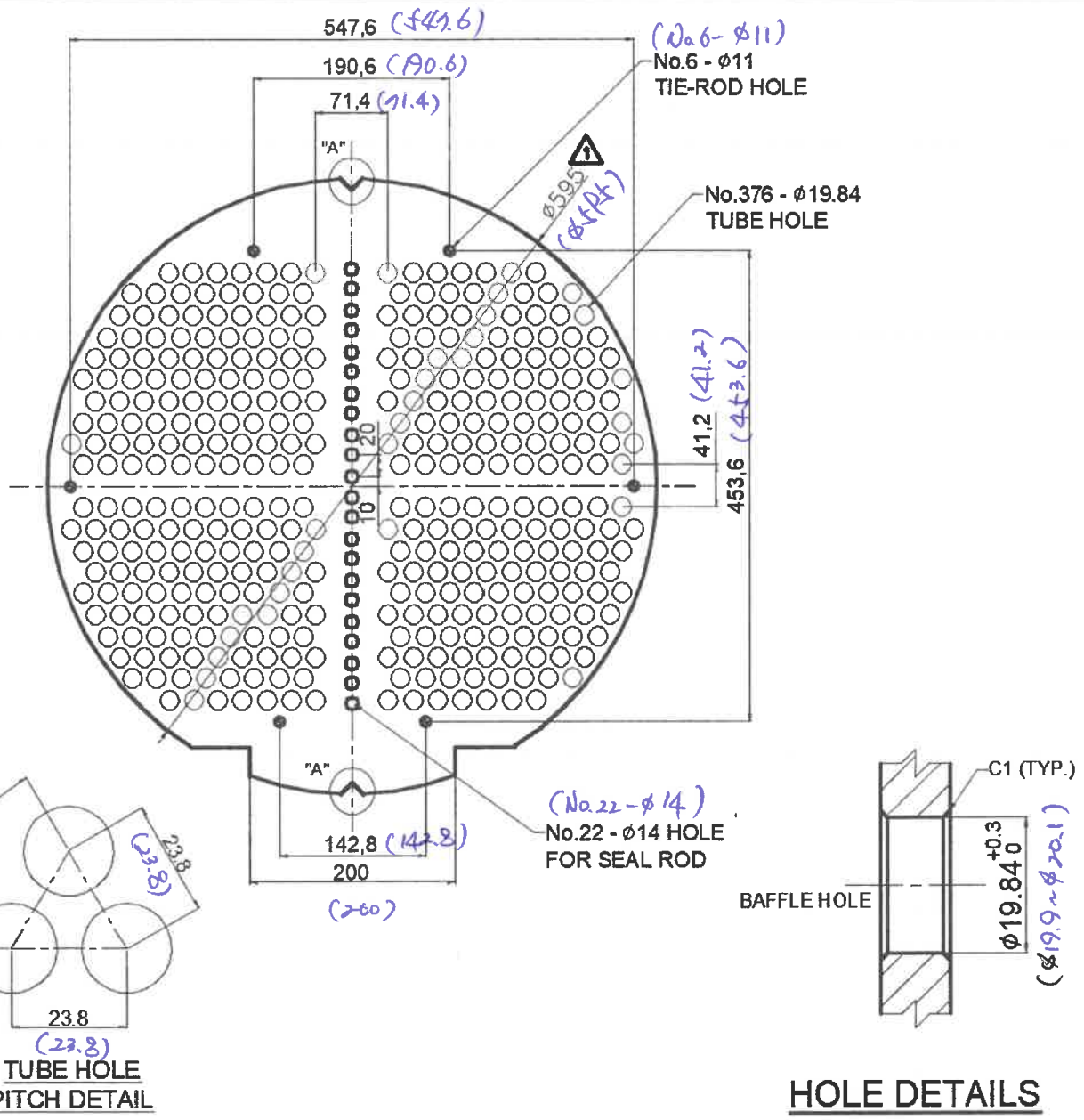
T.C.BAE



# DIMENSION CHECK SHEET

Pioneer Manufacturing & Supply

Item	11) BAFFLE	Date	2024-10-28
Equipment No.	HX-127	Dwg. No.	
Part No.	#3	Material	SA516 Gr.70
Q'ty	8 EA	Size	OD595.2 x 10T
Hole Size	Ø19.84 +0.3 0	Hole Pitch	△ 23.80



Witnessed / Reviewed by

Approved by :

Reviewed by :

Prepared by :

ORIGINAL

검사증명서 MILL TEST CERTIFICATE



주문번호/Order No. : P23B400235
발주번호/PO No. : MYUNGSUNG STEEL
품명/Commodity : STEEL PLATE
제품규격/Specification : ASME SA516-70 MT LTV 2021ED
고객사/Supplier : MYUNGSUNG STEEL
수요자/Customer : MYUNGSUNG STEEL
검사증명서번호/Certificate No. : DP3-2-240129-044-003
발행일자/Date of issue : 2024-01-29

Table with columns: 제품치수 (Dimension), 재품번호 (Product No), 수량 (Quantity), 중량 (Weight), 재강번호 (Heat No), 인장시험 (Tensile Test), 충격시험 (Impact Test), 경도시험 (Hardness), 화학성분 (Chemical Composition), Remarks.

Tensile Test Direction-Transverse-TOP
Impact Test Direction-Longitudinal-TOP
Comp1 = Nb+V
Supply Condition - Normalized
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...

Approval section including 'PMS' and 'Q.A' stamps, a signature, and a QR code. Text: 'PMS', 'Q.A', 'INSPECTED BY', 'REVIEWED BY', 'Surveyor to', 'Chief of Quality Control Team / J.W.Lee'.

ORIGINAL

검사증명서  
MILL TEST CERTIFICATE



주문번호/Order No. : P23B400235  
발주번호/PO No. : MYUNGSUNG STEEL  
품명/Commodity : STEEL PLATE  
제품규격/Specification : ASME SA516-70 MT LTV 2021ED  
고객사/Supplier : MYUNGSUNG STEEL  
수요가/Customer : MYUNGSUNG STEEL  
검사증명서번호/Certificate No. : DP3-2-240129-044-003  
발행일자/Date of issue : 2024-01-29

Table with columns: 제품치수 (Dimension), 제품번호 (Product No), 수량 (Quantity), 중량 (Weight), 화학성분(%) (Chemical Composition), and Remarks. It lists three sub-totals for different specimen types and their chemical compositions.

Test results and notes: Tensile Test Direction-Transverse-TOP, Impact Test Direction-Longitudinal-TOP, etc. Includes a note about the material being fully killed steel.

Witnessed by, Reviewed by, and Surveyor to sections. Includes a signature, a QR code, and a date stamp. The surveyor is identified as J.W. Lee, Chief of Quality Control Team.

Order No./계약번호 : 01S4937689  
Supplier /주문자 : POSCO INTERNATIONAL CORPORATION  
Customer /고객사 : MYJUNGSUNG STEEL

PO No./주문번호 : P4 INN NIPA PJT(2104)(02)  
Commodity /품명 : PLATE NACE MR 0103, 0175  
Spec & Type /규격 : ASME SEC II PART A 19ED SA516-70N MT LTV

Size/치수	Product No./제품번호	Quantity/수량	Weight/중량 (kg)	Heat No./제강번호	Position	Tensile Test /인장시험		Impact Test /충격시험		Hardness /경도	A.G.S	Division	Chemical Composition/화합성분												
						YP (MPa)	TS (MPa)	EL (%)	V Notch -48°C Energy (Joule)				HB	C (%)	Si (%)	Mn (%)	P (%)	S (%)	Cr (%)	Ni (%)	B (ppm)	Cu (%)	Mo (%)	Nb (%)	Ti (%)
12x2438x12192	PC93589502	1	2,800	SF41975	T	360	539	25	1: 209 2: 230 3: 126 A: 188	1: 153.1 2: 152.3 3: 152.2 A: 152.5	9.3	L P	0.1836 0.1869	0.351 0.354	1.336 1.344	0.0076 0.0069	0.0017 0.0020	0.022 0.023	0.012 0.011	3	2	0.015 0.014	0.005 0.005	0.002 0.001	0.0022 0.0017
*** Sub Total (050) *** *** Heat Treatment ===> Normalized : 890°C 21min. *** *** Grade Total ***													CEQ (G) = C + Mn/6 + (Ni + Cu)/15 + (Cr + Mo + V)/5												

WITNESSED BY  
 REVIEWED BY  
 P.M.S. Q.A. *[Signature]*

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. This material has been made by vacuum degassing and calcium treated process. No repair welding was performed to the products. Test Certificate is issued according to ISO 10474/EN 10204 3.1.

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

Surveyor To :

T.C.BAE



Order No./계약번호 : 01S4937689  
 Supplier /주분자 : POSCO INTERNATIONAL CORPORATION  
 Customer /고객사 : MYUNGSUNG STEEL

PO No./주문번호 : P4 INN NIPA PJT(2104)(02)  
 Commodity /품명 : PLATE NACE MR 0103, 0175  
 Spec & Type /규격 : ASME SEC II PART A 19ED SA516-70N MT LTV

Product No. /제품번호	Division	V (%)	Sol-Al (%)	CEQ (%)
PC93589502	L	0.003	0.035	0.41
	P	0.002	0.032	0.42
*** Sub Total (t50) ***			1	2,800 (kg)
*** Grade Total ***			2	4,200 (kg)

\* B/L Date ==> 2021/06/07

CEQ (G) = C + Mn/6 + (Ni + Cu)/15 + (Cr + Mo + V)/5

WITNESSED BY	
Q.A	
REVIEWED BY	
PMS	

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.  
 This material has been made by vacuum degassing and calcium treated process.  
 No repair welding was performed to the products. Test Certificate is issued according to ISO 10474/EN 10204 3.1.

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

Surveyor To :

T.C.BAE

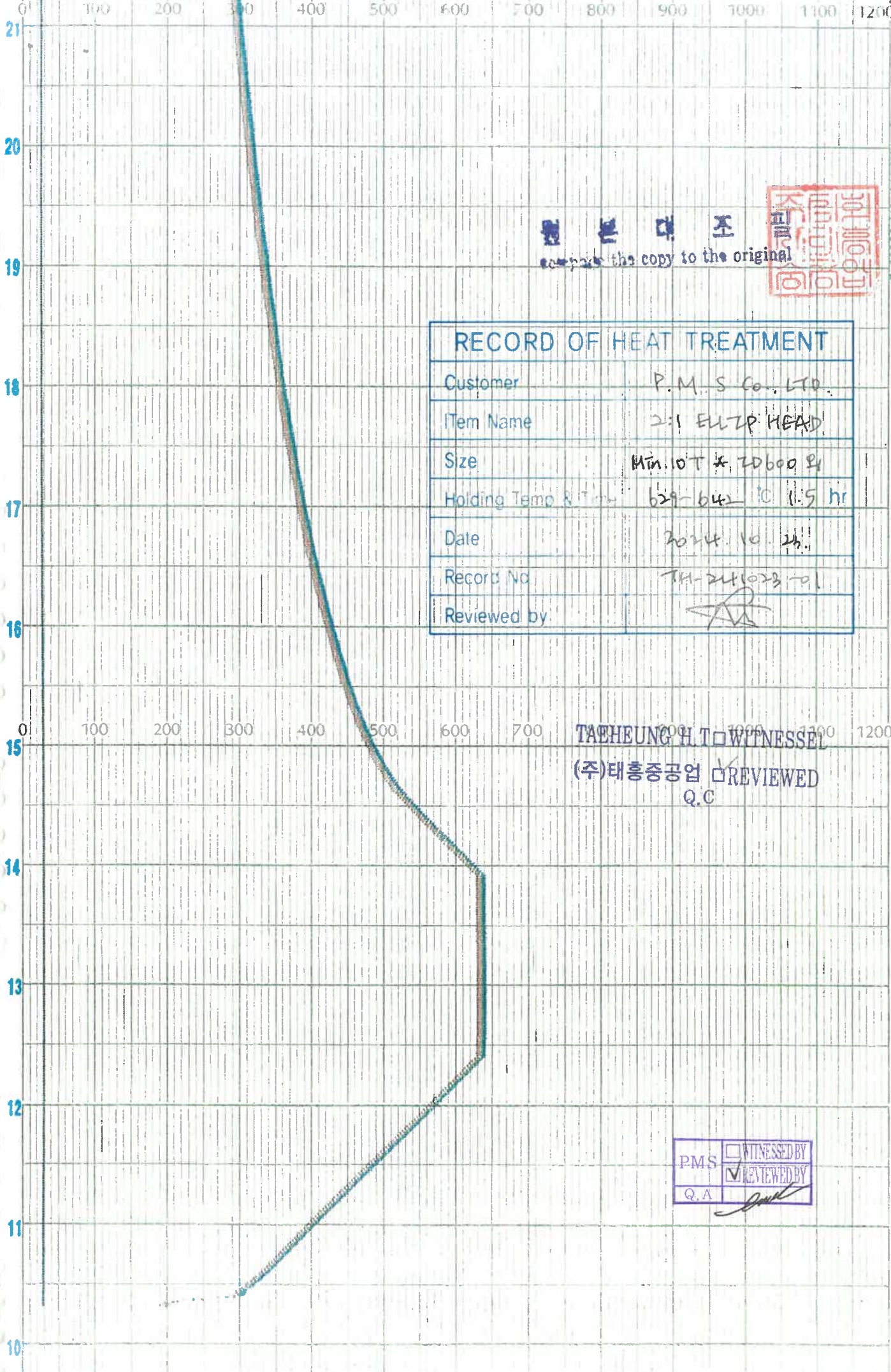


 TAE HEUNG	<b>열 처리</b> <b>HEAT TREATMENT RECORD</b>		H.T DATE	2024. 10. 23.						
			RECORD NO	TH-241023-01						
주문주: CUSTOMER: P.M.S Co., LTD.			열전대종류:	KIND OF THERMO COUPLE : K-TYPE						
공사명: PROJECT NAME: N/A			온도기록계 (TEMP RECORD)							
공사번호: PJT NO: HX-127			교정번호 (CERTIFICATE NO):	UT24T-42538						
부품명: PART NAME: 2:1 ELLIP HEAD			열전대 (THERMO COUPLE)	UT24T-42528 ~ UT24T-42535						
재질: MATERIAL: SA516-70N			가열원:	HEAT SOURCE: Gas						
열처리 종류: TYPE OF HEAT: STRESS RELIEF			기록지 속도:	CHART SPEED: 25mm/hr						
열 처리 조건 (HEAT TREATMENT CONDITION)										
조건 Condition	요구치 온도 Required	실제 작업 온도 Actual	No	ITEM NO	SIZE	Q,T,Y				
① 장 입 온도 Loading Temp.	Max 425 °C	300 °C	1	HX-127	Min.10T*ID600	2EA				
② 가열율 Heating Rate	Max 220 °C/hr	170 °C/hr	2	HX-127	Min.12T*ID925	2EA				
③ 유지 온도 Holding Temp.	625±25 °C	629-642 °C								
④ 유지 시간 Holding Time	Min 60 min	90 min								
⑤ 냉각율 Cooling Rate	Max 280 °C/hr	150 °C/hr								
⑥ 추출 온도 Unloading Temp.	Max 425 °C	290 °C								
⑦ 가열, 냉각, 최대 온도 편차 Max. Allowable Variation in Temp. Heating and cooling.	Max 83 °C	20 °C								
			<table border="1"> <tr> <td>PMS</td> <td><input type="checkbox"/> WITNESSED BY</td> </tr> <tr> <td>Q.A</td> <td><input checked="" type="checkbox"/> REVIEWED BY</td> </tr> </table>				PMS	<input type="checkbox"/> WITNESSED BY	Q.A	<input checked="" type="checkbox"/> REVIEWED BY
PMS	<input type="checkbox"/> WITNESSED BY									
Q.A	<input checked="" type="checkbox"/> REVIEWED BY									
작성자: (Prepared By): H.S.LEE	승인자: (Approved By): C.M.YOU	REMARKS: Temp Recorder, Thermocouple expiry date : 2025. 04. 18.								
TH-F-803-01(Rev.1)					A4(210*297mm)					

원본대조  
compare the copy to the original



RECORD OF HEAT TREATMENT	
Customer	P.M.S Co., LTD.
Item Name	2:1 ELIZO HEAD
Size	Mm. 10T * 70600 P4
Holding Temp & Time	629-642 °C 1.5 hr
Date	2024. 10. 26.
Records No.	TH-241023-01
Reviewed by	



TAEHEUNG H.T. WITNESSEL  
(주)태흥중공업 Q.C REVIEWED

PMS	<input type="checkbox"/> WITNESSED BY
Q.A	<input checked="" type="checkbox"/> REVIEWED BY



# 자 분 탐 상 검 사 보 고 서

## Magnetic Particle Examination Report

Report No.: BK - PMS - U - 241028 - 01  
Page No. : 1 OF 1

Owner/Customer (주문주/고객) Pioneer Manufacturing & Supply Co., Ltd.		Project Name (공사명) PV120		Project No. (공사번호)	
Item Name (제품명) 2:1 ELLIP HEAD		Code (규격) ASTM A275 ASME SA788 S18		Procedure (절차서) N / A	
Item No. (제품번호) SEE BELOW		Drawing No. (도면번호) P24050-E0000-06H Rev.0		Test Time (검사시기) ■ After Forming	
Material (재질) SA516 Gr.70N		Test Block (테스트 블록) ■ Pie indicator (ASTM A 275) ■ Lifting Block (Over 18Kg) (S/No.:MP19706)		Surface Condition (표면상태) ■ As Machined □ As Grinded □ As Welded □	
Yoke Equipment (요크 장비) □ AC(교류) : 10 Lbs. ■ DC(직류) : 40 Lbs. Brand Kyung-Do Model No. MP-A2D Serial No. MP5746 Spacing 3 ~ 5 In Due date 2025. 03. 30.	Magnetization Technique (장비) ■ Yoke (요크법) □ Prod (프로드법) □ Coil (코일법)	Direction of Magnetic Field (자화 종류) ■ Longitudinal (선형자화) □ Circular (원형자화) □ Both (양쪽)	Magnetic Particle (자분, 종류) Brand : GS Chem Co., Ltd. Model No. : MPS-B Batch No. : M240114P □ Dry(건식) ■ Wet(습식) ■ Visible(비형광) □ Fluorescent(형광)	Illuminance Meter (조도계) Brand : TES S/N : 230607627 Model : 1330A Due Date: 2024. 12. 28. Illumination: (조명도) Min. 1100 Lux	Black Light(자외선등) □ With(사용) ■ Without(미사용) Brand : N / A Model : N / A Serial No. : N / A Intensity : N / A Due date : N / A Demagnetization (탈자) □ Yes ■ No
Temp Meter (온도계)	Brand : TES Model : 1300	Model No : 230607462 Due Date : 2024. 12. 27	Test Temp (제품 표면 온도)	■ Ambient □ Elev	

Sketch

\*EXAMINATION AREA  
: Only Knuckle Zone(Out Side & In Side) & Bevel Part

Identification No. 확인번호 (Equi. No./ Part No. / Size)	Q.TY 수량	Accept 합격	Reject 불합격	Interpretation 판정	Remark 비고
1 (HX127) ID600 x 10Min.T x SF50	2EA	V		ACCEPTABLE	
2 (HX127) ID925 x 12Min.T x SF50	2EA	V			
				-BLANK-	

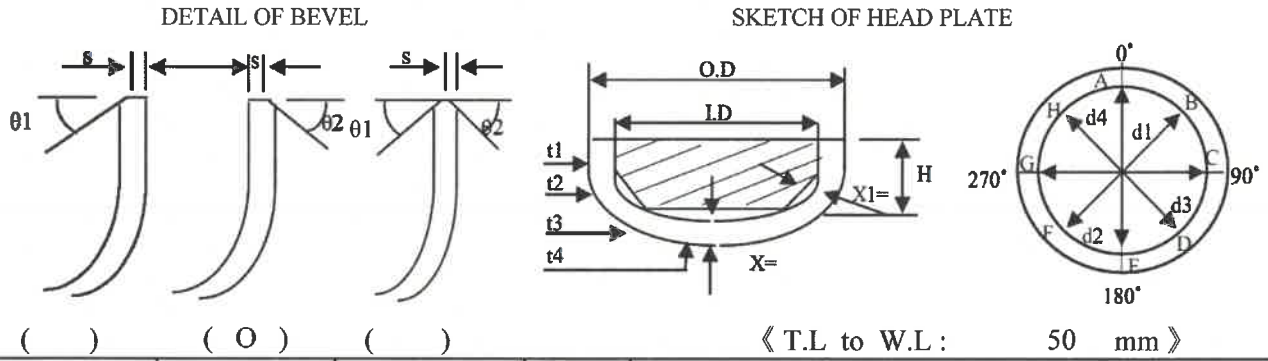
SKETCH ON DOT LINE, IF NECESSARY OR  ATTACHED. 필요시 점선안에 스케치하거나 또는 첨부할것.

Examined by 시 험 자	이 인 섭 I. S. LEE	LEVEL II	Date of Examination 검사일자 Oct. 28. 2024.	Customer QA Manager
			Date of Report 보고서 일자 Oct. 28. 2024.	
Approved by 승 인 자	김 두 진 D. J. KIM	LEVEL III	□ Witnessed by 입 회 자	
			□ Reviewed by 검 토 자	

# INSPECTION REPORT FOR HEAD PLATE

CUSTOMER	PMS CO., LTD.			PROJECT NAME	HX-127
ITEM NAME	HEAD	P/O No.	PMS-24-050	CODE	ASME Sect. VIII, Div. 1(2023Ed.)
FORMING METHOD	COLD	HEAD TYPE	2:1 ELLIP	INSPECTION DATE	18-Oct-24
MATERIAL SPEC.	SA516 Gr.70N	QUANTITY	2EA	DWG NO.	

SKETCH Unit : mm



Description	Design Dimension	Tolerance	Mark	Actual Dimension							
				HEAD				HEAD			
Inside Diameter (Roundness)	925	Max-Min= 1% of Nominal I.D	I.D	d1	d2	d3	d4	d1	d2	d3	d4
Circumference	2906		$\pi$ I.D	2907				2905			
Height	281	0~+1.25% X I.D	H	287				288			
Thickness	14	Min. 12		A	C	E	G	A	C	E	G
			t1	14.8	14.6	14.2	14.9	14.6	14.7	14.4	14.6
			t2	13.9	13.8	13.6	13.8	13.9	13.9	13.7	13.9
			t3	13.2	13.2	13.0	13.2	13.2	13.2	13.2	13.2
Shape deviation	R = 837	+1.25% of ID ~ -0.625% of ID		X		X1		X		X1	
	r = 160	Small Radius > r	A.E	GOOD		GOOD		GOOD		GOOD	
Bevel Angle	S= 2	$\pm 1$	S	1				1			
	$\theta 1 =$	-	$\theta 1$	N/A				N/A			
	$\theta 2 = 25^\circ$	$\pm 2.5^\circ$	$\theta 2$	GOOD				GOOD			

Plate No.

Judgment

ACCEPTABLE

ACCEPTABLE

We hereby certify that above heads made by cold forming meet all requirement of UG79(d) of ASME Sect.VIII Div.1 and heat treatment is  not performed.  performed

WITNESSED BY



APPROVED BY

S. J. PARK



INSPECTED BY

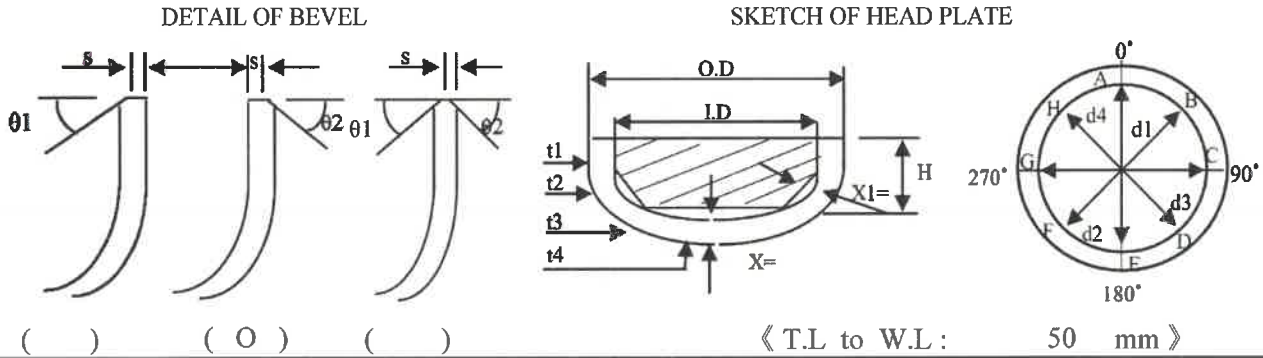
Y. S. PARK



# INSPECTION REPORT FOR HEAD PLATE

CUSTOMER	PMS CO., LTD.			PROJECT NAME	HX-127
ITEM NAME	HEAD	P/O No.	PMS-24-050	CODE	ASME Sect. VIII, Div. 1(2023Ed.)
FORMING METHOD	COLD	HEAD TYPE	2:1 ELLIP	INSPECTION DATE	18-Oct-24
MATERIAL SPEC.	SA516 Gr.70N	QUANTITY	2EA	DWG NO.	

SKETCH Unit : mm



Description	Design Dimension	Tolerance	Mark	Actual Dimension							
				HEAD				HEAD			
Inside Diameter (Roundness)	600	Max-Min= 1% of Nominal I.D	I.D	d1	d2	d3	d4	d1	d2	d3	d4
Circumference	1885		$\pi$ I.D	1884				1885			
Height	200	0~+1.25% X I.D	H	205				208			
Thickness	12	Min. 10		A	C	E	G	A	C	E	G
			t1	14.3	14.1	14.2	14.6	14.8	14.9	14.3	14.8
			t2	12.6	12.8	12.8	12.8	13.0	12.9	12.8	12.9
			t3	12.3	12.1	12.3	12.2	12.3	12.4	12.2	12.3
Shape deviation	R = 543	+1.25% of ID ~ -0.625% of ID		X		X1		X		X1	
	r = 104	Small Radius > r	A.E	GOOD		GOOD		GOOD		GOOD	
Bevel Angle	S= 2	$\pm 1$	S	1				1			
	$\theta 1 =$	-	$\theta 1$	N/A				N/A			
	$\theta 2 = 25^\circ$	$\pm 2.5^\circ$	$\theta 2$	GOOD				GOOD			

Plate No.	
Judgment	ACCEPTABLE      ACCEPTABLE

We hereby certify that above heads made by cold forming meet all requirement of UG79(d) of ASME Sect.VIII Div.1 and heat treatment is  not performed.  performed

WITNESSED BY

PMS  WITNESSED BY

Q.A  REVIEWED BY

*Q.A*

APPROVED BY S. J. PARK

INSPECTED BY Y. S. PARK