

Toyo Engineering India Pvt. Ltd.



**DIESEL HYDRO TREATING UNIT (DHDT) & HYDROGEN GENERATION UNIT (HGU) AT
HRRL BARMER**

OWNER / CLIENT	: HPCL Rajasthan Refinery Limited (HRRL)
PMC / JOB NO	: Engineers India Limited (EIL)/B224
PROJECT TITLE	: Diesel Hydro Treating Unit (DHDT) & Hydrogen Generation Unit (HGU)
TEIL JOB NO./NAME	: 6403/HBDH
VENDOR NAME	: SANGHVI FOGING & ENGINEERING LIMITED
PURCHASE ORDER NO.	: P/6403/31331/IAXHC201A & P/6403/31332/AXHC201A-1
EQUIPMENT NAME / NO	: SS FLANGES (ASTM A182-H2-NACE-IBR)
TEIPL DOCUMENT NO	: HBDH-VD-000-PIP-ITP-I-AXHC201A-1-001
VENDOR DOCUMENT NO.	: SFEL/QAP/TOYO/005 REV. 02
DOCUMENT TITLE	: Quality Assurance Plan

TEIL JOB NO. – 6403		PROJECT : - HBDH
<input checked="" type="checkbox"/>	Approved	Proceed
B	Approved with Comments & Resubmit	Proceed with changes as noted & resubmit
C	Not Approved & resubmit	Do not proceed. Changes as Noted and Resubmit
D	Not for Approval	Information noted
23.06.2020	<i>[Signature]</i>	<i>[Signature]</i>
Date	C/AC	LAE
		TM/DH

<input checked="" type="checkbox"/> AP	REVIEWED & APPROVED
<input type="radio"/> AC	APPROVED WITH COMMENTS (RE-SUBMIT)
<input type="checkbox"/> NA	NOT APPROVED(RESUBMIT)
<input type="checkbox"/> RF	RETAINED FOR INFORMATION

AT
23.06.2020
[Signature]
AJAY THORAT

[Signature]

TUV (INDIA) INDIA PVT LTD

Note: Review by purchaser whether or not resulting in comments shall not relieve supplier / contractor of any obligations or requirements is under the purchaser order / contract and it shall not be construed as on authorization of or consent to only deviation from the purchase order / contract.

REV.	DATE	DESCRIPTION	PREPARED	CHECKED	APPROVED
02	17/06/2020	QAP	PRAKASH NAIR QA/QC ENGG.	KISHOR GUPTA DGM	



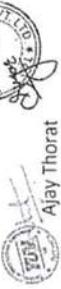
INSPECTION CAT.-C

ENO 9107165 & 9107163

QUALITY ASSURANCE PLAN FOR FLANGE/FORGING ASTM A182 F304/304L (H2, NACE) & F316(H2)/MBR

PRODUCT/ PROCESS	CHARACTERISTIC	QUANTUM OF CHECK	REFERENCE TO DOC	ACCEPTANCE CRITERIA	FORM OF RECORD	SCOPE OF INSP
RAW MATERIAL INSPECTION					TPIA	TPIA
BARS / BILLETS / INGOTS	SIZE/HEAT NO /CHEMICAL CONTENT AND VISUAL	100% PER HEAT	MATERIAL SPEC AST-A 182	AS PER CODE ASTM A182 *	MTC FILE*	H R
INPROCESS INSPECTION/ CONTROL						
FORGED PRODUCT	TEMP.	1st & LAST PIECE /HEAT	MFRS PROCEDURE	AS PER CODE	REPORT	H
HEAT TREATMENT PROCEDURE	Procedure to comply with applicable PR/SPEC/CODE	100%	PER PROCEDURE specification/Applicable code	PR/PO specification/Applicable code	Inhouse Documents	H R
NDT PROCEDURE						
HEAT TREATMENT	Solution annealing/ Stabilizing only for F321 & F347 (REFER NOTE-5)	TEMPERATURE/TIME - GRAPH	100%	MFRS PROCEDURE	AS PER CODE /ASME SEC II HEAT TREATMENT RECORD REPORT	H R
TEST PIECE IDENTIFICATION	SIZE/HEAT NO/HT BATCH (Test coupon id n For Testing Witness)	PER HEAT/PER HEAT TREATMENT LOT	MFRS PROCEDURE	AS PER CODE ASTM A182	REPORT	H H
CHEMICAL TEST	PRODUCT ANALYSIS	PER HEAT/PER HEAT TREATMENT LOT	MFRS PROCEDURE	AS PER ASTM A182 AS PER PO	LAB REPORT	H R
IGC TEST (REFER NOTE-6)	IGC TEST	PER HEAT/PER HEAT TREATMENT LOT	A262 OR ASME	AS PER ASTM A262 PRAE	LAB REPORT	H W
PHYSICAL TEST	TENSILE TEST	PER HEAT/PER HEAT TREATMENT LOT	MATERIAL SEC	AS PER ASTM A182 AS PER PO	LAB REPORT	H W
MACHINING	SIZE / DIMENSIONS	FIRST PIECE APPROVAL	DRAWINGS / STANDARDS	DRAWINGS/ STANDARDS (INPROCESS INSP REPORT)		H
FINAL INSPECTION						
NON DESTRUCTIVE TEST (REFER NOTE-7)	DP TEST (ON BEVEL END) PMI (PMI OK STAMP MUST REQ. ON FLANGES)	100%	MFRS PROCEDURE	MATERIAL SPECIFICATION	INSPECTION REPORT	H RW (100% REPORT REVIEW)
		100%	MFRS PROCEDURE (EIL Spec- 6-SI-a@0 E-Lv-3)	ITEM-SPECIFICATION(EIL Spec- 6-SI-a@0 E-Lv-3)	INSPECTION REPORT	H RW (100% REPORT REVIEW)
FINAL INSPECTION	SIZE/DIMENSIONAL CHECK, FLANGE FINISH, VISUAL MARKING AND STAMPING, HARDNESS OF NACE FLANGES AND DIMENSION OF BUTT WELD ENDS	100%	DRAWING /SPE-CODE STANDARDS SIZE, CLASS, MTRL/LT NO (ASME B16.5 & B16.47 SR-3)	DRAWING /AS PER CODE STANDARDS SIZE, CLASS, MTRL/LT NO (ASME B16.5 & B16.47 SR-3)	INSPECTION REPORT/DIMENSION REPORT	H 10% W & 100% visual Inspection
CERTIFICATION	AS PER SPEC/PRN/P0	100%	MANUFACTURE TEST CERT EN 10234-3.1	CODE/ MANUFACTURER TEST CERT EN 10234-3.1	MTC/ RELEASE NOTE	H H
COLOR CODING	AS PER SPEC/PO	100% Visual Check	AS PER DOC. NC-H-BDH-ED-P/SP-5-SPC-000-CD-1 Rev. 02	AS PER DOC. NC-H-BDH-ED-P/SP-5-SPC-000-CD-1 Rev. 02	INSPECTION REPORT	H 10% W
END PROTECTION & Rust preventive application	As Per Par.4 of Appendix 2 & as per Packing Specification & Pre Shipment Inspection Report	100%	MFRS PROCEDURE	SPECIFICATION	PRE SHIPMENT INSPECTION REPORT OR COMPLIANCE LETTER	H W
PICKLING & PASSIVATION	VISUAL	100% Visual Check	MFRS PROCEDURE		PICKING & PASSIVATION REPORT	H 10% W
DISPATCH	PACKING	100%	D.C	D.C	Release note	H R
(II-FOLD POINT) (IR-REVIEW POINT)		{ V. VERIFICATION }	{ W. WITNESS POINT }			
HARD PUNCH MARKING : LOGO, MATERIAL SPECIFICATION , NOMINAL SIZE - RATING , DIMENSION STANDARD , HEAT NO & ITEM CODE.						
END FINISH OF THE FLANGES : SOCKET WELDING END (SW) SHALL BE IN ACCORDANCE WITH ASME B16.5 & B16.47 SR-B (OR ABOVE 24 FLANGE (PO SR NO.-47, 48))						
following specification shall be complied & reference to be mentioned on QAP						

Ajay Thorat



SANGHVI FORGING & ENGINEERING LTD.

FINAL INSPECTION

OFFER NO : 5954

CLT NAME : TOYO ENGINEERING INDIA PRIVATE LTD.

PO NO : P/6403/34366/AXHC201B-3

DATE: 14/06/2021

PO DATE: 11/01/2021

SO NO	PO SR	HEAT NO	HT BATCH NO	ITEM DESCRIPTION	ITEM CODE	MATERIAL STD	DIMENSION STD	PO QTY	OFFER QTY	BALANCE QTY
9107395	5	SF 6216A	1F 28022021	1 NPS X CL 150 WNRF SA05	16887430	ASTM A182 F304L (ED-2018)	ASME B16.5 (ED-2017)	11	2	NIL
9107395	6	SF 6273A	3F 03052021	1 1/2 NPS X CL 150 WNRF SA05	16887500	ASTM A182 F304L (ED-2018)	ASME B16.5 (ED-2017)	17	8	9
9107395	23	SF 6273A	3F 03052021	18 NPS X CL 600 WNRF SA05 (H2)	11913900922	ASTM A182 F304L (ED-2018)	ASME B16.5 (ED-2017)	2	2	NIL
9107395	26	SF 6216A	1F 28022021	1/2 NPS X CL 300 WNRF SA05	17077270	ASTM A182 F304 (ED-2018)	ASME B16.5 (ED-2017)	12	8	4
9107395	31	SF 6216A	1F 28022021	1 NPS X CL 300 SWRF SA05 (NACE)	11728803420	ASTM A182 F304L (ED-2018)	ASME B16.5 (ED-2017)	13	13	NIL
TOTAL								33 NOS		

FOR CLIENT/THIRD PARTY

- Vis 100% checked - Minor issue detected observed.
- Dim " 10% whited - found to meet Reg.
- DP 10% whited - found to meet Reg
- Nodules 10% whited - found to meet Reg.
- Colloc 0 days, End part from 9 MTC Board.
- Imported items stamped doobloq & boluva & Sifus &  near my making.





SANGHVI
FORGING & ENGINEERING LTD.

Mfg. of : Forged Flanges & CNC Machined Forged Components

E-mail : contact@sanghviforge.com Website : www.sanghviforge.com

H.O. & WORKS : 244 / 6 - 7, G.I.D.C. IND. ESTATE,

Waghodia - 391 760. Dist. Baroda, India.

Ph. : +91-2668-263020/262201 Fax : +91-2668-263411

INSPECTION CERTIFICATE
(ACCORDING TO EN 10204 3.2)

TC No. : 16384

DATE : 15/06/2021

CLIENT : TOYO ENGINEERING PRIVATE LIMITED

ORDER No. P/6403/34366/AXHC201B-3

DATE 11/01/2021

S.O.No. 9107395

HEAT NO.	SR. NO.	QTY	ITEM DESCRIPTION	ITEM CODE	MATERIAL DESCRIPTION	DIMEN. STANDARD
SF 6216A	5	2	1 NPS X CL 150 WNRF S40S	I6887430	ASTM A182 F304L (ED-2018)	ASME B16.5 (ED-2017)
SF 6273A	6	8	1 1/2 NPS X CL 150 WNRF S40S	I6887500	ASTM A182 F304L (ED-2018)	ASME B16.5 (ED-2017)
SF 6273A	23	2	18 NPS X CL 600 WNRF S40S (H2)	I1913900922	ASTM A182 F304L (ED-2018)	ASME B16.5 (ED-2017)
SF 6216A	26	8	1/2 NPS X CL 300 WNRF S80S	I7077270	ASTM A182 F304 (ED-2018)	ASME B16.5 (ED-2017)
SF 6216A	31	13	1 NPS X CL 300 SWRF S40S (NACE)	I1728803420	ASTM A182 F304L (ED-2018)	ASME B16.5 (ED-2017)

CHEMICAL ANALYSIS

HEAT NO.	C %	Mn %	Si %	P %	S %	Cr %	Ni %	Mo %	N %	Al %	Ti %	Cu %	V %	B %	CE %
SF 6273A	0.025	1.550	0.350	0.044	0.011	18.340	8.050	-	0.0800	-	-	-	-	-	-
SF 6216A	0.026	1.542	0.379	0.039	0.013	18.216	8.005	-	0.0626	-	-	-	-	-	-

MECHANICAL TESTS

HEAT NO.	Yield Point (MPA)		Tensile Strength (MPA)	Elongation		Reduction Area %	Hardness BHN	Impact Test(Joules)				
	0.2%	1%		G.L.mm	%			C	I	II	III	Avg.
SF 6273A	305.0	-	537.0	50.00	55.08	75.690	140-149	-	-	-	-	-
SF 6216A	346.0	-	604.0	50.00	56.80	72.926	143-145	-	-	-	-	-

HEAT NO. (HT BATCH NO)	HEAT TREATMENTS	REMARKS
SF 6273A (3F 03052021)	SOLUTION ANNEALING AT 1060 DEG C, SOAKING TIME 2 HRS AND QUENCH IN WATER TEMP BELOW 260 DEG C.	1. WE CERTIFY THAT THE ITEMS CONFIRM STRICTLY TO DIMENSION & MATERIAL SPECIFICATION OF THE ORDER. 2. VISUAL INSPECTION & DIMENSIONAL CHECKED FOUND ACCEPTABLE. 3. GASKET FACE FINISHES 125-250 AARH. 4. IGC TEST CARRIED OUT AS PER ASTM A262 PRA-E & FOUND SATISFACTORY RESULTS. 5. ALL S.S ITEMS ARE P.M.I CHECKED & FOUND SATISFACTORY RESULTS. 6. ALL ITEMS HARDNESS CHECKED & FOUND SATISFACTORY RESULTS. 7. PICKLING PASSIVATION CARRIED OUT AS PER ASTM A380 & FOUND SATISFACTORY RESULTS. 8. PT TEST CARRIED OUT ON BEVEL END AS PER SE-165 OF ASME SEC V FOUND ACCEPTABLE AS PER APPENDIX 8 OF ASME SEC VIII DIV 1 [Edition: 2017]. 9. ABOVE MATERIAL ARE AS PER ASME SEC II PART A ED-2017. 10. THK ABOVE 50 MM FLANGES ULTRASONICALLY TESTED AS PER SA 388 & ACCEPTANCE AS PER PARA 3.3.4.OF ASME SECTION VIII DIV 2 (ED-2015).
SF 6216A (1F 28022021)	SOLUTION ANNEALING AT 1060 DEG C, SOAKING TIME 1.5 HRS AND QUENCH IN WATER TEMP BELOW 260 DEG C.	



SIZE - RATING - TYPE
SPECIFICATION/GRADE
DIM STD - HEAT NO, MATERIAL CODE



QUALITY CONTROL INSPECTOR



Ref: SFEL/9107395/003 Date: 15/06/2021

To,

TOYO ENGINEERING INDIA PVT LTD.

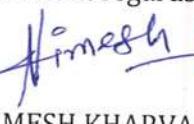
SUB.: COMPLIANCE CERTIFICATE

Ref. PO. NO. P/6403/34366/AXHC201B-3 Dt. 11.01.2020

Dear Sir,

With reference to Offer list No. 5955 DT. 15/06/2021 Flanges were rust preventive color coding was done as per your spec HBDH-ED-PIP-SPC-000-0011_Rev.3 and found satisfactory and all Flanges were protected with raised face with Plastic caps/Bubble sheet and also bevel end protection with plastic caps/Bubble sheet and if any damages found during transportation we shall supply free of cost of the damaged QTY.

Thanks & regards


NIMESH KHARVA
(QA/QC Engineer)

For

SANGHVI FORGING AND ENGINEERING LTD.



SANGHVI FORGING & ENGINEERING LTD.

COLOR CODING REFOFT

OFFER NO : 5955

PO NO : P/6403/34366/AXHC201B-3

DATE: 15/06/2021

SO NO	PO SR	HEAT NO	HT BATCH NO	ITEM DESCRIPTION	ITEM CODE	MATERIAL STD	dimension STD	PO QTY	offer QTY	COLOR CODE
9107395	5	SF 6216A	1F 28022021	1 NPS X CL 150 WNRF S405	I6387430	ASTM F-182 F304L (ED-2018)	ASME B16.5 (ED-2017)	11	2	SKY BLUE
9107395	6	SF 6273A	3F 03052021	1 1/2 NPS X CL 150 WNRF S405	I6887500	ASTM F-182 F304L (ED-2018)	ASME B16.5 (ED-2015)	17	8	SKY BLUE
9107395	23	SF 6273A	3F 03052021	1 8 NPS X CL 600 WNRF S405 (H2)	I913900922	ASTM F-182 F304L (ED-2018)	ASME B16.5 (ED-2015)	2	2	SKY BLUE
9107395	26	SF 6216A	1F 28022021	1 1/2 NPS X CL 300 WNRF S805	I7077270	ASTM F-182 F304 (ED-2018)	ASME B16.5 (ED-2017)	12	8	SKY BLUE+WHITE
9107395	31	SF 6216A	1F 28022021	1 NPS X CL 300 SWRF S405 (MACE)	I1728803420	ASTM F-182 F304L (ED-2018)	ASME B16.5 (ED-2017)	13	13	NONE
										SKY BLUE+ CANERY YELLOW

PO DATE: 11/01/2021

CLT NAME : TOYO ENGINEERING INDIA PRIVATE LTD.

DATE: 15/06/2021



PO DATE: 11/01/2021



FOR CLIENT/ THIRD PARTY



Sanghvi Forging & Engineering Ltd.
 244/6-7 G.I.D.C Ind. Estate Waghdia - 391 760 05 Dist.: Baroda, Gujarat, India
 Ph.: +91-2668 - 263020 / 262201
 Fax : +91- 2668 - 263411
 E-mail : qa@sanghviforge.com
 Website : www.sanghviforge.com

LIQUID PENETRANT EXAMINATION REPORT

REPORT NO : SFEL/DP/2020-21/9107395/001

CUSTOMER	TOYO ENGINEERING INDIA PVT LTD.	SO NO.	9107395
PROCEDURE NO.	SF/PT/01 REV. 2	APPLICABLE CODES	SE165 ASME Sec. VIII Div. 1; Appendix 8
PO NO.	P/6403/34366/AXHC201B-3	AREA TESTED	BEVEL END

EXAMINATION CONDITION

METHOD	VISIBLE COLOR CONTRAST SOLVENT REMOVAL		EXAMINATION DATE & TIME	14.06.2021	
SURFACE CONDITION	MACHINED		TEMP. OF TEST SURFACE	36 DEG. CENT.	
PENETRANT MATERIAL USED	MAKE	BRAND	BATCH NO & MAN. DATE		
PRE-CLEANER	MAGNAFLUX	SKC - I	20B02 10/02/2020	DRYING TIME AFTER PRE CLEANING	05 MIN.
PENETRANT	MAGNAFLUX	SKL - SP 1	19M15 19/12/2019	PENETRATION DWELL TIME	10 MIN.
EXCESS PENETRANT REMOVER	MAGNAFLUX	SKC - I	20B02 10/02/2020	DRYING TIME AFTER REMOVAL OF EXCESS PENETRANT	02 MIN.
DEVELOPER	MAGNAFLUX	SKD - S2	19M10 23/12/2019	DEVELOPING TIME	10 MIN.

NOTE : MATERIALS CAN BE USED 5 YEARS

APPLICATION METHOD	SPRAYING
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RECORDS / RESULTS

SR. NO	ITEM IDENTIFICATION	LOT NO	QTY	MATERIAL GRADE	SR NO OF SO.	OBSERVATION
1	1 NPS X CL 150 WNRF S40S	SF 6216A	2	ASTM A182 F304L	5	NO RELEVANT INDICATIONS OBSERVED
2	1 1/2 NPS X CL 150 WNRF S40S	SF 6273A	8	ASTM A182 F304L	6	
3	18 NPS X CL 600 WNRF S40S (H2)	SF 6273A	2	ASTM A182 F304L	23	
4	1/2 NPS X CL 300 WNRF S80S	SF 6216A	8	ASTM A182 F304	26	
	LPT PERFORMED BY			QA DEPARTMENT		WITNESSED BY
	(ASNT LEVEL I)			Waghdia	(ASNT LEVEL II)	
DATE	14.06.2021			14.06.2021		





Sanghvi Forging & Engineering Ltd.

244/6-7 G.I.D.C Ind. Estate Waghdia - 391 760 Dist.: Baroda, Gujarat, India
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 E-mail : qc@sanghviforge.com Website : www.sanghviforge.com

Hardness Test Reports

Page 1 of 1

Report No.: 2020-21/SFEL/HARDNESS/9107395/001

Date: 14.06.2021

To,
 Sanghvi Forging & Engineering Ltd.
 244/6-7 G.I.D.C. Ind. Estate,
 Waghdia - 391 760 , Baroda

TEST : Hardness Test.

Make/ Model No. : Insize

Serial No.: E20020292000

CALIBRATION DUE DATE : 02.07.2021

Test performed at.: Sanghvi Forging & Engineering Ltd. -- Testing Division (Lab)

Nature of Sample	: Final Machining	PO NO-P/6403/34366/AXHC201B-3
SO NO.	: 9107395	
CLIENT	: TOYO ENGINEERING	

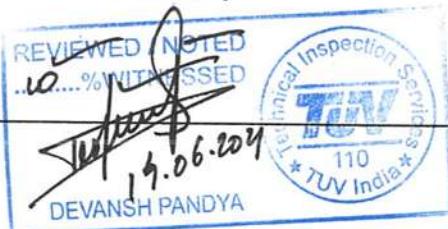
SR NO.	PO SR NO.	LOT NO. NO.	ITEM DESCRIPTION	ITEM CODE	MATERIAL STD	QTY	Required (BHN)	Result (BHN)
	5	SF 6216A	1 NPS X CL 600 SWRF S40S (NACE)	I6887430	ASTM A182 F304L	2	237 MAX	158 - 160
2	6	SF 6273A	6 NPS X CL 300 WNRF S10S (H2)	I6887500	ASTM A182 F304L	8		160 - 161
3	23	SF 6273A	14 NPS X CL 600 WNRF S80S (H2)	I1913900922	ASTM A182 F304L	2		155 - 158
4	26	SF 6216A	18 NPS X CL 600 WNRF S40S (H2)	I7077270	ASTM A182 F304	8		162 - 163
4	31	SF 6216A	20 NPS X CL 600 WNRF THK= 17 MM (H2)	I1728803420	ASTM A182 F304L	13		164 - 165

REMARKS: Results confirms to ASTM A182 F304/304L & Found Satisfactory

Checked by

Witnessed By

Authorized Signatory





Sanghvi Forging & Engineering Ltd.
244/6-7 G.I.D.C Ind. Estate Waghodia - 391 760 Dist.: Baroda, Gujarat, India
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Website : www.sanghviforge.com

PICKLING & PASSIVATION PROCESS CERTIFICATE

JOB DETAILS: -

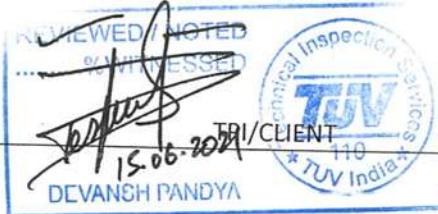
CUSTOMER	TOYO ENGINEERING INDIA PVT LTD.		
PO NO	P/6403/34366/AXHC201B-3	PO DATE	11/01/2021
Report No.	2020-21/SFEL/PICK/003	Date	15.06.2021
Material Specification	ASTM A182 F304-F304L & F321	SO NO	9107395
APPLICABLE CODES & STD.	ASTM A 380	PROCEDURE NO	SFEL/PICK/01

TO WHOMSOEVER IT MAY CONCERN

This is to certify that the following items are duly PICKLED and PASSIVATED as per ASTM A 380.

Sr. No	MATERIAL DESCRIPTION	MATERIAL	LOT NO	PO SR	QTY
1	1 NPS X CL 150 WNRF S40S	ASTM A182 F304L (ED-2018)	SF 6216A	5	2
2	1 1/2 NPS X CL 150 WNRF S40S	ASTM A182 F304L (ED-2018)	SF 6273A	6	8
3	18 NPS X CL 600 WNRF S40S (H2)	ASTM A182 F304L (ED-2018)	SF 6273A	23	2
4	1/2 NPS X CL 300 WNRF S80S	ASTM A182 F304 (ED-2018)	SF 6216A	26	8
5	1 NPS X CL 300 SWRF S40S (NACE)	ASTM A182 F304L (ED-2018)	SF 6216A	31	13

Himethi
Waghodia
QA/QC ENGINEER



ULTRASONIC TEST REPORT

SANGHVI FORGING & ENGINEERING LTD.

244/6-7 G.I.D.C IND. ESTATE WAGHODIA - 391 760 DIST.: BARODA, GUJARAT, INDIA

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E-MAIL : gclab@sanghviforge.com

WEBSITE : www.sanghviforge.com

REPORT FORMAT: F:QC/10/R02

JOB DETAIL:-

CUSTOMER	TOYO ENGINEERING INDIA PVT LTD		
REPORT NO.	2020-21/SFEL/UT/223	DATE	13.05.2021
MATERIAL SPECIFICATION	ASTM A182 F304L	SO NO	9107395
STAGE OF EXAM	PROOF MACHINING	PO NO	P/6403/34366/AXHC201B-3
JOB DETAIL	FLANGES	SCANNING SURFACE	ALL ACCESSIBLE AREA

U.T. EQUIPMENTS DETAIL:-

MAKE	MODSONIC MAKE	SERIAL NO.	E3953-0213
MODEL	EINSTEIN-II DGS	CALIBRATION DUE DATE.	23.09.2021

PROBE & CALIBRATION:-

SR. NO.	PROBE	FREQUENCY	TYPE	SIZE	REF. GAIN	CALIBRATION RANGE	TRANSFER CORRECTION
1	NORMAL	2 MHZ	0°	24 MM	65 Db	300 MM	-
2	NORMAL	2 MHZ	0°	24 MM	68 Db	350 MM	-
2	NORMAL	2 MHZ	0°	24 MM	68 Db	350 MM	-

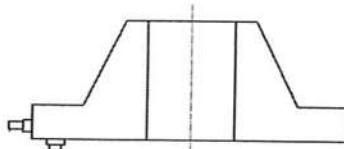
BASIC CALIBRATION BLOCK: - IIW-V1 BLOCK

EXAMINATION DETAIL:-

EXAMINATION PROCEDURE	SF/UTE/01 RFV. 4	METHOD & ACCEPTABLE STANDARDS	ASME SEC 8/DIV 2/PARA 3.3.4
METHOD OF TEST	PULSE ECHO CONTACT	SCANNING GAIN	REFERENCE DB + 6 DB
SCANNING SPEED	6 INCH / SECOND	SCANNING COVERAGE	15 % OF EACH PASS
COUPLANT USED	OIL + WATER	POST CLEANING	BY LINT FREE COTTON
REFERENCE LEVEL	FBW SET TO 80% OF FSH	RECORDING LEVEL	INDICATION & 100% BWL

RECORDS / RESULTS

SR NO.	ITEM DESCRIPTION	QTY	MATERIAL	OBSERVATION	
22	14 NPS X CL 600 WNRF S805 (H2)	4	ASTM A182 F304L	No recordable indication was observed at accessible area.	
23	18 NPS X CL 600 WNRF S405 (H2)	2	ASTM A182 F304L		
24	20 NPS X CL 600 WNRF THK= 17 MM (H2)	1	ASTM A182 F304L		
TESTED BY (LEVEL - I / II)	Mr. Ketan Patel	Q.A. DEPARTMENT (LEVEL - I / II)	Mr. Ketan Patel	INSPECTION AUTHORITY	
DATE :-	13.05.2021	DATE :-	13.05.2021	DATE :-	13.05.2021





AADHYA ENGINEERING SERVICES

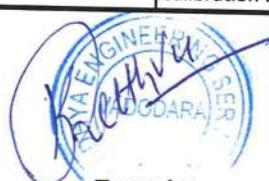
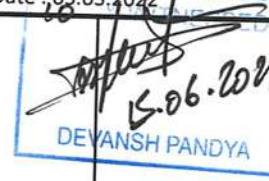
Works : 346/B/2, Beside Lalji Mulji Transport, GIDC, Makarpura, Vadodara-390010.

Email : testing.aes2019@gmail.com / aadhyae.engineers@gmail.com

Contact : 9537530900 / 7567158821 / 8000296579



PMI TEST REPORT

Test Report No:		AES/PMI/ 01		Date of Test :	14/05/2021	Page No.:	01
Sr. No.	Description	Material Spec.	Location/ Qty	Alloy Content (%)			Remark
	Specified Requirement		Min	Cr	Ni		
5	WNRF	SS304L	1 18.00	18.16	8.00	8.10	
	Size:- 1NPS XCL.150 S40S		2 18.00	18.14	8.00	8.19	
	Heat no:- SF6273A						
	Item code:- 16887430						
6.	WNRF	SS304L	1 18.00	18.28	8.00	8.14	
	Size:- 1 1/2 NPSX CL1.50 S40S		2 18.00	18.39	8.00	8.19	
	Heat no:- SF6273A		3 18.00	18.10	8.00	8.28	
	Item code :- 16887500		4 18.00	18.28	8.00	8.10	
			5 18.00	18.14	8.00	8.19	
			6 18.00	18.16	8.00	8.19	
			7 18.00	18.19	8.00	8.16	
			8 18.00	18.10	8.00	8.10	
						8.12	
73	WNRF	SS304L	1 18.00	18.19	8.00	8.19	
	Size:- 1 1/2 NPSX CL1.50 S40S (H2)		2 18.00	18.28	8.00	8.10	
	Heat no:- SF6273A						
	Item code:- 1913900922						
Instrument Identification: HITACHI XMET 8000 SMART				Serial No. : 811924			
Calibration Date : 06.03.2021				Calibration Due Date : 05.03.2022			
 Client/Vendor				 Tested By			
 Witness By				 Witne's By			



AADHYA ENGINEERING SERVICES

Works : 346/B/2, Beside Lalji Mulji Transport, GIDC, Makarpura, Vadodara-390010.

Email : testing.aes2019@gmail.com / aadhyaengineers@gmail.com

Contact : 9537530900 / 7567158821 / 8000296579



AADHYA ENGINEERING

PMI TEST REPORT

Test Report No:		AES/PMI/ 02	Date of Test :		14/06/2021	Page No.:	02
Sr. No.	Description	Material Spec.	Location/ Qty	Alloy Content (%)			Remark
			Min	C%	Ni		
26	WNRF	SS304	1	18.10	8.18		
	SIZE:- 1/2 NPS X CL300		2	18.28	8.20		
	S205		3	18.39	8.19		
	Heat no:- GF6L16A		4	18.10	8.14		
	Item code:- 17077270		5	18.38	8.16		
			6	18.14	8.19		
			7	18.19	8.12		
			8	18.28	8.10		
31	SWRF	SS304L	1	18.39	8.19		
	SIZE:- 1NPS XCL 300		2	18.10	8.14		
	S40S (NACE)		3	18.28	8.20		
	Heat no:- SF 6216A		4	18.39	8.39		
	Item code:- 11728803420		5	18.20	8.10		
			6	18.39	8.16		
			7	18.10	8.19		
			8	18.19	8.10		
			9	18.28	8.16		
			10	18.39	8.19		
			11	18.10	8.14		
			12	18.28	8.16		
			13	18.10	8.18		

Acceptable

Instrument Identification: HITACHI XMET 8000 SMART	Serial No. : 811924
Calibration Date : 06.03.2021	Calibration Due Date : 05.03.2022
	
Client /Vendor	Tested By
c. No & Dt - AES/ FM/017 (01-06-2019)	Rev No- 00



SANGHVI FORGING & ENGINEERING LTD.

FORGING IDENTIFICATION REPORT

OFFER NO : 5727

PO NO : P/6403/34366/AXHC201B-3
CLT NAME : TOYO ENGINEERING INDIA PRIVATE LTD.

DATE: 06/03/2021

PO DATE: 11/01/2021

SO NO	PO SR	HEAT NO	HT BATCH NO	ITEM DESCRIPTION	ITEM CODE	MATERIAL STD	DIMENSION STD	PO QTY	OFFER QTY	BALANCE QTY
9107395	1	SF 6216A	1F 28022021	2 NPS X CL 600 BLRF	15338391	ASTM A182 F3C4/304L (ED-2018)	ASME B16.5 (ED-2017)	10	10	Nil
9107395	3	SF 6216A	1F 28022021	1/2 NPS X CL 600 SWRF S80S	1106331403	ASTM A182 F3C4/304L (ED-2018)	ASME B16.5 (ED-2017)	11	11	Nil
9107395	5	SF 6216A	1F 28022021	1 NPS X CL 150 WNRF S40S	16887430	ASTM A182 F3C4/304L (ED-2018)	ASME B16.5 (ED-2017)	11	11	Nil
9107395	7	SF 6216A	1F 28022021	2 NPS X CL 150 WNRF S40S	16887762	ASTM A182 F3C4/304L (ED-2018)	ASME B16.5 (ED-2017)	11	11	Nil
9107395	12	SF 6024A	1F 28022021	6 NPS X CL 300 WNRF S10S (H2)	1128794977	ASTM A182 F3C4/304L (ED-2018)	ASME B16.5 (ED-2017)	14	14	Nil
9107395	14	SF 6216A	1F 28022021	2 NPS X CL 600 WNRF S40S	16500405	ASTM A182 F3C4/304L (ED-2018)	ASME B16.5 (ED-2017)	2	2	Nil
9107395	15	SF 6216A	1F 28022021	2 NPS X CL 600 WNRF S80S	16500415	ASTM A182 F3C4/304L (ED-2018)	ASME B16.5 (ED-2017)	4	4	Nil
9107395	17	SF 6024A	1F 28022021	6 NPS X CL 600 WNRF S40	16900700	ASTM A182 F3C4/304L (ED-2018)	ASME B16.5 (ED-2017)	10	10	Nil
9107395	26	SF 6216A	1F 28022021	1/2 NPS X CL 300 WNRF S80S	17C77270	ASTM A182 F3C4/304L (ED-2018)	ASME B16.5 (ED-2017)	2	2	Nil
9107395	27	SF 6216A	1F 28022021	1 NPS X CL 300 WNRF S40S	17C77332	ASTM A182 F3C4/304L (ED-2018)	ASME B16.5 (ED-2017)	12	12	Nil
9107395	28	SF 6216A	1F 28022021	2 NPS X CL 300 WNRF S40S	17077674	ASTM A182 F304/304L (ED-2018)	ASME B16.5 (ED-2017)	17	17	Nil
9107395	29	SF 6024A	1F 28022021	3 NPS X CL 300 WNRF S10S	17077830	ASTM A182 F304/304L (ED-2018)	ASME B16.5 (ED-2017)	13	13	Nil
9107395	31	SF 6216A	1F 28022021	1 NPS X CL 300 SWRF S40S (NACE)	11728803420	ASTM A182 F304/304L (ED-2018)	ASME B16.5 (ED-2017)	4	4	Nil
								13	13	Nil

TEST TO BE CARRIED OUT:

CHEMICAL :
 PHYSICAL :
 MICRO :
 IGC :
 HARDNESS :
 IMPACT :

Q.A.ENGINEER



FOR CLIENT/THIRD PARTY

- Product identified & stamped as "C" for test
- as per DTP, Spec & mtl spec.

- RMT copy & HT chart issued.



D.P. Panjwani

SANGHVI FORGING & ENGINEERING LTD.

FORGING IDENTIFICATION REPORT

OFFER NO : 5912

PO NO : P/6403/34366/AXHC201B-3

DATE: 11/05/2021

PO DATE: 11/01/2021

SO NO	PO SR	HEAT NO	ITEM DESCRIPTION	ITEM CODE	MATERIAL STD	DIMENSION STD	PO QTY	OFFER QTY	BALANCE QTY
9107395	4	SF 6273A	1 NPS X CL 600 SWRF S405 (NACE)	[1]729406039	ASTM A132 3C4L (ED-2018)	ASME B16.5 (ED-2015)	7	7	Nil
9107395	6	SF 6273A	1 1/2 NPS X CL 150 WNRF S405	[6]887500	ASTM A132 F304L (ED-2018)	ASME B16.5 (ED-2015)	17	17	Nil
9107395	23	SF 6273A	18 NPS X CL 600 WNRF SXS (H2)	[1]91390C922	ASTM A132 F304L (ED-2018)	ASME B16.5 (ED-2015)	2	2	Nil
9107395	24	SF 6273A	20 NPS X CL 600 WNRF THk= 17 MM (H2)	[1]728921935	ASTM A132 F304L (ED-2018)	ASME B16.5 (ED-2015)	1	1	Nil
9107395	30	SF 6273A	4 NPS X CL 300 WNRF S105	[1]7077903	ASTM A132 F304 (ED-2018)	ASME B16.5 (ED-2015)	10	10	Nil

TEST TO BE CARRIED OUT:

- CHEMICAL :
- PHYSICAL :
- MICRO :
- IGC : practice IEL at 20X & 250X .
- HARDNESS :
- IMPACT :

Q.A.ENGINEER



FOR CLIENT/ THIRD PARTY

Product identified & shaped as
for testing as per QAP, Spec & MTL Spec.

- QMTC copy q m/s held Reward
(3F 0305 2021 MT Better for all)



DRR
11/05/2021



AVTAR STEEL LIMITED
Manufacturers of Stainless Steel Long & Flat Products

Manufacturers of Stainless Steel Long & Flat Products

CIN No.: U27104DLT1996PLC078684



PED
2014/68/EU



TEST CERTIFICATE

Remarks -

We do not have the facility of testing H₂ and O₂ in our plant.

Melting Process - Electric Furnace Refining Through AOD

Country of origin of Goods - India

Anti-Mix Test Carriedout (Source PMI) and Found O.K.

Inspection and Dimensional Check Done and Found O.K.

Effects From Radioactivity Contamination

Losses and Additions Manufacturing

ii. Seven Hazardous Substances like Pb, Hg, Cd, Hexavalent Cr and others which are banned in RoHS

Material is Free From Hazardous Substances and is RoHS Compliant
Material Chemical Composition as per ASTM A182/ASTM 276-17/ASTM-A79-18¹/DIN EN 10088-3-2014/EN 10272, Nace MR 0172/ISO 15630 & MR 0103 -2015

www.ajtworld.com | PEI 2014/68/EU Approved, Certificate NO.01-202 IND-Q-18-0057

We Herby Certify That the Material Described Above has been checked and found to be in accordance with the specification.	
Date	07-04-2021
Place	WORKS , Bahalgarh, Sonipat, Haryana
F-QA-07,Rev.00	
HEAT NO.	SF 6273A
VERIFIED BY	Dhruv
WEIGHT	2570 KG.



Regd. Off.: 1501, 15th Floor, Aggarwal Corporate Heights, Netaji Subhash Place, Pitampura, Delhi-110034, India
Works : Village Jat Joshi, Bahalgarh, Delhi Road, Sonepat, Haryana-131021, India
E-mail : info@avtarsteel.com, accounts@avtarsteel.com, Website : www.avtarsteel.com

Works : Village Jat Joshi, Bahalgadh, Deoli Road, Sonarpur, Jharkhand | Email : intersteel.com Website : www.intersteel.com

Works : Village Jai Joshi, Baridargam, Dehradoon, Ph. : +91-11-66066666, E-mail : info@avtarsteel.com, accounts@avtarsteel.com, Website : www.avtarsteel.com



Sanghvi Forging & Engineering Ltd.

244/6-7 G.I.D.C Ind. Estate Waghodia - 391 760 Dist.: Baroda, Gujarat, India

Ph.: +91-2668 - 263020 / 262201 ● Fax : +91- 2668 - 263411

E-mail : qc@sanghviforge.com ● Website : www.sanghviforge.com

Chemical Test Reports

Page 1 of 1

Report No.: 2020-21/SFEL/CHE/001

Date: 27.05.2021

To,
Sanghvi Forging & Engineering Ltd.
244/6-7 G.I.D.C. Ind. Estate,
Waghodia - 391 760 , Baroda

TEST : Chemical Test.

Test Method : SFEL/SPEC01, ASTM E-1507

Instrument Utilized : Spectromax-German make

Test performed at.: Sanghvi Forging & Engineering Ltd. -- Testing Division (Lab)

Condition of Sample	: FINISHED MATERIAL
Nature of Sample	: TEST COUPEN
Specification	: ASTM A 182 F304/304L
Date of Completion of Test	: 27.05.2021

Sample ID : SF 6273A

Heat No. : A-2885

	Required	Result
Carbon (%)	0.03 MAX.	--
MANGANESE (%)	2.00 MAX.	1.550 ✓
PHOSPHORUS (%)	0.045 MAX.	0.044 ✓
SULFUR (%)	0.030 MAX.	0.011 ✓
SILICON (%)	1.00 MAX.	0.350 ✓
NICKEL (%)	8.00-11.00	8.050 ✓
CHROMIUM (%)	18.0-20.0	18.340 ✓
NITROGEN (%)	0.11 MAX.	0.080 ✓

Remark : Results Confirms to ASTM A 182 GRADE F304/304L with respect to test carried out.

Amitesh

checked by



Witnessed By



Authorized Signatory

Note.: The results relate only to the sample tested



SANGHVI FORGING & ENGINEERING LTD

244/6-7 G.I.D.C Ind. Estate Waghodia - 391 760 Dist.: Baroda, Gujarat, India
Ph.: +91-2668 - 263020 / 262201 Fax : +91- 2668 - 263411
Email : qc@sanghviforge.com Website : www.sanghviforge.com

Physical Test Reports

Page 1 of 1

Report No.: 2021-22/SFEL/PHY/005

Date: 29/05/2021

To,
Sanghvi Forging & Engineering Ltd.
244/6-7 G.I.D.C. Ind. Estate,
Waghodia - 391 760 , Baroda

TEST : Tensile Test.
Test Method : SFEL/UTM01, ASTM E-8
Instrument Utilized : FIE-UTE -60T
Serial No.: 5/2007-3650

CALIBRATION DUE DATE : 09/02/2022

Test performed at.: Sanghvi Forging & Engineering Ltd. -- Testing Division (Lab)

Condition of Sample : Solution Annealed
Nature of Sample : Test Coupan
Heat Treatment Batch No. : 3F 03052021 ✓
Specification : ASTM A182 F304/304L ✓

Sample ID : SF 6273A ✓

HEAT NO : RSL-B1571

	Required	Result
	F304L	F304
Gauge Dia (mm)	--	--
Area (mm ²)	--	12.33
Gauge Length (mm)	--	119.451
Final Length (mm)	--	50
Final Dia (mm)	--	77.54
1% Proof Stress (N/mm ²)	--	6.08
0.2% Proof Stress (N/mm ²)	170 (Min)	205 (Min)
UTS (N/mm ²)	485 (Min)	515 (Min)
% Reduction in area	50 (Min)	50 (Min)
% Elongation	30 (Min)	30 (Min)
Hardness (BHN)	---	55.08 ✓
Fracture	---	140 - 149 W.G.L

Remark : Results Confirms to ASTM A 182 F304/304L with respect to test carried out.

Checked by

WITNESSED BY
29/05/2021
TUV
Technical Inspection Services
India

Witnessed By

LTD. * SAN GHVI FORGING & ENGINEERING LTD.
Waghodia, Baroda
Authorized Signatory

Note.: The results relate only to the sample tested



MET-HEAT ENGINEERS PVT. LTD.

MHEPL / FM/17

METALLURGICAL LABORATORY ON APPROVED LIST OF VARIOUS
GOVT. DEPARTMENTS & PUBLIC SECTOR UNDERTAKINGS (SINCE 1975)



TC-7726
ORIGINAL COPY

857/2, G.I.D.C. Industrial Estate, ERDA Road, Makarpura, Vadodara - 390 010, Gujarat, India.
Telephone : +91-265-2643655, 2648026, 7490052374, 7490035655
E-mail : info@metheat.com • Website : www.metheat.com • CIN : U28939GJ1996PTC029934

TEST REPORT

WO:21-05-1259 Sr. No. 1M / 1 -60-Cr-Hold

ULR - TC772621000030873F

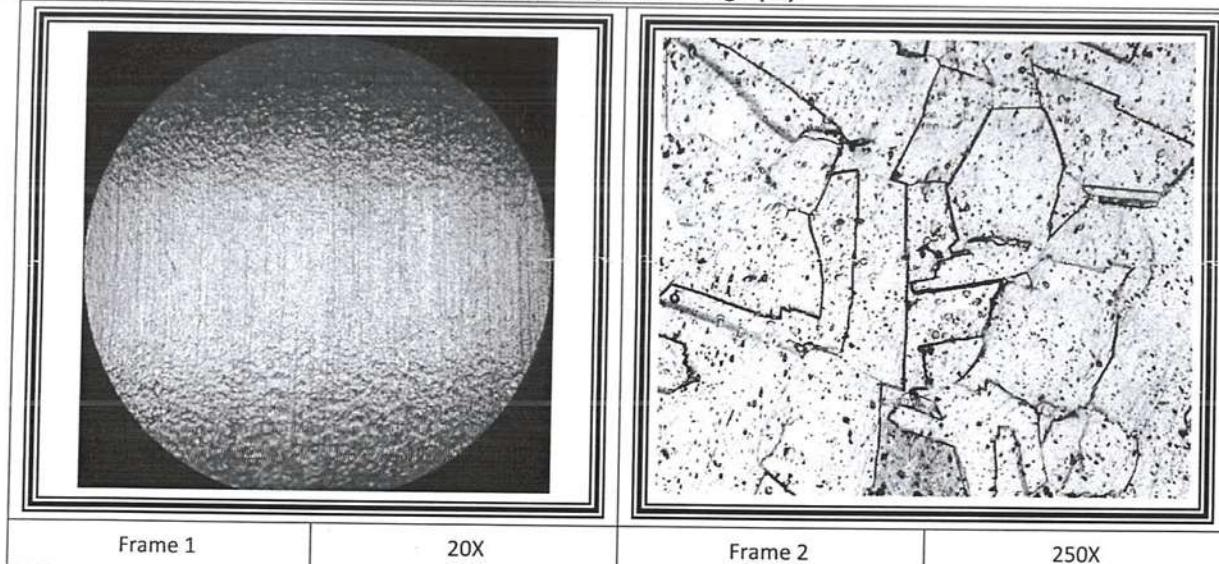
Test Report No. : 531BY-21/ 2021
Date of Report : 24-05-2021
Date of Receipt : 21-05-2021

Customer's Name : SANGHVI FORGING AND ENGG LTD-WAGHODIA
244/6 & 7, GIDC IND ESTATE, WAGHODIA-391760, DIST-BARODA, MR.JATIN 02668-262105, 263020
Particulars of Sample : FORGE PIECE
Material Specification : ASTM A-182 GRADE-F-304/304L:2020
Sample Stamped as : TUV of TUV-INDIA
Identification of Sample : LOT NO:SF 6273A HEAT NO:A-2885
Customer's Ref No : CHALLAN NO:OT1857

531BY-21 IGC TEST

Date of Performance : 24-05-2021

Test Method : As Per ASTM A-262-15 Practice-E(With photomicrograph)



Frame 1

20X

Frame 2

250X

Condition of Test Specimen :

Sensitized at 675 Degree Cent. For 1 Hour

Test Duration :

15 Hours

Test Details :

Boiled in Copper, Copper Sulfate & Sulfuric Acid Solution

Result of Bend Test :

Former Diameter : 1xt = 9.0mm

Angle of bend : 180 Degree

Magnification : 20X

Observation :

'Orange Peel' surface observed at bent portion (REF. FIG.-13). No IGC crack.

Microstructure of Longitudinal section (Cl. No:46.1.1) :

250X

Magnification :

Step Structure

Observation. :

Bend area of sample is free of IGC fissures, cracks or grain dropping.

SAMPLE IS ACCEPTABLE AS PER ASTM A 262-15 PRACTICE-E

Reviewed By



Authorized Signatory

A.M.Dave (QM)

End of Report-----



Page 1 of 1

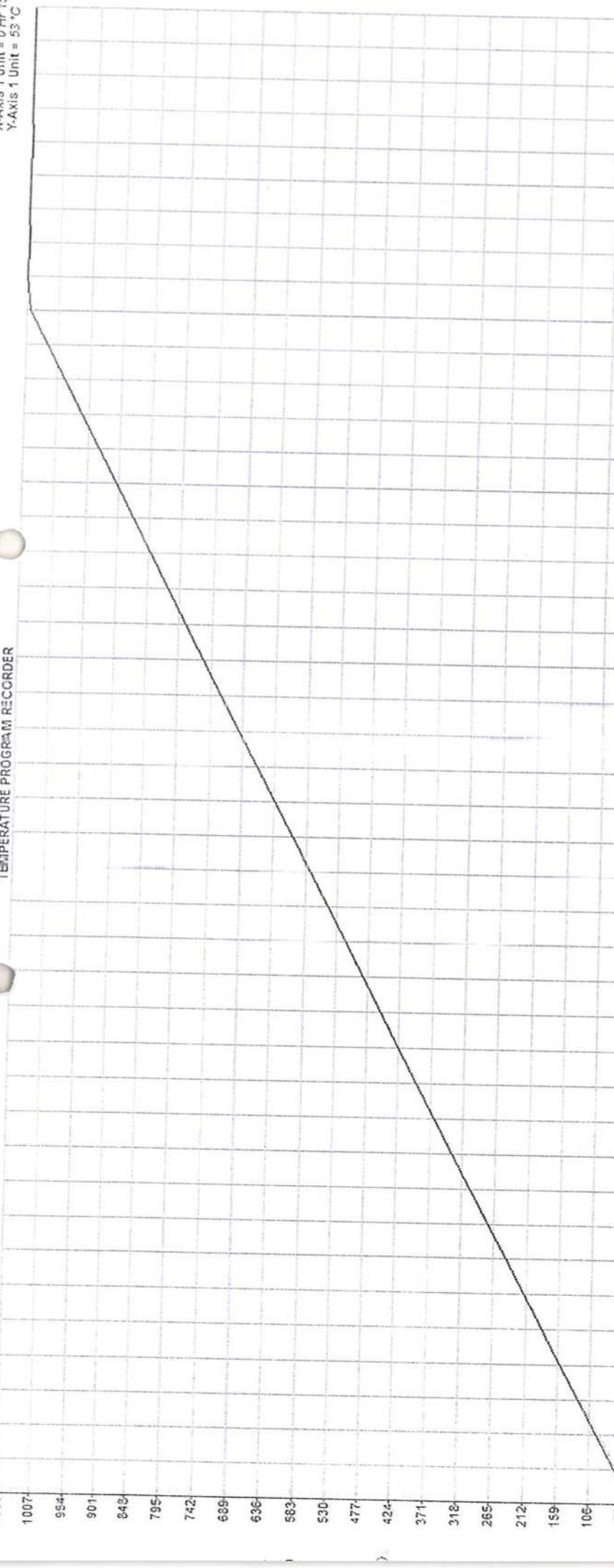


- (1) Sample(s) not drawn by MHEPL. The results relate only to the sample(s) tested.
- (2) This Certificate shall not be reproduced, except in full, without the written approval of MHEPL.
- (3) If balance material is available after testing, it will be retained for 15 days maximum. If customer wants to retain it for one month from this date, he has to inform in written or he has to collect the same.
- (4) While Met-Heat has made the best endeavors to provide accurate and reliable information, Met-Heat is not responsible for any financial liability due to act of omission or error made.

Time : 03/05/2021 10:30
o : 03/05/2021 21:15

Sanghvi Forgings & Engineering Ltd.
244/6, G.I.D.C. Estate, Mehsode
TEMPERATURE PROGRAM RECORDER

X-Axis 1 Unit = 0 Hr 15 Min
Y-Axis 1 Unit = 53 °C



0 10:30 10:45 11:00 11:15 11:30 11:45 12:00 12:15 12:30 12:45 13:00 13:15 13:30 13:45 14:00 14:15 14:30 14:45 15:00 15:15 15:30 15:45 16:00 16:15 16:30 16:45 17:00 17:15 17:30 17:45 18:00 18:15 18:30 18:45 19:00 19:15 19:30 19:45 20:00 20:15 20:30 20:45 21:00 21:15
Time

BATCH NO - 3F C3052021

SOAKING TEMP 1060° (SOLUTION ANNEALING)

QUENCH TIME 2:00 HRS



MAT.DESC.	QTY	MAT. GRADE	LOT NO
1 NPS X CL 600 SWRF S405 (NACE)	20	ASTM A182 F304/304L	SF 62273A
1 1/2 NPS X CL 150 WNRF S405	17	ASTM A182 F304/304L	SF 62273A
18 NPS X CL 600 WNRF S405 (H2)	2	ASTM A182 F304/304L	SF 62273A
20 NPS X CL 600 WNRF THK= 17 MM (H2)	1	ASTM A182 F304/304L	SF 62273A
4 NPS X CL 300 WNRF S105	10	ASTM A182 F304/304L	SF 62273A
TEST BLOCK (200 X 100 X THK 50 MM)	1	ASTM A182 F304/304L	SF 62273A
24 NPS X CL 300 WNLG THK= 10 MM	4	ASTM/SA182 F310	SF 6226AB
24 NPS X CL 300 WNLG THK= 20 MM	7	ASTM/SA182 F310	SF 6226AB

**Inspection Certificate
According To EN10204-3.1**

Customer :	SANGHVI FORGING & ENGINEERS LTD VADODARA	TC. No. : MTC-B/1678
SPECIFICATION :	ASTM A276	DATE OF ISSUE : 24/11/2020
MATERIALS :	S.S HOT ROLLED ROUND BARS	P.O No. : 452002/647
GRADE :	S S 304L	P.O Date : 12/10/2020
QUANTITY :	4 445 MT	

Grade	Heat No.	Size(mm)	Length(mm)	PCS	Weight (MT)	Colour Code
304L	RSL-B771	63.00	STD	3	0.445	YELLOW+BLACK
304L	RSL-B310	56.00	STD	5	0.815	YELLOW+BLACK
304L	RSL-B913	73.00	STD	6	1.245	YELLOW+BLACK
304L	RSL-B913	85.00	STD	8	2.140	YELLOW+BLACK
		TOTAL		22	4.445	

CHEMICAL COMPOSITION(Weight%)										
Heat no.	C	Si	Mn	P	S	Cr	Ni	Mo	Cu	N2
Min.	-	-	-	-	-	-	-	-	-	-
Max.	0.030	1.00	2.00	0.045	0.030	20.00	8.00	-	-	-
RSL-B771	0.024	0.51	1.50	0.039	0.011	18.20	8.08	-	-	0.1000
RSL-B310	0.024	0.42	1.65	0.044	0.026	18.21	8.03	0.23	0.30	0.0935
RSL-B913	0.024	0.48	1.39	0.044	0.018	18.18	8.03	0.40	0.49	0.0852
								0.44	0.44	0.0917

Specified Value	Tensile Strength (Mpa)	Yield Strength(0.2%) (mpa)	Elongation%	Reduction of Area%	Impact Value (Joules) At RT (L)(ASTM E23)				Hardness (BHN)(ASTM F10)
					1	2	3	Avg.	
Min.	465	170	40	50	-	-	-	-	-
Max.	-	-	-	-	-	-	-	-	-
RSL-B771	528	366	46	73	-	-	-	-	151/155
RSL-B310	605	333	47	69	-	-	-	-	165/166
RSL-B913	611	366	41	70	-	-	-	-	165/166

Requirements	Metallurgical Testing								GRAIN SIZE (E112)	Macro Test (ASTM E381)		
	INCLUSION RATING (ASTM E45)											
	TYPE A		TYPE B		TYPE C		TYPE D					
Thin	Heavy	Thin	Heavy	Thin	Heavy	Thin	Heavy	Thin	Heavy			
-	-	-	-	-	-	-	-	-	-	-		
-	-	-	-	-	-	-	-	-	-	-		

Remarks:-

- Process Route: F-AQD-CCM-HOT ROLLING
- PMI test done 100% & found satisfactory
- CaSi treatment done
- Material is free from Radioactive and mercury contamination
- Material is identified with Heat No/Grade/Size/Material Colour code
- Visual and dimensional inspection found satisfactory as per specification
- Material is identified with Heat No/Grade/Size/Material Colour code

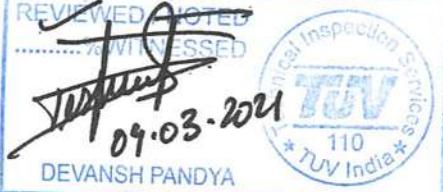
I hereby certify that above material described herein has been manufactured & tested with satisfactory results in accordance with specification & requirements.



HEAT NO.	SF6213A, SF6214A, SF6215A,
VERIFIED BY	<i>[Signature]</i>
WEIGHT	4445 Kg.

Technical content

REVIEWED / NOTED
..... / WITNESSED
[Signature]
09.03.2021
DEVANSH PANDYA





MET-HEAT ENGINEERS PVT. LTD.

MHEPL / FM/17

METALLURGICAL LABORATORY ON APPROVED LIST OF VARIOUS
GOVT. DEPARTMENTS & PUBLIC SECTOR UNDERTAKINGS (SINCE 1975)



857/2, G.I.D.C. Industrial Estate, ERDA Road, Makarpura, Vadodara - 390 010, Gujarat, India.
Telephone : +91-265-2632374, 2643655, 2648026, 7490052374, 7490035655
E-mail : info@metheat.com • Website : www.metheat.com • CIN : U28939GJ1996PTC029934

TC-7726
ORIGINAL COPY

TEST REPORT

WO:21-01-1275 Sr. No. 11C / 11 -60-Cr-

Customer's Name : SANGHVI FORGING AND ENGG LTD-WAGHODIA
244/6 & 7, GIDC IND ESTATE, WAGHODIA-391760, DIST-BARODA, MR.JATIN 02668-262105, 263020
Particulars of Sample : FORGE PIECE
Material Specification : A-182 GRADE-F-304/304L:2020
Identification of Sample : ID:H.NO:RSL-B913 L.NO:SF6216A ✓
Customer's Ref No : CH.NO:OT-1807

ULR - TC772621000003534F

Test Report No. : 251KG-21/ 2021
Date of Report : 19-01-2021
Date of Receipt : 19-01-2021

251KG-21 CHEMICAL ANALYSIS [SPECTRO FE BASE]

Date of Performance : 19-01-2021

Test Method : ASTM E-1086:14 & IS-9879:1998 & JIS G-1253:2013
Equipment Sr. No.: B-15044200035 Make : Shimadzu Model : OES-5500 II Cal. Dt: 02-Mar-2020 Due Dt.: 01-Mar-2021

	Result	Required Value
%Carbon (C)	0.0260 ✓	0.035 max.
%Silicon (Si)	0.3790 ✓	1.05 max.
%Manganese (Mn)	1.5420 ✓	2.04 max.
%Phosphorus (P)	0.0390 ✓	0.055 max.
%Sulphur (S)	0.0130 ✓	0.035 max.
%Nickel (Ni)	8.0050 ✓	7.9-11.15
%Chromium (Cr)	18.2160 ✓	17.8-20.2
%Nitrogen (N)	0.0626 ✓	0.11 max.

The above results are meeting with chemical requirements of A-182 GRADE-F-304/304L:2020 with respect of test carried out.



Reviewed By

Authorized Signatory

A.M.Dave (QM) / M.G.Dave (MD)

-----End of Report-----

Witnessed By



- (1) Sample(s) not drawn by MHEPL. The results relate only to the sample(s) tested.
(2) This Certificate shall not be reproduced, except in full, without the written approval of MHEPL.
(3) If balance material is available after testing, it will be retained for 15 days maximum. If customer wants to retain it for one month from this date, he has to inform in writing or he has to collect the same.
(4) While Met-Heat has made the best endeavors to provide accurate and reliable information, Met-Heat is not responsible for any financial liability due to act of omission or error made.

Page 1 of 1



SANGHVI FORGING & ENGINEERING LTD

244/6-7 G.I.D.C Ind. Estate Waghodia - 391 760 Dist.: Baroda, Gujarat, India

Ph.: +91-2668 - 263020 / 262201 Fax : +91- 2668 - 263411

Email : qc@sanghviforge.com Website : www.sanghviforge.com

Physical Test Reports

Page 1 of 1

Report No.: 2021-22/SFEL/PHY/002

Date: 16/04/2021

To,
Sanghvi Forging & Engineering Ltd.
244/6-7 G.I.D.C. Ind. Estate,
Waghodia - 391 760 , Baroda

TEST : Tensile Test.

Test Method : SFEL/UTM01, ASTM E-8

Instrument Utilized : FIE-UTE -60T

Serial No.: 5/2007-3650

CALIBRATION DUE DATE : 09/02/2022

Test performed at.: Sanghvi Forging & Engineering Ltd. -- Testing Division (Lab)

Condition of Sample : Solution Annealed
Nature of Sample : Test Coupan
Heat Treatment Batch No. : 1F 28022021
Specification : ASTM A182 F304/304L

Sample ID : SF 6216A

HEAT NO : RSL-B913

	Required	Result
	F304L	F304
Gauge Dia (mm)	--	--
Area (mm ²)	--	--
Gauge Length (mm)	--	--
Final Length (mm)	--	--
Final Dia (mm)	--	--
1% Proof Stress (N/mm ²)	--	--
0.2% Proof Stress (N/mm ²)	170 (Min)	205 (Min)
UTS (N/mm ²)	485 (Min)	515 (Min)
% Reduction in area	50 (Min)	50 (Min)
% Elongation	30 (Min)	30 (Min)
Hardness (BHN)	----	----
Fracture	----	----

Remark : Results Confirms to ASTM A 182 F304/304L with respect to test carried out.

Checked by

(Signature)
Witnessed By *Vinay Desai* 16/04/2021
vinay Desai
TUV India Technical Inspection Services
Waghodia
SANGHVI FORGING & ENGINEERING LTD.

Authorized Signatory

Note.: The results relate only to the sample tested



MET-HEAT ENGINEERS PVT. LTD.

MHEPL /FM/17

METALLURGICAL LABORATORY ON APPROVED LIST OF VARIOUS
GOVT. DEPARTMENTS & PUBLIC SECTOR UNDERTAKINGS (SINCE 1975)

857/2, G.I.D.C. Industrial Estate, Makarpura, ERDA Road, Vadodara - 390 010, Gujarat, India.

Telephone : +91-265-2632374, 2643655, 2648026, 7490052374, 7490035655

E-mail : info@metheat.com • Website : www.metheat.com • CIN : U28939GJ1996PTC029934

TC-7726
ORIGINAL COPY

TEST REPORT

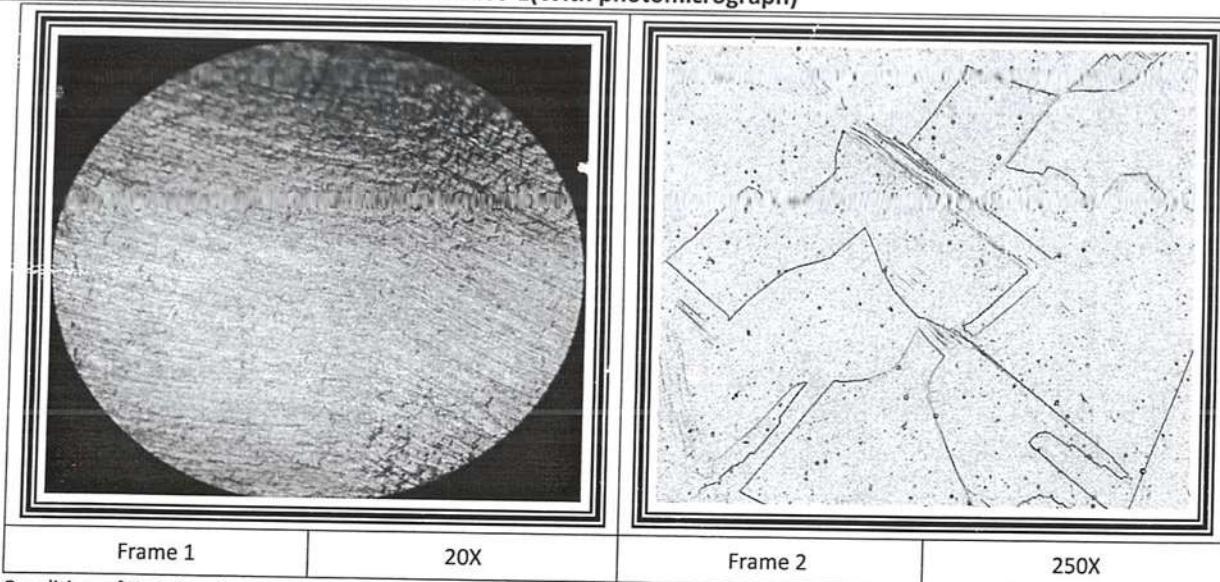
WO:21-03-1429 Sr. No. 1M / 2 -60-Cr- Hold

Customer's Name	: SANGHVI FORGING AND ENGG LTD-WAGHODIA 244/6 & 7, GIDC IND ESTATE, WAGHODIA-391760, DIST-BARODA, MR.JATIN 02668-262105, 263020	ULR - TC772621000019032F
Particulars of Sample	: FORGE PIECE	Test Report No. : 553MY-21/ 2021
Material Specification	: ASTM A-182 GRADE-F-304/304L:2020	Date of Report : 23-03-2021
Sample Stamped as	: TUV of TUV-INDIA	Date of Receipt : 22-03-2021
Identification of Sample	: LOT NO:SF 6216A HEAT NO:RSL-B913	
Customer's Ref No	: CH.NO:OT1841	

553MY-21 IGC TEST

Test Method : As Per ASTM A-262-15 Practice-E(With photomicrograph)

Date of Performance : 23-03-2021



Frame 1

20X

Frame 2

250X

Condition of Test Specimen :

Sensitized at 675 Degree Cent. For 1 Hour

Test Duration :

15 Hours

Test Details :

Boiled in Copper, Copper Sulfate & Sulfuric Acid Solution

Result of Bend Test :

Former Diameter : 1xt = 9.0mm

Angle of bend : 180 Degree

Magnification : 20X

Observation :

'Orange Peel' surface observed at bent portion (REF. FIG.-13). No IGC crack.

Microstructure of Longitudinal section (Cl. No:46.1.1) :

Magnification :

250X

Observation. :

Step Structure

Bend area of sample is free of IGC fissures, cracks or grain dropping.

SAMPLE IS ACCEPTABLE AS PER ASTM A 262-15 PRACTICE-E

Reviewed By



Authorized Signatory

A.M.Dave (QM)

End of Report

REVIEWED / NOTED

% WITNESSED

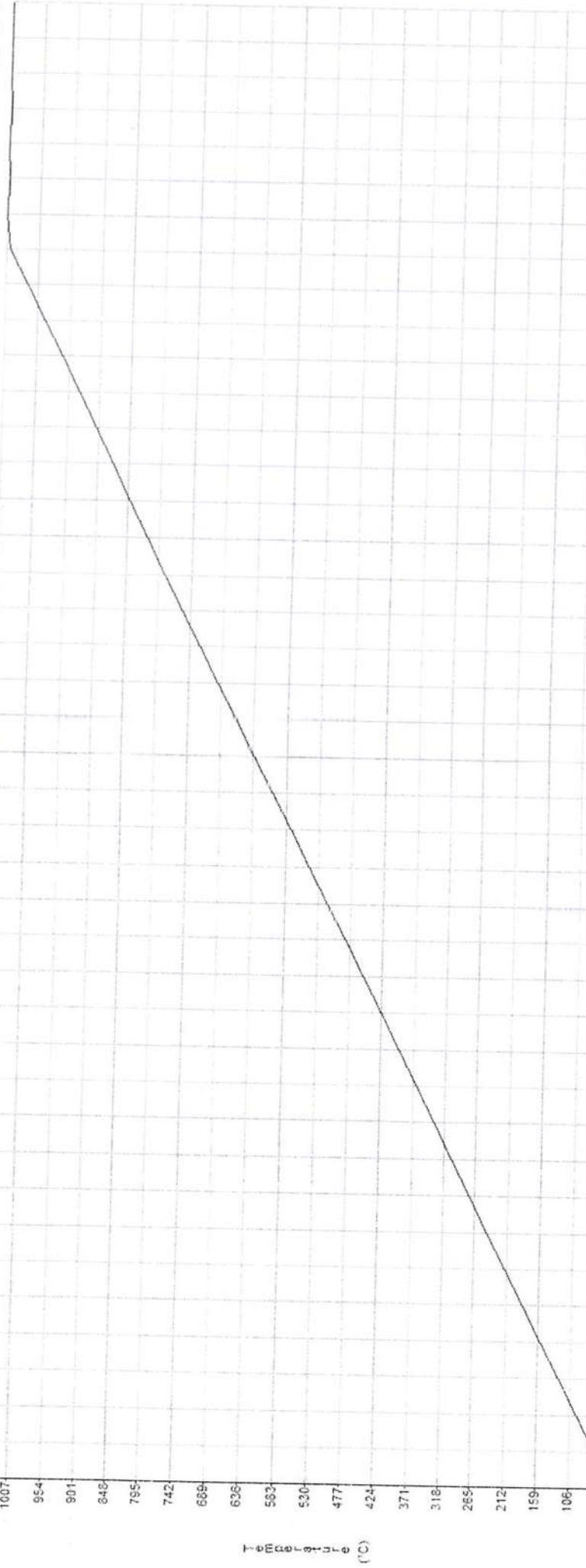
23/03/2021
BHARAT PARMAR

Witnessed By

Page 1 of 1



- (1) Sample(s) not drawn by MHEPL. The results relate only to the sample(s) tested.
- (2) This Certificate shall not be reproduced, except in full, without the written approval of MHEPL.
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- (4) While Met-Heat has made the best endeavors to provide accurate and reliable information, Met-Heat is not responsible for any financial liability due to act of omission or error made.



0 10:30 10:45 11:00 11:15 11:45 12:00 12:15 12:30 12:45 13:00 13:15 13:30 13:45 14:00 14:15 14:30 14:45 15:00 15:15 E 15:30 C 15:45 16:00 ~6:15 16:30 16:45 17:00 17:15 17:30 17:45 18:00 18:15 18:30 18:45 19:00 19:15 19:45 20:00 20:15 20:30 20:45
28/02/2021

BATCH NO : 1 : 28/02/2021

SOAKING TEMP 1060° (SOLUTION ANNEALING)

SOAKING TIME 1:50 HRS

QUENCH IN WATER ITEM BELOW 260°C

MAT.DESC.	QTY	MAT. GRADE	LOT NO	MAT.DESC.	QTY	MAT. GRADE	LOT NO
2 NPS X CL 600 BLRF	10	ASTM A182 F304 /304L	SF 6216A	6 NPS X CL 600 WNRF S40	2	ASTM A182 F304 /304L	SF 6024A
1/2 NPS X CL 600 SWRF S80S	11	ASTM A182 F304 /304L	SF 6216A	1/2 NPS X CL 300 WNRF S80S	12	ASTM A182 F304 /304L	SF 6216A
1 NPS X CL 150 WNRF S40S	11	ASTM A182 F304 /304L	SF 6216A	1 NPS X CL 300 WNRF S40S	17	ASTM A182 F304 /304L	SF 6216A
2 NPS X CL 150 WNRF S40S	14	ASTM A182 F304 /304L	SF 6216A	2 NPS X CL 300 WNRF S40S	13	ASTM A182 F304 /304L	SF 6216A
6 NPS X CL 300 WNRF S10S (H2)	2	ASTM A182 F304 /304L	SF 6224A	3 NPS X CL 300 WNRF S10S	4	ASTM A182 F304 /304L	SF 6024A
2 NPS X CL 600 WNRF S40S	4	ASTM A182 F304 /304L	SF 6216A	1 NPS X CL 300 SWRF S40S (NACE)	13	ASTM A182 F304 /304L	SF 6216A
2 NPS X CL 600 WNRF S80S	10	ASTM A182 F304 /304L	SF 6216A	TEST BLOCK (200 X 100 X THK 50 MM)	1	ASTM A182 F304 /304L	SF 6216A
TEST BLOCK (200 X 100 X THK 60 MM)	1	ASTM A182 F304 /304L	SF 6024A	6 NPS X CL 600 BLRF	1	ASTM A182 F304 /304L	SF 6024A

REVIEWED / NOTED
WITNESSED
09.03.2021
DEVANSH PANDYA





Dimension	Target	LTL	UTL	1	2				
1) O.D Ø	110.0	108.5	111.5	110.16	110.15	-	-	-	-
2) RF DIA Ø	50.8	49.8	51.8	51.02	50.91	-	-	-	-
3) HUB DIA Ø	49.0	47.5	50.5	49.04	49.23	-	-	-	-
4) PIPE DIA Ø	33.4	32.4	35.4	33.41	33.62	-	-	-	-
5) SOCKET ID Ø	-	-	-	-	-	-	-	-	-
6) SCHEDULE ID Ø	26.60	25.84	27.36	26.89	26.74	-	-	-	-
7) FLANGE THK	12.7	12.7	15.7	12.94	-2.90	-	-	-	-
8) VELDNECK HT	54.0	52.5	55.5	54.11	54.03	-	-	-	-
9) PCD Ø	79.4	77.9	80.9	79.57	79.65	-	-	-	-
10) HOLE DIA Ø	15.88	15.68	16.08	15.91	15.93	-	-	-	-
11) DEPTH OF SOCKET	-	-	-	-	-	-	-	-	-
12) RF HEIGHT	2.00	-	-	2.08	2.07	-	-	-	-
13) NO OF HOLE	4.00	-	-	OK	OK	-	-	-	-

AUTHORISED BY



W.O.NO / P.O. NO :-9107395
 MATERIAL GRADE : ASTM A182 F304L
 ITEM DESCRIPTION :-1 1/2 NPS X CL 150 WNRF S405
 LOT QTY

SANGHVI FORGING & ENGG. LTD.
INSPECTION REPORT

DATE: 14/06/2021

LOT NO: SF 6273A

SR NO. 6

Dimension	Target	LTL	UTL	1	2	3	4	5	6	7	8	
1) OD Ø	125.0	123.5	126.5	125.11	125.07	125.07	125.13	125.00	125.19	125.04	125.17	-
2) RF DIA Ø	73.0	72.0	74.0	73.10	73.27	73.24	73.23	73.16	73.05	73.12	73.22	-
3) HUB DIA Ø	65.0	63.5	66.5	65.16	65.26	65.26	65.08	65.17	65.08	65.07	65.11	-
4) PIPE DIA Ø	48.3	47.3	50.3	48.48	48.59	48.57	48.47	48.39	48.50	48.50	48.55	-
5) SOCKET ID Ø	-	-	-	-	-	-	-	-	-	-	-	-
6) SCHEDULE ID Ø	40.90	40.14	41.66	41.19	41.13	41.07	40.91	41.20	41.12	40.95	40.92	-
7) FLANGE THK	15.9	15.9	18.9	16.12	15.96	16.12	16.03	16.13	16.02	16.09	15.92	-
8) WELDNECK HT	60.0	58.5	61.5	60.12	60.13	60.05	60.02	60.07	60.11	60.16	60.13	-
9) PCD Ø	98.4	96.9	99.9	98.43	98.46	98.65	98.48	98.53	98.65	98.46	98.67	-
10) HOLE DIA Ø	15.88	15.68	16.08	16.00	16.08	15.89	16.05	15.96	16.04	15.96	15.93	-
11) DEPTH OF SOCKET	-	-	-	-	-	-	-	-	-	-	-	-
12) RF HEIGHT	2.00	-	-	2.04	2.06	2.08	2.07	2.07	2.08	2.03	2.06	-
13) NO OF HOLE	4.00	-	-	OK	CK	OK	OK	OK	OK	OK	OK	-

IMPORTANT NOTE : ALL DIMENSIONS ARE IN MM
INSPECTED: VISUAL, DIMENSION & MARKING

AUTHORISED BY



QC. ENGG.
Devansh Pandya



SANGHVI FORGING & ENGG. LTD.
INSPECTION REPORT



W.O.NO / P.O. NO. :-9107395
MATERIAL GRADE : ASTM A182 F304
ITEM DESCRIPTION :-1/2 NPS X CL 300 WNRF SB05
LOT QTY

DATE: 14/06/2021

LOT NO.: SF 6216A

SR NO. 26

Dimension	Target	LTL	UTL	1	2	3	4	5	6	7	8	-
1) OD Ø	95.0	93.5	96.5	95.17	95.02	95.16	95.12	95.03	95.15	95.19	95.10	-
2) RF DIA Ø	34.9	33.9	35.9	35.15	34.97	35.14	35.04	35.14	35.09	35.00	35.17	-
3) HUB DIA Ø	38.0	36.5	39.5	38.08	38.11	38.05	38.08	38.26	38.22	38.11	38.01	-
4) PIPE DIA Ø	21.3	20.3	23.3	21.56	21.45	21.38	21.34	21.52	21.40	21.55	-	-
5) SOCKET ID Ø	-	-	-	-	-	-	-	-	-	-	-	-
6) SCHEDULE ID Ø	13.80	13.04	14.56	14.00	14.00	13.95	13.96	13.88	14.00	14.01	13.86	-
7) FLANGE THK	2.7	2.7	5.7	2.73	2.80	2.84	2.89	2.91	2.77	2.95	2.95	-
8) WELDNECK HT	51.0	49.5	52.5	51.28	51.12	51.07	51.29	51.20	51.15	51.03	51.12	-
9) PCD Ø	66.7	65.2	68.2	66.95	66.74	66.79	66.74	66.88	66.76	66.73	66.84	-
10) HOLE DIA Ø	15.88	15.68	16.08	16.07	15.93	16.00	16.02	15.89	15.90	15.94	15.90	-
11) DEPTH OF SOCKET	-	-	-	-	-	-	-	-	-	-	-	-
12) RF HEIGHT	2.00	-	-	2.02	2.09	2.02	2.06	2.04	2.08	2.02	2.03	-
13) NO OF HOLE	4.00	-	-	OK	-							

IMPORTANT NOTE : ALL DIMENSIONS ARE IN MM
INSPECTED: VISUAL, DIMENSION & MARKING

AUTHORISED BY



W.O.NO / P.O. NO. -9107395
 MATERIAL GRADE : ASTM A182 F304L
 ITEM DESCRIPTION :- 18 NPS X CL 600 WNRF SA05 (H2)
 LOT QTY

2

LOT NO.	Dimension	Target	LTL	UTL	1	2	3	4	5	6	7	8	9	10	11	12	13
1) OD Ø	-	745.0	743.5	746.5	745.1C	745.18	-	-	-	-	-	-	-	-	-	-	-
2) RF DIA Ø	533.4	532.4	534.4	533.59	533.42	-	-	-	-	-	-	-	-	-	-	-	-
3) HUB DIA Ø	546.0	544.5	547.5	546.17	546.24	-	-	-	-	-	-	-	-	-	-	-	-
4) PIPE DIA Ø	457.0	456.0	459.0	457.19	457.19	-	-	-	-	-	-	-	-	-	-	-	-
5) SOCKET ID Ø	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6) SCHEDULE ID Ø	437.90	437.14	438.66	437.93	438.00	-	-	-	-	-	-	-	-	-	-	-	-
7) FLANGE THK	82.6	82.6	85.6	82.86	82.84	-	-	-	-	-	-	-	-	-	-	-	-
8) WELDNECK HT	184.0	182.5	185.5	184.30	184.04	-	-	-	-	-	-	-	-	-	-	-	-
9) PCD Ø	654.0	652.5	655.5	654.12	654.26	-	-	-	-	-	-	-	-	-	-	-	-
10) HOLE DIA Ø	44.45	44.25	44.65	44.65	44.51	-	-	-	-	-	-	-	-	-	-	-	-
11) DEPTH OF SOCKET	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12) RF HEIGHT	7.00	-	-	7.04	7.05	-	-	-	-	-	-	-	-	-	-	-	-
13) NO OF HOLE	20.00	-	-	OK	CK	-	-	-	-	-	-	-	-	-	-	-	-

IMPORTANT NOTE : ALL DIMENSIONS ARE IN MM
 INSPECTED: VISUAL, DIMENSION & MARKING

Q.C. ENGG.

AUTHORISED BY



W.O.NO / P.O. NO. :9107395

MATERIAL GRADE : ASTM A182 F304L

ITEM DESCRIPTION :-1 NPS X CL 300 SWRF S405 (NACE)

LOT QTY

13

SANGHVI FORGING & ENGG. LTD.
INSPECTION REPORT

DATE: 14/06/2021

SR NO. 31

LOT NO: SF 6216A

Dimension	Target	LTL	UTL	1	2	3	4	5	6	7	8	9	10
1) OD Ø	125.0	123.5	126.5	125.23	125.00	125.15	125.03	125.08	125.05	125.17	125.25	125.01	125.25
2) RF DIA Ø	50.8	49.8	51.8	51.03	51.02	50.86	50.88	51.00	50.96	51.01	51.05	50.86	51.00
3) HUB DIA Ø	54.0	52.5	55.5	54.01	52.14	54.01	54.00	54.03	54.14	54.03	54.03	54.29	54.14
4) PIPE DIA Ø	-	-	-	-	-	-	-	-	-	-	-	-	-
5) SOCKET ID Ø	34.5	34.3	34.8	34.53	34.67	34.67	34.62	34.69	34.56	34.63	34.70	34.50	34.57
6) SHEDUAL ID Ø	26.60	25.84	27.36	26.88	26.83	26.78	26.64	26.69	26.75	26.75	26.74	26.88	26.67
7) FLANGE THK	15.9	15.9	18.9	12.00	13.00	14.00	14.00	15.00	16.00	17.00	18.00	19.00	21.00
8) SOCKET HT	25.0	25.0	26.5	25.11	25.15	25.02	25.02	25.25	25.18	25.19	25.29	25.18	25.01
9) PCD Ø	88.9	87.4	90.4	89.18	89.15	89.11	89.02	89.14	89.07	89.06	89.11	88.99	89.11
10) HOLE DIA Ø	19.05	18.85	19.25	19.20	19.07	19.10	19.19	19.20	19.06	19.14	19.24	19.19	
11) DEPTH OF SOCKET	13.00	13.00	13.50	13.01	13.08	13.18	13.08	13.03	13.13	13.20	13.17	13.04	13.00
12) RF HEIGHT	2.00	-	-	2.09	2.02	2.03	2.00	2.07	2.08	2.08	2.06	2.09	2.00
13) NO OF HOLE	4.00	-	-	OK									

IMPORTANT NOTE : ALL DIMENSIONS ARE IN MM
INSPECTED: VISUAL, DIMENSION & MARKING

AUTHORISED BY

Q.C. ENGG.





W.O.NO / P.O. NO. :-9107395

MATERIAL GRADE : ASTM A182 F304

ITEM GRADE : ASIM A182 F304L
ITEM DESCRIPTION :-1 NPS X CL 300 SWRF S40S (NACE)

SANGHVI FORGING & ENGG. LTD.
INSPECTION REPORT

SR NO. 31

DATE: 14/06/2021

13

IOT NO. SE 6710

UNSPECIFIED: VISUAL, DIMENSION & MARKING

Q.C. ENGG.


AUTHORISED BY



~~REVIEWED AND NOTED~~
...~~100%~~ WITNESSED