

Endurance Valve Products Ltd.

Packing Slip

Vendor Code: 421643

P.O. Box 3007
Sherwood Park, Alberta
T8H 2T1
Phone: 780.416.9683 Fax: 780.416.9684
GST# 81449 9752

DATE: June 3, 2022

PURCHASE ORDER # 3500008358

SHIP TO: Endurance Valve Products Ltd.
% Suncor Energy Oil Sands LP
OS FIREBAG
Via Hwy 63N of Fort McMurray
Firebag Site Alberta T9H 3E3
Ship to Code: AW03
PO# 3500008358

JUN 08 2022

LINE ITEM	DESCRIPTION	PART NUMBER	ORDER QUANTITY	SHIP QUANTITY
1	93SP-2140 10" Endurance Knife Gate Valve 150#	FV-10-300-150FF-TL-A36/TFE/ SS-17.4-BG-FB-X	1	1
2	93SP-2141 16" Endurance Knife Gate Valve 150#	FV-16-300-150FF-TL-A36/TFE/ SS-17.4-BG-FB-X	2	2
INSPECTED AT MCC (Authorized Personnel) NAME (mandatory) <u>D. A. 7. 8</u> ACCEPTED ☒ YES ☐ NO BADGE # <u>662437</u> DATE <u>June 9, 22</u> *Sched. QA, using QA Area Reliability & Qualified Whse Inspectors 4561				
TOTAL:			3	3
Freight Carrier: Canadian Freightways (Acct: #1137212)				
Freight Terms: FCA Longview, WA / Collect to Suncor Energy				

Co. Clk
JN 08/2022

Please Contact the Customer Service Department at 780.416.9683 with any questions or concerns

THANK YOU FOR YOUR BUSINESS!



ph: (780) 416-9683 fax: (780) 416-9684

www.endurancevalve.com

Documentation:

- Certificate of Compliance
- Hydrotest
- MTR's
- I.O.M's
- Endurance Stainless Steel Tag

Supplier:	Endurance Valve Products Ltd.
Vendor Code:	421643
Model:	FV-10-300-150FF-TL-A36/TFE/SS-17.4-BG-FB-X
Ref Job #	13782 Item #1
P.O.:	P.O. 4503127332
Serial #'s	219131-1

Tag #'s	93SP-2140
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Weight:	CRN: 0C10259.2 280 lbs
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ph: (780) 416-9683 fax: (780) 416-9684
www.endurancevalve.com

Certificate of Compliance

Customer: Endurance Valve Products

P.O. Box 3007
Sherwood Park, Alberta

Purchase Order Number: 13782 Item #1
Model Number: FV-10-300-150FF-TL-A36/TFE/SS-17.4-BG-FB-X
Serial #: 219131-1

Customer PO P.O. 4503127332

WE DO HEREBY CERTIFY THAT ALL MATERIALS AS IDENTIFIED IN THE ATTACHED DOCUMENTS ARE IN ACCORDANCE WITH THE SPECIFIED REQUIREMENTS OF THE PURCHASE ORDER

THE FOLLOWING DOCUMENTS ARE ATTACHED:

TEST REPORTS

MTR'S

I.O.M'S

T Black

Regards,
Endurance Valve

CRN-0C10259.2

280^{lbs}

219131-1

10"

Cast Valve Manufacturers ID: 2112913

FV-10-300-150FF-TL-A36/TFE/SS-17.4-BG-FB-X

P.O. 4503127332 / 3500008358

93SP-2140

13782

300^{CWP}

400°F

421643

A36

17.4^{ss}

RTFE



Testing Procedure and Process

Valve Description	FV-10-300-150FF-TL-A36/TFE/SS-17.4-BG-FB-X						
Serial Number	219131-1			Ref. #	13782	Size	10
Tag Number	93SP-2140			Design Pressure Body PSI/CWP		300	
Wetted Parts	17.4ss	Flange Material	A36	Design Pressure Seat PSI/CWP		300	
Seat Type	Resilient ☒	Bi-Direct ☒	Metal ☐	Other ☐			

BODY TEST

Using a calibrated pressure tester which is re-calibrated every 360 days, Valve shall be hydrostatically pressure tested at 1.5 times the rated working pressure with no visible leakage through the body material allowed. (Leakage through the packing or gate seal shall not be cause for rejection)

Test Pressure	450	PSI	Test Duration	10	Minutes
Results of Test	☒ PASS ☐ FAIL				
QC Inspector	<i>[Signature]</i>			Date	5-17-22

SEAT TEST

Apply test pressure to the closed gate at 40PSI (low pressure seat test) and then 1.1 times the rated pressure (high pressure test). Test shall be performed in both flow directions if applicable. Standard acceptance criteria for metal seats are a maximum leakage rate of 40cc/min/NPS (MSS-SP-81) and .167cc/min/NPS (MSS-SP-61) measured at 40PSI. Acceptance criteria for resilient seats are drip tight from 0 PSI to required test pressure. After test, the valve seat is dried with compressed air and wiped down with a dry towel. Leakage will be captured using a measurable catch vessel. *Note - Class IV Leakage Rates are based off of 0.01% Capacity.

Metal Seat Test	0	PSI	Leakage Side 1	N/A	Leakage Side 2	N/A
Resilient Seat Test	330	PSI	Leakage Side 1	☒	Leakage Side 2	☒
Test Duration	Side 1	2	Minutes	Side 2	2	Minutes
Test Results	Side 1	☒ PASS ☐ FAIL	Permissible Leakage			
Test Results	Side 2	☒ PASS ☐ FAIL	☐ Not Applicable 0.000			
Tester	<i>Nicholas Hicks</i>				Date	5-17-22

OPERATIONAL TEST

Open and close the valve 10 full cycles. The valve should open and close smoothly without binding. After the operational test visually inspect the body, gate, stem and operator to ensure it meets Customer and Factory specifications. The valve shall be considered acceptable if it operates smoothly through the entire cycle and meets Factory Quality Requirements.

(For additional functional testing use form QF-82-05-1 to document results.)

QC Inspector	<i>[Signature]</i>	Date	5-17-22
Source Inspector		Date	

QF-82-03-1

Hydrostatic Testing

Issued by: Engineering Effective Date: 4/25/2017 Rev. F

BRIDGE CITY STEEL
3/16 X 60.0000" X 120.0000"
HR CARBON STEEL PLATE-P15 ASTM-A-36
PART NO.

PO/REL 227256

/GEORGE KELLEY

Certificate of Mill Test Results

BL 20-749583-001

20DEC21
Pg 1/1

EVRAZ
Evraz Oregon Steel 1400 N. Rivergate Blvd, Portland, Oregon 97233

REPORT OF CHEMICAL/PHYSICAL TESTS

CENTROLINE NO. DATE PRICE 1785583 JUL 15, 2021 1	
INCL ORDER NO. DATE 365609	
CUSTOMER ORDER NO. 20-48581	
ORDER NO.	
SHIPPING NO. DATE 1785583 07/15/2021	
CARRIER GREEN TRANSPORT	
CARRIER NO. 1503	

THIS MATERIAL HAS BEEN MANUFACTURED, TESTED AND FOUND TO MEET THE SPECIFICATIONS AND PURCHASE ORDER REQUIREMENTS
CARBON STRUCTURAL QUALITY HOT ROLLED BAND TO MEET CHEMISTRY AND PHYSICALS OF
ASTM A36-15/ASME SA36 2019 ASTM A709-17 GRADE 36 [250]. KILLED FINE GRAIN
PRACTICE.

PHYSICAL PROPERTIES

ITEM	DESCRIPTION	HEAT NO.	SLAB	YIELD PSI X 100	TENSILE PSI X 100	% ELONG 8" 2"	% RA	HARDNESS BRIN TEST	IMPACTS
1	0.1875 X 60.0000" X 120.0000" .1830 MIN GAGE								
	1 PC 41740 LBS	RS4769		590	730	27		(OUTER)	
	1 PC 41740 LBS TOTALS			590	740	27		(OUTER)	

CHEMICAL ANALYSIS

HEAT NO.	C	Mn	P	S	SI	CU	NI	V	OB	AL	CR	MO	TI	B	N	CA	CE	REMARKS
HB4769	.05	.86	.010	.004	.28	.35	.11	.004	.023	.035	.12	.03						
REMARKS INDICATED WITH (+) WERE RECEIVED & ROLLED IN CANADA. REMARKS INDICATED WITH (+) WERE ROLLED IN THE USA.																		
END OF REPORT																		

I certify the above to be correct as contained in the records of EVRAZ INC. NA By

Chemist

BRIDGE CITY STEEL
(36) PLATE A36
5/16" X 96.0000" X 240.0000"
PART NO.

5116

A36

PO/Rel 227224

RS4757

Certificate of Mill Test Results

SO POR-046027-001

9Dec21

Pg 1/1

Attn:

EVRAZ

EVRAZ INC. NA

Evraz Oregon Steel 14400 N. Rivergate Blvd., Portland, Oregon 97203

REPORT OF CHEMICAL/PHYSICAL TESTS

ISO 9001 REGISTERED U.S. FLAG PRODUCED	SOLD TO	ORIGIN: PORTLAND FAX: 503-22- SON AVENUE -0086 US	ORIGIN: PORTLAND ENUE U-0086	CERTIFICATE NO. 1784132 DATE Jun 30, 2021 PAGE 1
				MILL ORDER NO. 365697 DATE
				CUSTOMER ORDER NO. POR-6802 JOINED NO.
				SHIPPING NO. 1784132 DATE 06/30/2021
				CARRIER GREEN TRANSFER CANTRICK NO. 906

THIS MATERIAL HAS BEEN MANUFACTURED, TESTED AND FOUND TO MEET THE SPECIFICATIONS AND PURCHASE ORDER REQUIREMENTS
CARBON STRUCTURAL QUALITY PLATE ASTM A36-19/ASME SA36 2019 ASTM A709-18 GRADE
36 NO WELD REPAIR. KILLED FINE GRAIN PRACTICE.

PHYSICAL PROPERTIES

ITEM	DESCRIPTION	HEAT NO.	SLAB	YIELD PSI X 100	TENSILE PSI X 100	% ELONG 8" 2"	% RA	HARDNESS BHN	BEND TEST	IMPACTS
2	0.3125 X 96.0000 X 240.000									
	2 PCS 4084 LBS	+1 RS4757		590 500	705 640	32 30				
	2 PCS 4084 LBS TOTALS									

CHEMICAL ANALYSIS

HEAT NO.	C	Mn	P	S	Si	Cu	Ni	V	Co	Al	Cr	Mo	Ti	B	N	Ca	CE	Micro EBM
+1 RS4757	.04	.85	.012	.006	.24	.35	.10	.003	.022	.044	.09	.03						
HEATS INDICATED WITH (!) WERE MELTED & POURED IN CANADA. HEATS INDICATED WITH (+) WERE ROLLED IN THE USA. END OF REPORT																		

I certify the above to be correct as contained in the records of EVRAZ INC. NA By _____

Chemist

Stuffer Sides

Shipper No 16415

Customer Name
Customer PO#
VARSTEEL LTD. - DELTA (INTERC)
DE-1089322

Horseshoe (Body) Packing Box Sides Stuffer Ends

IMR TEST LABS

A Curtiss-Wright Business Unit
www.imrportland.com

5687-A SE International Way

Portland, OR 97222

T: 1.503.653.2904 | F: 1.503.653.9591

Port Flanges (Body)

Top Flange

Gussets

Gland Flange

Yoke Top

Yoke Pads

TEST REPORT

IMR Report Number 202108560A

SUMMARY

One sample was received for mechanical testing.

The sample meets the specified tensile requirements for plates.

August 18, 2021

Rem Steel Sales, Inc
9109 N Wilbur
Portland, OR 97217

ROOM TEMPERATURE TENSILE TEST

PO Number
5725

Date Received
August 9, 2021

Material
3/4" Thick Steel Plate

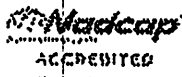
Material Identify
Heat# B1F775

Specification(s)
ASTM A36-19; and
ASTM A709-18, Gr. 36

Laboratory Number	Tensile Strength (ksi)	Yield Point (ksi)	Elongation in 2" (%)	Orig. Gauge Width (in.)
2108560-1FTT	68.0	44.9	36	0.507
ASTM A36-19 Req. (Range/Min.)	58 - 80	36	21	
ASTM A709-18, Gr. 36 Req. (Range/Min.)	58 - 80	36	21	

Direction = Transverse

Method(s): ASTM A370-20 and ASTM A6-19



Reviewed by

Chase Yurga-Bell
Technical Review

All procedures were performed in accordance with the IMR Quality Manual, current revision, and related procedures; and the P&W MCL Manual F-23 and related procedures as applicable. The information contained in this test report represents only the material tested and may not be reproduced, except in full, without the written approval of IMR Test Labs ("IMR"). IMR maintains a quality system in compliance with the ISO/IEC 17025 and is accredited by A2LA, certificate #114037. IMR will perform all testing in good faith using the proper procedures, trained personnel, and equipment to accomplish the testing required. Conformance will be based on results without measurement uncertainty applied, unless otherwise requested by the customer. IMR's liability to the customer or any third party is limited at all times to the amount charged for the services provided. All test samples will be retained for a minimum of 3 months and may be destroyed thereafter, unless otherwise specified by the customer. The recording of false, fictitious, or fraudulent statements or entries on this document may be punished as a felony under federal statutes. IMR Test Labs is a GEAE S-400 approved lab (Supplier Code T4260).

Rem Steel Sales, Inc

PMI

STATEMENT OF ANALYSIS

Page 1 Of 2

CONSIGNEE:

REM STEEL SALES INC.

9109 N WILBUR

DATE: 10 Jul 2021

BILL OF LADING NO: MR439044

MILL ORDER NO.(s) 41-647548 41-847548

PORTLAND, OR 97217

PRODUCT: PIPE _____ HSS _____

SHEET _____ X _____ PLATE _____ COIL _____

THE ANALYSIS OF THE PRODUCT ON THIS LOAD IS AS FOLLOWS:

SIZE				GRADE			HEAT NO.						
ELEMENT - ALLOY THRESHOLD													
%C	%Mn	%B	%Ti	%Si	%Cu	%Ni	%Cr	%P	%S	%V	%CB	%Mo	%AL
---	1.65	.0008	0.05	0.60	0.40	0.30	0.30	---	---	0.10	0.06	0.08	0.30
0.000 X 0 X				SECONDS			US		B1F734 E01				
0.17	1.01	.0002	0.007	0.14	0.36	0.19	0.18	0.015	0.003	0.032	0.002	0.03	0.036
0.000 X 0 X				SECONDS			US		B1F734 E01				
0.17	1.01	.0002	0.007	0.14	0.36	0.19	0.18	0.015	0.003	0.032	0.002	0.03	0.036
0.000 X 0 X				SECONDS			US		A1F338 C34				
0.17	1.06	.0001	0.007	0.03	0.28	0.12	0.15	0.011	0.005	0.034	0.001	0.03	0.034
0.000 X 0 X				SECONDS			US		A1F338 C34				
0.17	1.06	.0001	0.007	0.03	0.28	0.12	0.15	0.011	0.005	0.034	0.001	0.03	0.034
0.000 X 0 X				SECONDS			US		B1F739 E59				
0.17	1.04	.0001	0.008	0.12	0.37	0.20	0.15	0.013	0.002	0.031	0.002	0.03	0.037
0.000 X 0 X				SECONDS			US		B1F739 E59				
0.17	1.04	.0001	0.008	0.12	0.37	0.20	0.15	0.013	0.002	0.031	0.002	0.03	0.037
0.000 X 0 X				SECONDS			US		A1F288 C43				
0.20	0.52	.0001	0.006	0.04	0.29	0.15	0.16	0.007	0.004	0.003	0.000	0.04	0.030
0.000 X 0 X				SECONDS			US		B1F776 C39				
0.20	0.52	.0001	0.007	0.08	0.27	0.12	0.18	0.011	0.001	0.003	0.001	0.03	0.033

We trust this is the information you require.
Very truly yours,

SSAB IOWA INC.

Shipping

Export Declaration Exempt: NOEEI 30.36

PMI

STATEMENT OF ANALYSIS

Page 2 Of 2

CONSIGNEE:

REM STEEL SALES INC.

9109 N WILBUR

DATE: 10 Jul 2021

BILL OF LADING NO.: MR439044

MILL ORDER NO.(s) 41-647548 41-647548

PORTLAND, OR 97217

PRODUCT: PIPE _____ HSS _____

SHEET X PLATE _____ COIL _____

THE ANALYSIS OF THE PRODUCT ON THIS LOAD IS AS FOLLOWS:

SIZE				GRADE			HEAT NO.						
ELEMENT - ALLOY THRESHOLD													
%C	%Mn	%B	%Ti	%Si	%Cu	%Ni	%Cr	%P	%S	%V	%Cb	%Mo	%Al
---	1.65	.0008	0.05	0.60	0.40	0.30	0.30	---	---	0.10	0.06	0.08	0.30
0.000 X 0 X				SECONDS			US		B1F776 C39				
0.20	0.52	.0001	0.007	0.08	0.27	0.12	0.18	0.011	0.001	0.003	0.001	0.03	0.033
0.000 X 0 X				SECONDS			US		B1F776 C39				
0.20	0.52	.0001	0.007	0.08	0.27	0.12	0.18	0.011	0.001	0.003	0.001	0.03	0.033
0.000 X 0 X				SECONDS			US		B1F775 C39				
0.20	0.52	.0001	0.007	0.08	0.27	0.12	0.18	0.011	0.001	0.003	0.001	0.03	0.033
0.000 X 0 X				SECONDS			US		B1F775 C39				
0.20	0.52	.0001	0.007	0.08	0.27	0.12	0.18	0.011	0.001	0.003	0.001	0.03	0.033
0.000 X 0 X				SECONDS			US		B1F775 C39				
0.20	0.52	.0001	0.007	0.08	0.27	0.12	0.18	0.011	0.001	0.003	0.001	0.03	0.033
0.000 X 0 X				SECONDS			US		B1F775 C39				
0.20	0.52	.0001	0.007	0.08	0.27	0.12	0.18	0.011	0.001	0.003	0.001	0.03	0.033
0.000 X 0 X				SECONDS			US		A1F239 C03				
0.16	1.34	.0002	0.009	0.16	0.33	0.20	0.18	0.010	0.001	0.008	0.002	0.03	0.025

We trust this is the information you require.

Very truly yours,

SSAB IOWA INC.

Shipping

Export Declaration Exempt: NOEEI 30.36

0-1 5705

SR
STATE PLATE

CERTIFICATE NO.	DATE	PAGE
1804894	Dec 13, 2021	11
MAIL ORDER NO.	DATE	
136736		
CUSTOMER ORDER NO.		
JOBREQ. NO.		
SHIPPING NO.	DATE	
1804894	12/13/2021	
CARRIER		
UNKNOWN		
CAR/TRUCK NO.		
P17316-STA		

PHYSICAL PROPERTIES

ITEM NO	DESCRIPTION	HEAT NO.	SLAB	YIELD PSI X 100	TENSILE PSI X 100	% ELONG 8" 2"	% RA	HARDNESS BHN	BEND TEST	IMPACTS
2	HSLA STRUCTURAL QUALITY PLATE ASTM A572-21 GRADE 50 ASME SA572 GRADE 50 2021 ASTM A709-18 GRADE 50 0.7480 X 94.920M X 415.250 1 PC 8361 LBS +# RS5688			605	800	45				Port Flanges (Body) Top Flange Gussets Gland Flange Yoke Top Yoke Pads

CHEMICAL ANALYSIS

[illegible]

I certify the above to be correct as contained in the records of EVRAZ INC. NA By _____

Chemist

Certificate of Mill Test Results

BRIDGE CITY STEEL INC.
STAINLESS PLATE SPL 1/4" x 60" x 120" HRAP ASTM A-240 304L

PO/Rel: 227297

Inv: 1087559 Date: 01/05/2022
Heat: N82C



NORTH AMERICAN
STAINLESS

METALLURGICAL TEST REPORT

6870 Highway 42 East
Chenit, KY 41045-9615
(502) 347-6000

Certificate: 725477 01 Mail To:
Customer: 3585 046 WEST COAST METALS
C/O PRO-COIL
11919 SMITH AVE.
SANTA FE SPRINGS, CA 90670

Ship To:
WEST COAST METALS
C/O PRO-COIL
11919 SMITH AVE.
SANTA FE SPRINGS, CA 90670

Date: 9/24/2021 Page: 1
Steel: 304/304L
Finish: HBAP

Your Order: F039822 NAS Order: AN 0954386 04 Corrosion: ASTM A262/15, 1808end-OK

PRODUCT DESCRIPTION:

STAINLESS STEEL COIL, HRAP; UNS 30400/30403
ASTM A240/20a, A480/20a, A666/15; ASME SA240/19, SA666/19
CHEM ONLY ON FOLLOWING ASTM: A276/17, A479/20, A484/20b, A312/21
CHEM ONLY ON FOLLOWING ASME: SA312/19, SA479/19
AMS 5511K/5513J IMPR; MIL-8-5055D AMS (X CRN MEAS); MIL-4043B
NACE MR0175/ISO 15156-3:2015 A, MR0103/07; QCS766D-A X ERG PERM
MIN. SOLUTION ANNEAL TEMP 1900F, WATER QUENCHED

REMARKS:

Mat'l is Free of Mercury Contamination. No weld repairs.
EN 10204:2004 3.1; RoHS 1, 2 & 3 Compliant
Material is Free of Radioactive Contamination
Steel Making Process: EAF, AOD, & Cont. Casting
Product Mfg. by a Quality Mgt. Sys. in Conf. w/ISO 9001
*Melted & Manufactured in the USA; Mat'l is DEARS Compliant

Product ID #	Coil #	Thickness	Width	Weight	Length	Mark	Pieces
04N82C E	* 04N82C E	.2500	50.0000	20.610	COIL	399.60	6

CHEMICAL ANALYSIS CM(Country of Melt) ES(Spain) US(Unified States) ZA(South Africa) JP(Japan) A2323
ANAB, ISO/IEC 17025, Certificate# A2323
Chemical Analysis per ASTM A751/20

HEAT	CM	C %	CR %	CU %	EN %	MO %	N %	NI %	P %	S %
N82C	US	.0200	18.0500	.3630	1.8445	.2890	.0816	8.0810	.0270	.0010
SI %										

MECHANICAL PROPERTIES

Product ID #	Coil #	UTS	20C	20C	YS	20C	ELONG	%	Hard	Tail
04N82C E	04N82C E	F T	94.22	51.44	52.79	90.50	89.50			

NAS hereby certifies that the analysis on this certification is correct. Based upon the results and the accuracy of the test methods used, the material meets the specifications stated. These results relate only to the items tested and this report cannot be reproduced, except in its entirety, without the written approval of NAS.

Technical
Dept. Mgr.

KRIS LARK

9/27/2021

083842

PO 13782 Item #1
10" FV-150 T-Lok
Gate PMI

INTERNATIONAL INSPECTION

PMI Procedure: II-54 Rev.6
PMI Instrument: Thermo Scientific Niton XL2 980
Instrument S/N# 112678
Tech: D. Rosian

S/N: 219131-1

Reading No.	Time	Type	Duration	Units	Sequence	Item Description	Material ID	Ni	N Error	Cr	Cr Error	Results
1	4/28/2022 6:58	System Check	53.55	cps	Final	System Check 1 of 2						Pass
2	4/28/2022 6:59	System Check	54.21	cps	Final	System Check 2 of 2						Pass
3	4/28/2022 7:00	General Metals	10	%	Final	IARM 35NN Calibration Standard	1.25Cr(P11) : 0.75	0.14	0.044	1.092	0.046	Pass
4	4/28/2022 7:09	General Metals	10	%	Final	Job# 951-2 - 28" UNI (1 of 1)	SS-304 : 1.29	7.97	0.177	17.934	0.158	Pass
6	4/28/2022 7:11	General Metals	10	%	Final	Job# 974-1 - 12" UNI (1 of 1)	SS-304 : 0.34	8.381	0.181	18.035	0.159	Pass
7	4/28/2022 7:12	General Metals	10	%	Final	Job# 913-1 - 10" TLOK (1 of 1)	17-4 PH : *2.21	4.675	0.152	15.656	0.156	Pass
10	4/28/2022 7:21	General Metals	10	%	Final	Job# 911-1 - 4" UNI-Wear Ring (1 of 7)	SS-304 : 0.00	8.006	0.182	18.549	0.165	Pass
13	4/28/2022 7:25	General Metals	10	%	Final	Job# 911-1 - 4" UNI-Wear Ring (2 of 7)	SS-304 : 0.02	8.118	0.177	18.471	0.16	Pass
14	4/28/2022 7:26	General Metals	10	%	Final	Job# 911-1 - 4" UNI-Wear Ring (3 of 7)	SS-304 : 0.54	8.063	0.179	18.601	0.162	Pass
15	4/28/2022 7:27	General Metals	10	%	Final	Job# 911-1 - 4" UNI-Wear Ring (4 of 7)	SS-304 : 0.50	7.886	0.177	18.49	0.162	Pass
16	4/28/2022 7:28	General Metals	10	%	Final	Job# 911-1 - 4" UNI-Wear Ring (5 of 7)	SS-304 : 0.40	8.008	0.185	18.5	0.168	Pass
17	4/28/2022 7:29	General Metals	10	%	Final	Job# 911-1 - 4" UNI-Wear Ring (6 of 7)	SS-304 : 0.39	8.036	0.179	18.67	0.163	Pass
18	4/28/2022 7:34	General Metals	10	%	Final	Job# 911-1 - 4" UNI-Wear Ring (7 of 7)	SS-304 : 0.60	7.945	0.172	18.67	0.157	Pass
19	4/28/2022 7:38	General Metals	10	%	Final	Job# 820-1 - 42" TLOK (1 of 2)	SS-304 : 0.80	7.978	0.177	18.221	0.16	Pass
20	4/28/2022 7:42	General Metals	10	%	Final	Job# 820-1 - 42" TLOK (2 of 2)	SS-304 : 0.71	7.971	0.178	18.101	0.16	Pass
21	4/28/2022 7:45	General Metals	10	%	Final	IARM 35NN Calibration Standard	1.25Cr(P11) : 0.75	0.145	0.044	1.072	0.046	Pass

304L Composition Range (ASME Sec.II)

Chromium (Cr): 18.0 - 20.0

Nickel (Ni): 8.0 - 13.0

17-4PH Composition Range

Chromium (Cr): 15.0 - 17.5

Nickel (Ni): 3.0 - 5.0

Technician: Daniel C Rosian 4/28/2022

D. Rosian

ARMI MBH

ANALYTICAL LTD

ISO Certified - 9001 - 17025 - 17043 - 17034

Certificate of Analysis

IARM 35NN

Low Alloy Steel / F11 / 1%Cr 1/2Mo / UNS K11572

Certified Reference Material

Values listed in wt.% with estimated uncertainties

Al	0.0134 ± 0.0005	As	0.0047 ± 0.0002	B	0.0003 ± 0.0001	Ca	0.0010 ± 0.0001
Co	0.0089 ± 0.0002	Cr	1.086 ± 0.001	Cu	0.174 ± 0.001	Fe*	97.22 ± 0.01
Mn	0.331 ± 0.001	Mo	0.478 ± 0.002	Nb	0.0017 ± 0.0001	Ni	0.125 ± 0.001
P	0.0063 ± 0.0001	Pb	0.0022 ± 0.0001	S	0.0038 ± 0.0005	Sb	0.0025 ± 0.0001
Si	0.559 ± 0.004	Sn	0.0087 ± 0.0001	Ta	0.0012 ± 0.0001	Ti	0.0019 ± 0.0001
V	0.0056 ± 0.0001	W	0.0035 ± 0.0001				



*Iron has been calculated as a balance element and was not directly measured by WD-XRF

Description and Intended Use

This Certified Reference Material comes in the form of a solid metal disk approximately 3mm thick by 38mm diameter. The intended use of this certified reference material may include, but is not limited to, the calibration of instruments and the validation of analytical methods. Independent evaluation for the intended use of this material should be conducted by the user.

Instructions for Use

1. The test surface is on the opposite side of the labeled surface, which includes the material identification. The entire thickness of the unit is certified. However, the user is cautioned not to measure disks less than 2 mm thick when using X-ray fluorescence spectrometry. Each packaged disk has been prepared by finishing the test surface using a lathe. The user must determine the correct surface preparation procedure for each analytical technique. The user is cautioned to use care when either resurfacing the disk or performing additional polishing, as these processes may contaminate the surface.
2. The material should be stored in a cool, dry location when not in use.

Analytical Reference Materials International • 276 Abby Road • Manchester, NH 03103
Telephone (603) 935-4100 • Fax (603) 935-4101 • www.ARMi.com • ARMI@LGCgroup.com

IARM-35NN-F
6/30/2020 1/2



ph: (780) 416-9683 fax: (780) 416-9684
www.endurancevalve.com

INSTALLATION & MAINTENANCE

Valve: 150# TLOK

Flange Bolting: See bolt/torque chart

DESCRIPTION:

The FV-150 T-LOK is a fabricated knife-gate valve. It has two body liners and a seat all made of Teflon or UHMW. It is a bi-directional flow valve and can be installed inline facing either direction. Multiple rows of packing are used to seal the gate outside the flow area. The pressure rating of the FV-150 T-LOK is 150# - 150 CWP (cold working pressure). The Manufacturer will provide test reports with shipment

SHIPPING & STORAGE:

All valves are normally shipped in the "closed" position. Small valves (2" – 6") may be packaged in individual boxes. Larger valves and large quantities will be packaged on pallets, skids, or in boxes and will require a forklift, or appropriate machine, for moving. Storage should be a clean dry environment, such as a warehouse.

INSTALLATION:

Install the valve to the mating pipe flange using proper fastener size and length. Thread size will be provided with each valve. If fasteners are not included in the ordered shipment, customer/installer will need to obtain proper fasteners themselves and must measure the valve and flanges to ensure correct length. Studs and nuts should be used when possible to make fitting easier. Be careful not to bottom-out fasteners in the chest during installation as that area is usually a pressure boundary and can be adversely affected if stress is applied from fasteners. Washers should be used to help shorten the penetration of bolts in the chest holes when needed. (Reference Flange Installation Instructions)

Torque charts can be referenced for the mating flange fasteners in the installation process but will vary according to gasket type, size, and thickness used. Use the cross-torque pattern method for tightening the fasteners. Mating flanges must be parallel and true with each other and the valve. Do not use the valve to pull together or push apart the two mating pipes. After installation, open and close the valve to assure smooth operation.



ph: (780) 416-9683 fax: (780) 416-9684
www.endurancevalve.com

MAINTENANCE:

The only item requiring maintenance/adjustment on the knife-gate valve is the packing. After shipment and installation, the packing gland may require adjustment to stop any leaks, especially if the valve has been in storage for a long period of time. When adjusting the packing gland fasteners, it is best to move along both sides of the gland to ensure even adjustment. To stop a leak, normally just a small amount of tightening per fastener is required. Do not tighten fasteners more than is necessary to stop the leak.

Valve Size	Bolt Size	Torque FT. lbs.
2"-4"	5/8"-11 UNC	55 (+/-5)
6"-8"	3/4"-10 UNC	65 (+/-5)
10"-12"	7/8"-9 UNC	110 (+/-10)
14"-16"	1"-8 UNC	135 (+/-10)
18"-20"	1-1/8"-8 UNC	150 (+/-10)
24"-30"	1-1/4"-8 UNC	200 (+/-10)
32"-48"	1-1/2"-8 UNC	250 (+/-10)

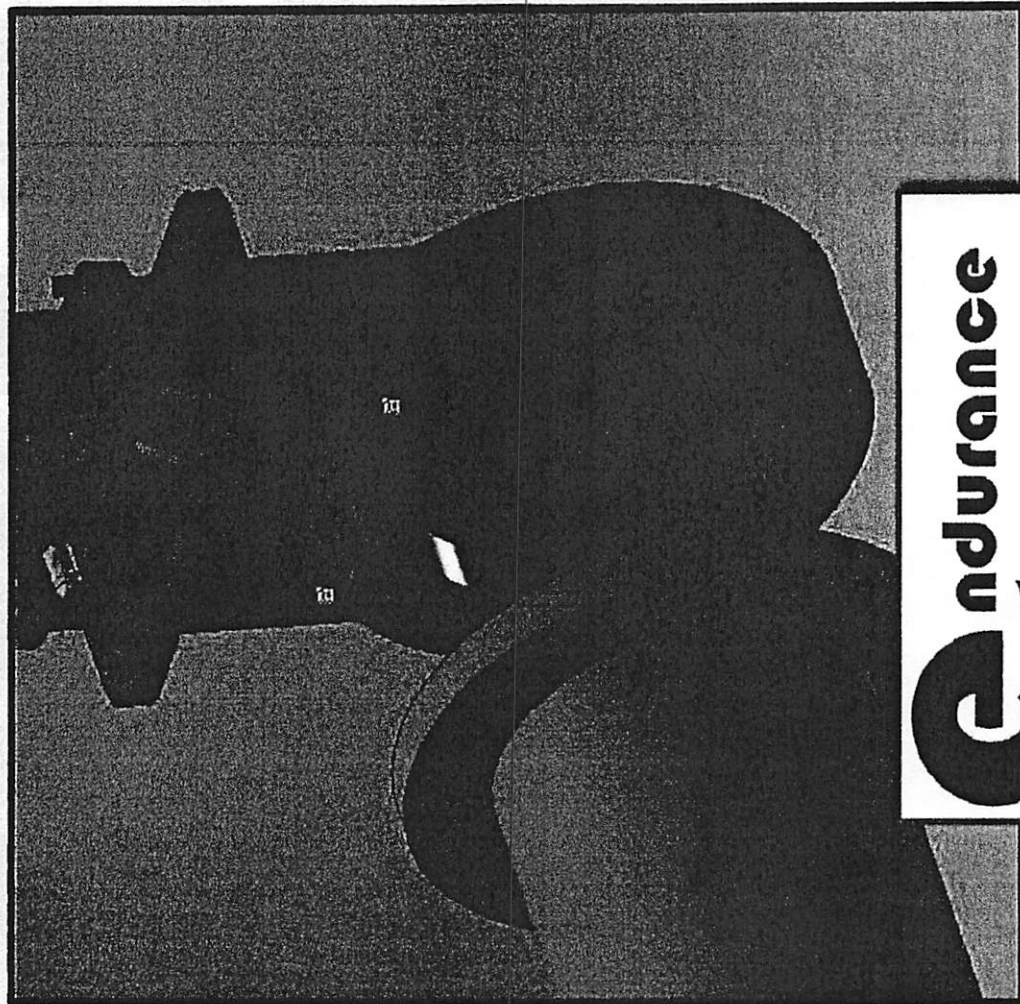
BOLTING STUDS TO VALVE-PIPING

Engineering



STEP 1

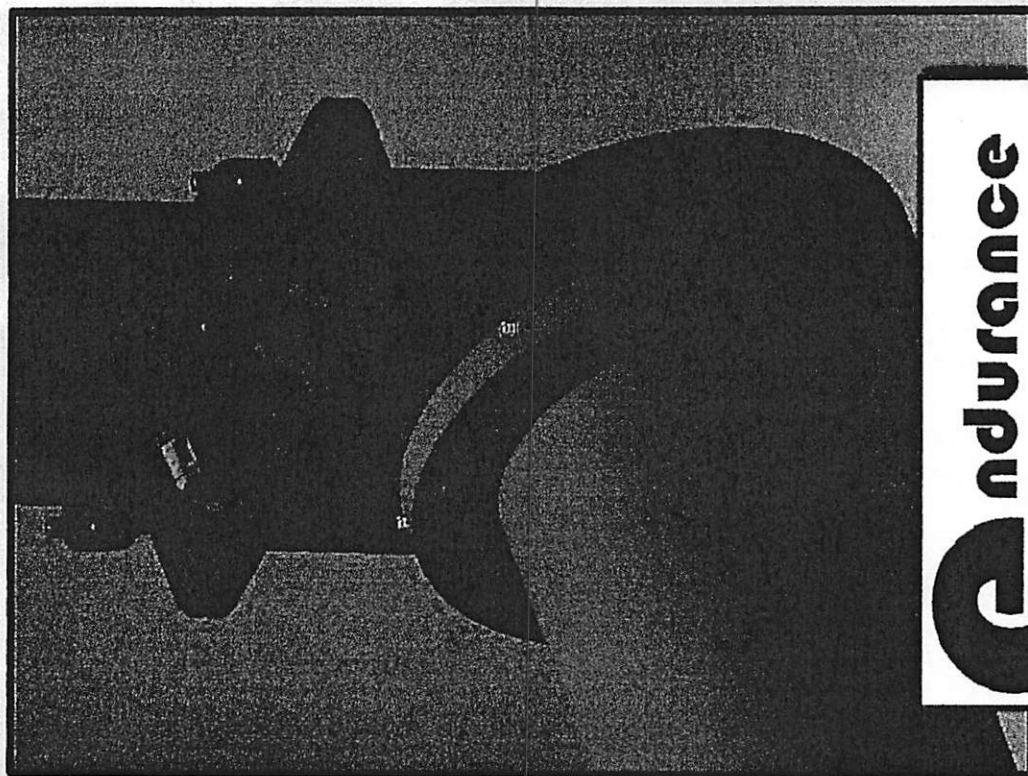
- Begin with 2 studs threaded into the valve next to each other



Endurance
7 **valve**

STEP 2

- Line-up to piping and slide flush to pipe and hand snug nuts w/washer



Endurance
Galve

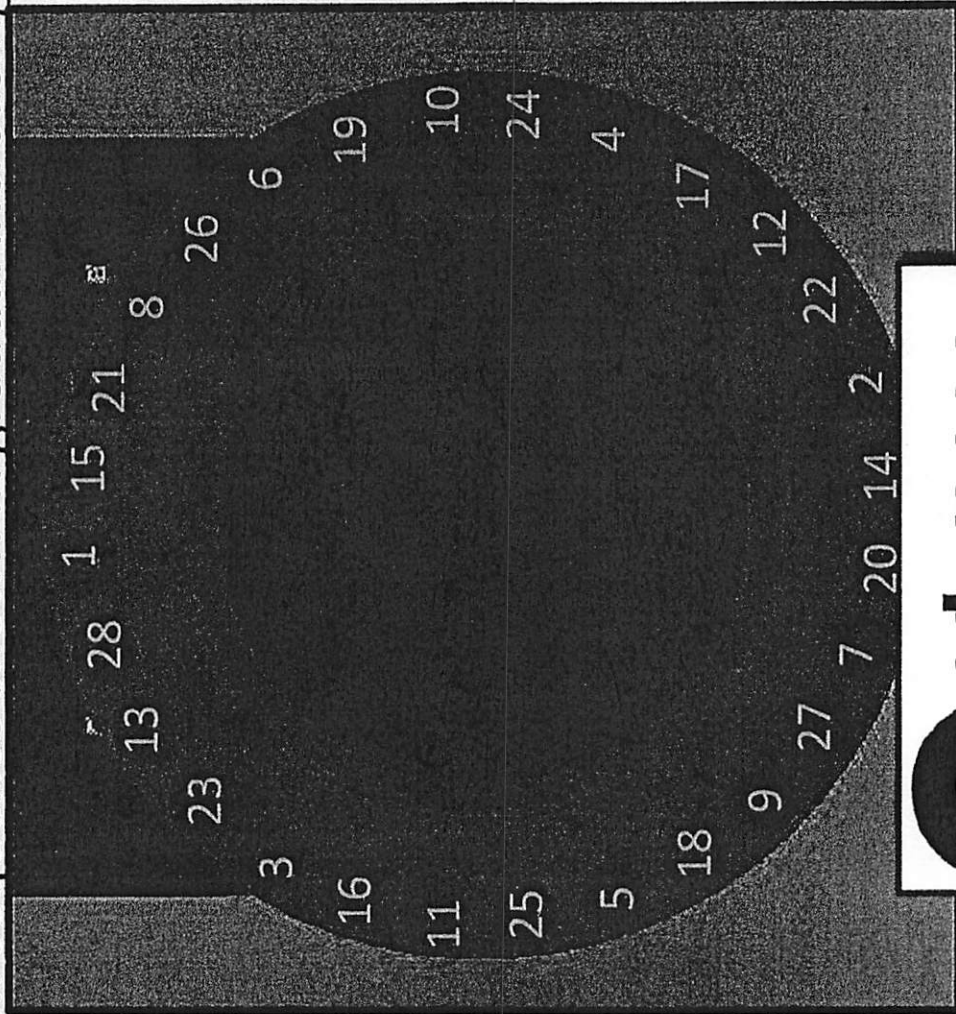
STEP 3

- Thread a nut $\frac{3}{4}$ of the way down another stud.
- Thread a 2nd nut down to the 1st nut.
- Place a washer on the longest side of the stud
- Thread stud by hand into the valve snug and remove upper nut
- Loosen nut and thread remaining stud into valve



STEP 4

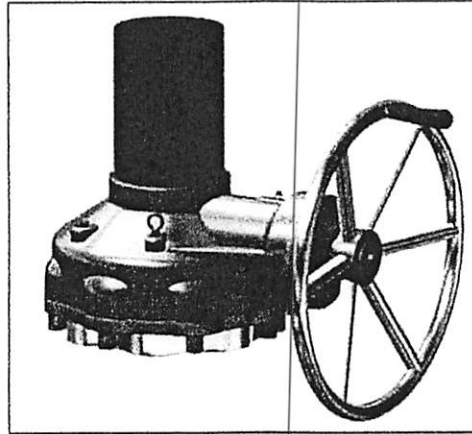
- Thread remaining studs and nuts into valve hand snug
- Then torque* in sequence shown in gradual increasing torque.



Endurance
Valve

*torque sequence changes per valve size

SAMBO INDUSTRIAL BEVEL GEAR OPERATORS



BEVEL GEAR BOX

* MATERIAL & FEATURE

1) MATERIAL

HOUSING	Ductile Iron or WCB
BASE	Ductile Iron or WCB
END CAP	Ductile Iron or WCB
PINION	SCM440
BEVEL GEAR	SCM4
DRIVE SLEEVE	A105
STEM CAP	A36
LOCK NUT	A105

2) FEATURE

We have two kinds of manual bevel gear operator type, one is bevel gear and the other is be helical gear. The latter was bevel-spur gear. It has been changed helical gear, because of so rotating among the spur gears.

GENERAL TYPE ----- SB-VS10 SB-V8 (USED BEVEL GEAR)

SUPPORT BOX TYPE-1 - SB-V3-1 SB-V8-1 (USED BEVEL- HELICAL GEAR)

SUPPORT BOX TYPE-2 - SBV2-20 SBV8-20 (USED BEVEL- BEVEL GEAR)

SUPPORT BOX TYPE-3 - SBV2-20-1 SBV8-20-1 (USED BEVEL- BEVEL-BEVEL GEAR)

INSTALLATION

1) Mounting to valve

If the bevel gear operator has been supplied with a hand-wheel, it is recommended that it is fitted to the gearbox before mounting on the valves. About that, be careful the P.C. and tap size of gear box base.

2) Maintenance

Under normal operating conditions no maintenance is required for the bevel gear operator but should the valve be taken out of service for overhaul, the bevel gear operator baseplate may be removed and the grease changed using one of the following recommended lubricants.

Manufacturer : Yong Kang CO.,LTD

Name : Grease(GRANT SUPER GREASE)

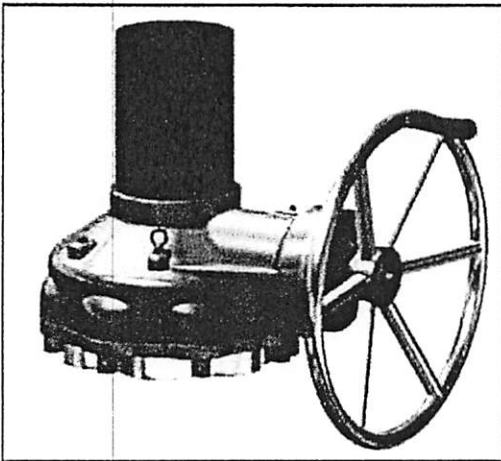
Temperature Range : -4°F □ 284°F (-20°C □ +140°C)

DEVICE OF OPERATION

1) **HAND WHEEL** : Hand-wheel can be located in quadrant, giving you good adaptability. You can install very easily, attach the wheel to the pinion, and a nut and screw.

2) **ACTUATOR** : If you would like to increase RPM, you may use an actuator.

3) **CHAIN WHEEL** : Overhead or inaccessible valves, when equipped with this device may be conveniently and safely operated from the floor.

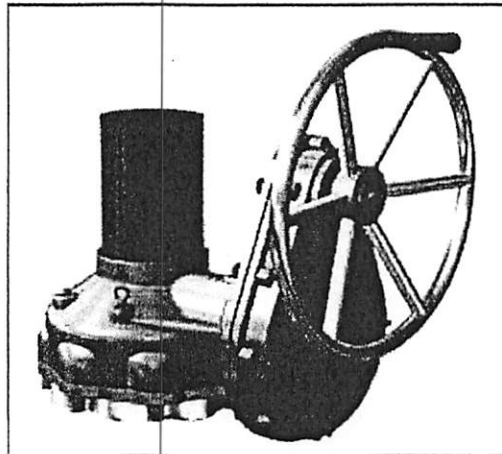


GENERAL TYPE-HORIZONTAL
TYPE-1 Stair

Specifications

- SB-VS10~SB-VS20
- SB-V0~SB-V2
- SB-V3~SB-V5

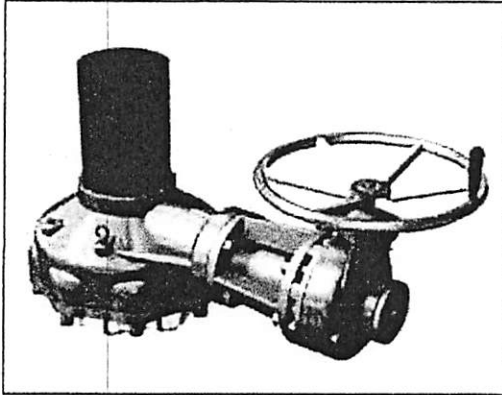
- SB-V6~SB-V8



SUPPORT BOX TYPE HORIZONTAL
TYPE - 2 Stairs

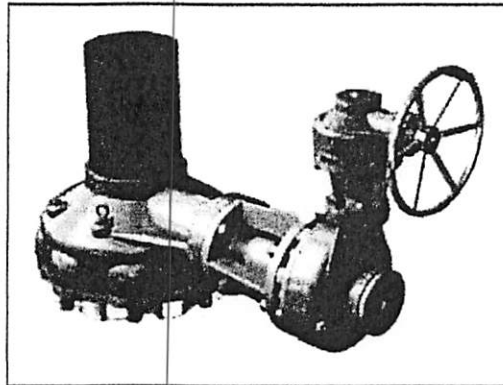
Specifications

- SB-V3-1~SB-V6-1
- SB-V7-1~SB-V8-1



SUPPORT BOX TYPE VERTICAL
TYPE - 2 Stairs

Specifications
- SBV2-20~SBV8~20



SUPPORT BOX TYPE HORIZZONTAL
TYPE - 3 Stairs

Specifications
SBV2~20-1~SBV8~20-1



ph: (780) 416-9683 fax: (780) 416-9684

www.endurancevalve.com

Documentation:

- Certificate of Compliance
- Hydrotest
- MTR's
- I.O.M's
- Endurance Stainless Steel Tag

Supplier:	Endurance Valve Products Ltd.	
Vendor Code:	421643	
Model:	FV-16-300-150FF-TL-A36/TFE/SS-17.4-BG-FB-X	
Ref Job #	13782 Item #2	
P.O.:	P.O. 4503127332	
Serial #'s	229132-1	229132-2
Tag #'s	93SP-2141	93SP-2141
Weight:	CRN: 0C10259.2 1,100 lbs	



ph: (780) 416-9683 fax: (780) 416-9684
www.endurancevalve.com

Certificate of Compliance

Customer: Endurance Valve Products

P.O. Box 3007

Sherwood Park, Alberta

Purchase Order Number: 13782 Item #2

Model Number:

FV-16-300-150FF-TL-A36/TFE/SS-17.4-BG-FB-X

Serial #:

229132-1

229132-2

Customer PO

P.O. 4503127332

WE DO HEREBY CERTIFY THAT ALL MATERIALS AS IDENTIFIED IN THE ATTACHED DOCUMENTS ARE IN ACCORDANCE WITH THE SPECIFIED REQUIREMENTS OF THE PURCHASE ORDER

THE FOLLOWING DOCUMENTS ARE ATTACHED:

TEST REPORTS

MTR'S

I.O.M'S

T Black

Regards,
Endurance Valve

CRN-OC10259.2

1,100^{LB}

Fabricast Valve Manufacturers ID: 2112913

219132-1

16"

FV-16-300-150FF-TL-A36/TFE/SS-17.4-BG-FB-X

P.O. 4503127332 / 3500008358

93SP-2141

13782

300^{CWP}

400°F

421643

A36

17.4^{ss}

RTFE

CRN-0010259.2

1,100^{lbs}

abricast Valve Manufacturers ID: 2112913

219132-2

16"

FV-16-300-150FF-TL-A36/TFE/SS-17.4-BG-FB-X

P.O. 4503127332 / 3500008358

93SP-2141

13782

300^{CWP}

400°F

421643

A36

17.4^{ss}

RTFE



Testing Procedure and Process

Valve Description	FV-16-300-150FF-TL-A36/TFE/SS-17.4-BG-FB-X						
Serial Number	229132-1			Ref. #	13782	Size	16
Tag Number	93SP-2141			Design Pressure Body PSI/CWP		300	
Wetted Parts	17.4ss	Flange Material	A36	Design Pressure Seat PSI/CWP		300	
Seat Type	Resilient ☒	Bi-Direct ☒	Metal ☐	Other ☐			

BODY TEST

Using a calibrated pressure tester which is re-calibrated every 360 days, Valve shall be hydrostatically pressure tested at 1.5 times the rated working pressure with no visible leakage through the body material allowed. (Leakage through the packing or gate seal shall not be cause for rejection)

Test Pressure	450	PSI	Test Duration	10	Minutes
Results of Test	☒ PASS ☐ FAIL				
QC Inspector	[Signature]			Date	6/3/22

SEAT TEST

Apply test pressure to the closed gate at 40PSI (low pressure seat test) and then 1.1. times the rated pressure (high pressure test). Test shall be performed in both flow directions if applicable. Standard acceptance criteria for metal seats are a maximum leakage rate of 40cc/min/NPS (MSS-SP-81) and .167cc/min/NPS (MSS-SP-61) measured at 40PSI. Acceptance criteria for resilient seats are drip tight from 0 PSI to required test pressure. After test, the valve seat is dried with compressed air and wiped down with a dry towel. Leakage will be captured using a measurable catch vessel. *Note - Class IV Leakage Rates are based off of 0.01% Capacity.

Metal Seat Test	0	PSI	Leakage Side 1	N/A	Leakage Side 2	N/A
Resilient Seat Test	330	PSI	Leakage Side 1	0	Leakage Side 2	0
Test Duration	Side 1	2	Minutes	Side 2	2	Minutes
Test Results	Side 1	☒ PASS ☐ FAIL	Permissible Leakage			
Test Results	Side 2	☒ PASS ☐ FAIL	0.000			
Tester	[Signature]				Date	6/3/22

OPERATIONAL TEST

Open and close the valve 10 full cycles. The valve should open and close smoothly without binding. After the operational test visually inspect the body, gate, stem and operator to ensure it meets Customer and Factory specifications. The valve shall be considered acceptable if it operates smoothly through the entire cycle and meets Factory Quality Requirements.

(For additional functional testing use form QF-82-05-1 to document results.)

QC Inspector	[Signature]	Date	6/3/22
Source Inspector		Date	

QF-82-03-1

Hydrostatic Testing

Issued by: Engineering	Effective Date: 4/25/2017	Rev. F
------------------------	---------------------------	--------



Testing Procedure and Process

Valve Description	FV-16-300-150FF-TL-A36/TFE/SS-17.4-BG-FB-X				
Serial Number	229132-2	Ref. #	13782	Size	16
Tag Number	93SP-2141	Design Pressure Body PSI/CWP	300		
Wetted Parts	17.4ss	Flange Material	A36	Design Pressure Seat PSI/CWP	300
Seat Type	Resilient ☒	Bi-Direct ☒	Metal ☐	Other ☐	

BODY TEST

Using a calibrated pressure tester which is re-calibrated every 360 days, Valve shall be hydrostatically pressure tested at 1.5 times the rated working pressure with no visible leakage through the body material allowed. (Leakage through the packing or gate seal shall not be cause for rejection)

Test Pressure	450	PSI	Test Duration	10	Minutes
Results of Test	☒ PASS	☐ FAIL			
QC Inspector	<i>[Signature]</i> (91)			Date	6/3/22

SEAT TEST

Apply test pressure to the closed gate at 40PSI (low pressure seat test) and then 1.1 times the rated pressure (high pressure test). Test shall be performed in both flow directions if applicable. Standard acceptance criteria for metal seats are a maximum leakage rate of 40cc/min/NPS (MSS-SP-81) and .167cc/min/NPS (MSS-SP-61) measured at 40PSI. Acceptance criteria for resilient seats are drip tight from 0 PSI to required test pressure. After test, the valve seat is dried with compressed air and wiped down with a dry towel. Leakage will be captured using a measurable catch vessel. *Note - Class IV Leakage Rates are based off of 0.01% Capacity.

Metal Seat Test	0	PSI	Leakage Side 1	N/A	Leakage Side 2	N/A
Resilient Seat Test	330	PSI	Leakage Side 1	<i>[Signature]</i>	Leakage Side 2	<i>[Signature]</i>
Test Duration	Side 1	2	Minutes	Side 2	2	Minutes
Test Results	Side 1	☒ PASS	☐ FAIL	Permissible Leakage		
Test Results	Side 2	☒ PASS	☐ FAIL	☐ Not Applicable	0.000	
Tester	<i>Lyman Arefander</i>			Date	6/3/22	

OPERATIONAL TEST

Open and close the valve 10 full cycles. The valve should open and close smoothly without binding. After the operational test visually inspect the body, gate, stem and operator to ensure it meets Customer and Factory specifications. The valve shall be considered acceptable if it operates smoothly through the entire cycle and meets Factory Quality Requirements.

(For additional functional testing use form QF-82-05-1 to document results.)

QC Inspector	<i>[Signature]</i> (91)	Date	6/3/22
Source Inspector		Date	

QF-82-03-1	Hydrostatic Testing
Issued by: Engineering	Effective Date: 4/25/2017 Rev. F

3/16 A36

540798

EVRAZ

EVRAZ INC. NA

Test Certificate

P.O. Box 1670, Regina, Saskatchewan, Canada S4P 3C7

Form TCI: Revision 2: Date 13 Feb 2017

Warehouse Transfer

From Delta Varsteel to Corporate C

Customer Name

VARSTEEL LTD. - DELTA (INTERC) DE-1072731

Customer PO#Transfer No Heat Number

233606 540798

Shipper No Heat Number

17288 540798

Customer: VARSTEEL LTD. 330-220 4TH STREET LETHBRIDGE AB T1J4J7			Customer P.O. No.: DCTL-863			Mill Order No.: 41-258721-04			Shipping Manifest: RT127215																																										
Product Description: CSA G40.21(2016)44/300/38W:ASTM A36(19) A709(01A)36/ASME SA36(01ED) CSA G40.21(2016)300W/260W			Ship Date: 04 Nov 21			Cert No: 071111472			(Page 1 of 1)																																										
			Cert Date: 04 Nov 21																																																
Size (Min): 0.178 X 60.00 X COIL (IN)																																																			
Tested Pieces			Tensiles			Charpy Impact Tests																																													
Heat Id	Piece Id	Piece Dimensions	Tst Loc	YS (PSI)	UTS (PSI)	%RA	Elong % 2in	%Tst 8in	Average Hardness	Abs. Energy(FITB) 1 2 3 Avg	% Shear 1 2 3 Avg	Tst Temp	Tst Dir	Tst Siz (mm)	BDWTT Temp %Str																																				
540798	C0005	0.308 X 60.00	L	56000	70000		38	T																																											
540798	C0006	0.183 X 60.00	L	63000	73000		35	T																																											
Heat Id Chemical Analysis Melted in <table border="1"> <tr> <td>540798</td> <td>C</td> <td>Mn</td> <td>P</td> <td>S</td> <td>Si</td> <td>Total</td> <td>Al</td> <td>Cu</td> <td>Ni</td> <td>Cr</td> <td>Mo</td> <td>Cb</td> <td>V</td> <td>Ti</td> <td>B</td> <td>N</td> <td>CEV</td> </tr> <tr> <td></td> <td>.05</td> <td>.84</td> <td>.008</td> <td>.005</td> <td>.15</td> <td>.053</td> <td>.31</td> <td></td> <td>.19</td> <td>.16</td> <td>.06</td> <td>.011</td> <td>.003</td> <td>.022</td> <td>.0002</td> <td>.0068</td> <td>.27</td> </tr> </table> CAN																540798	C	Mn	P	S	Si	Total	Al	Cu	Ni	Cr	Mo	Cb	V	Ti	B	N	CEV		.05	.84	.008	.005	.15	.053	.31		.19	.16	.06	.011	.003	.022	.0002	.0068	.27
540798	C	Mn	P	S	Si	Total	Al	Cu	Ni	Cr	Mo	Cb	V	Ti	B	N	CEV																																		
	.05	.84	.008	.005	.15	.053	.31		.19	.16	.06	.011	.003	.022	.0002	.0068	.27																																		
MERCURY IS NOT A METALLURGICAL COMPONENT OF THE STEEL AND NO MERCURY WAS INTENTIONALLY ADDED DURING THE MANUFACTURE OF THIS PRODUCT HOT-ROLLED COIL INTENDED FOR CONVERSION TO GRADE. CERTIFIED TO CHEMISTRY ONLY. COIL END PHYSICAL TEST RESULTS, IF REPORTED, ARE FOR INFORMATION ONLY. BALANCE OF CHEMISTRY IS IRON (FE) MELTED AND POURED IN CANADA 540798 C0009 PCS: 1, WGT: 46780																																																			
Cust Practice:			WE HEREBY CERTIFY THAT THIS MATERIAL WAS TESTED IN ACCORDANCE WITH THE APPROPRIATE SPECIFICATION			Approved By: Kendal Dunnatt			Quality Representative																																										

Wrap (Body)

Warehouse Transfer
From Delta Varsteel to Corporate C

<u>Transfer No</u>	<u>Heat Number</u>
231251	540678

<u>Shipper No</u>	<u>Heat Number</u>
17119	540678

Form TCI: Revision 2: Date 13 Feb 2017

P.O. Box 1670, Regina, Saskatchewan, Canada S4P 3C7

Form TCI: Revision 2: Date 13 Feb 2017

Customer P.O. No. CIT-867	MM Q
Product Description: CSA G40.21(2010)44/500 35W/45M A36(19)	
A70701A36/45/SHS S36(1B)	
CSA G40.21(2004)240W	

11-25384-07	Shipping Method: KRT12692
Ship Date: 14 Oct 21	Cart No: 07111073
Cart Date: 14 Oct 21	(Page 1 of 1)

Size (MMb): 0.365 X 60.00 X COIL. (IN)

Tested Faces

Teeth

Chargy Impact Test

1

1

19

1

22

(22)

25

Partners	1	1
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3 Aug 11 2

Page 3

Temp 25th

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Ha-

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2

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Statistical Analysis

21

Life

ID	C	Mag	P	S	S	TRAI	Co	N	C	SS	DS	V	T	B	R
5540678	.05	.56	.009	.012	.13	.057	.34	.17	.12	.04	.077	.001	.000	.0002	.0033
5540679	.05	.58	.014	.013	.13	.042	.30	.21	.17	.06	.023	.001	.000	.0002	.0078

183 078	CAN CAN
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BEARING THE MANUFACTURE OF THIS PRODUCT.
REPORT IS NOT A FATHOMABLE CONCEPT OF THE STATE, AND NO REPORT HAS INDIVIDUALLY AND
HOT-ROLLED COIL INTENDED FOR CONVERSION TO GRADE. EXPERTS TO CHEMISTRY ONLY.
COIL FIB PHYSICAL TEST RESULTS, IT REPORTED, ARE FOR INFORMATION ONLY.
BALANCE OF CHEMISTRY IS TONER (EN)
HEATED AND PULSED IN CANADA

[illegible]

P

Cost Practices

WE HEREBY CERTIFY THAT THIS MATERIAL
WAS TESTED IN ACCORDANCE WITH THE
APPROPRIATE SPECIFICATION

Approved By:

Kriminal District

NUCOR®

1/2 A36

MILL TEST CERTIFICATE

21A1476

Page: 1 of 1

NUCOR STEEL TUSCALOOSA, INC.

Nucor Steel Tuscaloosa, Inc.
1700 HOLT RD N.E.
Tuscaloosa, AL 35404-1000
800 800-8204
customer.service@nucorsteel.com

Load Number	Qty	HTI Order Number	PO NO.	Line NO	Part Number	Certificate Number	Prepared
R274588	00000000994369	N-189836-002	3825978	2		599436901-1	04/24/2021 01:07
Grade	Customer:						
Order Description:	Hot Roll Coil						Sold TO:
A36, 0.4900 IN MIN x 60.000 IN MIN	Quality Plan Description:						Ship TO:
A36 LASER COIL: Coil for conversion to A36/SA36 laser quality							Sent TO:

Shipped Item	Heat/Slab Number	Certified By	C	Mn	P	S	Si	Cu	NI	Cr	Mo	Co	V	Al	Ti	NZ	B	Ca	Sn	CEV	AGI
ID2263	21A1476-03 ***	21A1476	0.19	0.86	0.011	0.002	0.05	0.26	0.08	0.10	0.020	0.002	0.004	0.028	0.002	0.007	0.0001	0.0012	0.005	0.38	

Shipped Item	Certified By	Heat/Slab Number	Yield ksi	Tensile ksi	V/T %	ELONGATION %		Bend OK?	Hard HB	Charpy Impacts (ft-lbs)					Shear %			Test Temp			
						2"	8"			Size mm	1	2	3	Avg	1	2	3		Avg		
ID2263	SI02263CTT	21A1476-03 ***	51.4	71.2	72.2	34.3															

Items: 1 PCS 1 Weight: 62220 LBS

Packing Box Sides

Mercury has not come in contact with this product during the manufacturing process nor has any mercury been used by the manufacturing process. Certified in accordance with EN 10204 3.1. No weld repair has been performed on this material. Yield strength is determined by the 0.2% offset method unless otherwise noted. Manufactured to a fully killed fine grain practice. ISO 9001:2015 Registered, PED Certified

We hereby certify that the product described above passed all of the tests required by the specifications.

*** Indicates Heats melted and Manufactured in the U.S.A.

Daniel Green
Daniel Green - Chief Metallurgist

IMR TEST LABS

A Curtiss-Wright Business Unit
www.imrportland.com

5687-A SE International Way
Portland, OR 97222

T: 1.503.653.2904 | F: 1.503.653.9591

Nut Retainers
Stuffer Ends

TEST REPORT

IMR Report Number 202111333B

SUMMARY

One sample was received for mechanical testing.

The sample meets the specified tensile requirements of ASTM A572-21st, Gr. 50 for plates.

ROOM TEMPERATURE TENSILE TEST

Laboratory Number	Tensile Strength (ksi)	Yield Point (ksi)	Elongation in 2" (%)	Orig. Gauge Width (in.)
2111333-2FTT	88.5	67.5	30	0.504
Specification Req. (Min.)	65	50	19	

Yield point determined by 0.5% extension method

Direction = Transverse

Method(s): ASTM A370-20 and ASTM A6-19

October 21, 2021

Product

Material

Part Number

PO Number

1052

Date Received

October 13, 2021

Material

5/8" Thick Steel Plate

Material Identity

Heat# B11709

Specification(s)

ASTM A572-21st, Gr. 50



Reviewed by

Adam Shaney

Adam Shaney, CWI
Technical Review

All procedures were performed in accordance with the IMR Quality Manual, current revision, and related procedures; and the P&W MCL Manual F-23 and related procedures as applicable. The information contained in this test report represents only the material tested and may not be reproduced, except in full, without the written approval of IMR Test Labs ("IMR"). IMR maintains a quality system in compliance with the ISO 9001:2015 and is accredited by A2LA, certificate #1144.07. IMR will perform all testing in good faith using the proper procedures, trained personnel, and equipment to accomplish the testing required. Conformance will be based on results without measurement uncertainty applied, unless otherwise requested by the customer. IMR's liability to the customer or any third party is limited at all times to the amount charged for the services provided. All test samples will be retained for a minimum of 3 months and may be destroyed thereafter, unless otherwise specified by the customer. The recording of false, fictitious, or fraudulent statements or entries on this document may be punished as a felony under federal statutes. IMR Test Labs is a GEAE S-400 approved lab (Supplier Code T4260).

State Plate

Page 1 of 1

IMR PTL #202111333B

B11709

5/8" A572-50

STATEMENT OF ANALYSIS

CONSIGNEE:

DATE: 27 Sep 2021

BILL OF LADING NO.: MR445036

MILL ORDER NO.(s) 41-655074 41-655074

COVER, WA 98662

PRODUCT: PIPE HSS

SHEET X PLATE COIL

THE ANALYSIS OF THE PRODUCT ON THIS LOAD IS AS FOLLOWS:

SIZE		GRADE					HEAT NO.							
ELEMENT - ALLOY THRESHOLD														
%C	%Mn	%B	%Ti	%Si	%Cu	%Ni	%Cr	%P	%S	%V	%CB	%Mo	%AL	
—	1.65	.0008	0.05	0.60	0.40	0.30	0.30	—	—	0.10	0.06	0.08	0.30	
0.000 X 0 X				SECONDS			US		A11139 B47					
0.16	1.19	.0000	0.006	0.04	0.29	0.15	0.15	0.016	0.008	0.069	0.030	0.04	0.033	
0.000 X 0 X				SECONDS			US		B11709 D09					
0.16	1.03	.0002	0.008	0.19	0.38	0.27	0.42	0.012	0.004	0.049	0.025	0.03	0.034	
0.000 X 0 X				SECONDS			US		B11709 D09					
0.16	1.03	.0002	0.008	0.19	0.38	0.27	0.42	0.012	0.004	0.049	0.025	0.03	0.034	
0.000 X 0 X				SECONDS			US		B11709 D10					
0.16	1.03	.0002	0.008	0.19	0.38	0.27	0.42	0.012	0.004	0.049	0.025	0.03	0.034	
0.000 X 0 X				SECONDS			US		B11709 D10					
0.16	1.03	.0002	0.008	0.19	0.38	0.27	0.42	0.012	0.004	0.049	0.025	0.03	0.034	
0.000 X 0 X				SECONDS			US		B1H597 A41					
0.20	1.12	.0001	0.008	0.18	0.29	0.15	0.15	0.012	0.003	0.004	0.000	0.01	0.029	
0.000 X 0 X				SECONDS			US		B1H597 A41					
0.20	1.12	.0001	0.008	0.18	0.29	0.15	0.15	0.012	0.003	0.004	0.000	0.01	0.029	
0.000 X 0 X				SECONDS			US		B1H597 A41					
0.20	1.12	.0001	0.008	0.18	0.29	0.15	0.15	0.012	0.003	0.004	0.000	0.01	0.029	

We trust this is the information you require.
 Very truly yours,
 SSAB IOWA INC.

Shipping

Export Declaration Exempt: NOEEI 30.36

Horseshoe (Body)
Gland Flange

TEST REPORT

IMR Report Number 202200305A

SUMMARY

One sample was received for mechanical testing.

The sample meets the specified tensile requirements of ASTM A572-21st, Gr. 50 for plates.

January 12, 2022

James Rhyasen
State Plate
7510 NE 99th St
Vancouver, WA 98662

PO Number
1074

Date Received
January 10, 2022

Material
3/4" Thick Steel Plate

Material Identity
Heat# A1H917

Specification(s)
ASTM A572-21st, Gr. 50

ROOM TEMPERATURE TENSILE TEST

Laboratory Number	Tensile Strength (ksi)	Yield Point (ksi)	Elongation In 2" (%)	Orig. Gauge Width (in.)
2200305-1FTT	88.5	66.0	30	0.504
Specification Req. (Min.)	65	50	19	

Yield point determined by 0.5% extension method
Method(s): ASTM A370-20 and ASTM A6-19



Reviewed by

Elwin Aragom

Elwin Aragom
Technical Review

All procedures were performed in accordance with the IMR Quality Manual, current revision, and related procedures; and the PSW MCL Manual F-23 and related procedures as applicable. The information contained in this test report represents only the material tested and may not be reproduced, except in full, without the written approval of IMR Test Labs ("IMR"). IMR maintains a quality system in compliance with the ISO/IEC 17025 and is accredited by A2LA, certificate #140.07. IMR will perform all testing in good faith using the proper procedures, trained personnel, and equipment to accomplish the testing required. Conformance will be based on results without measurement uncertainty applied, unless otherwise requested by the customer. IMR's liability to the customer or any third party is limited at all times to the amount charged for the service provided. All test samples will be retained for a minimum of 3 months and may be destroyed thereafter, unless otherwise specified by the customer. The recording of false, fictitious, or fraudulent statements or entries on this document may be punished as a felony under federal statutes. IMR Test Labs is a GEAE S-400 approved lab (Supplier Code T4280).

A1H917

3/4 AS22

PMI

STATEMENT OF ANALYSIS

Page 1 Of 4

CONSIGNEE:

STATE PLATE LLC

7510 NE 99TH ST

DATE: 19 Dec 2021

BILL OF LADING NO.: MR451682

MILL ORDER NO.(s) 41-662125 41-662125

VANCOUVER, WA 98662

PRODUCT: PIPE _____ HSS _____

SHEET X PLATE _____ COIL _____

THE ANALYSIS OF THE PRODUCT ON THIS LOAD IS AS FOLLOWS:

SIZE	GRADE						HEAT NO.						
ELEMENT - ALLOY THRESHOLD													
%C	%Mn	%B	%Ti	%Si	%Cu	%Ni	%Cr	%P	%S	%V	%CB	%Mo	%AL
—	1.65	.0008	0.05	0.60	0.40	0.30	0.30	—	—	0.10	0.06	0.08	0.30
0.000 X 0 X				SECONDS			US		A1K203 C18				
0.06	0.97	.0003	0.008	0.34	0.38	0.20	0.56	0.011	0.002	0.084	0.031	0.04	0.028
0.000 X 0 X				SECONDS			US		A1K203 C14				
0.06	0.97	.0003	0.008	0.34	0.38	0.20	0.56	0.011	0.002	0.084	0.031	0.04	0.028
0.000 X 0 X				SECONDS			US		B1J653 C20				
0.06	1.26	.0004	0.009	0.37	0.37	0.28	0.53	0.012	0.003	0.068	0.029	0.03	0.036
0.000 X 0 X				SECONDS			US		A1H917 D25				
0.17	1.19	.0002	0.008	0.10	0.33	0.20	0.16	0.011	0.006	0.066	0.020	0.03	0.029
0.000 X 0 X				SECONDS			US		B1J777 A02				
0.06	1.23	.0003	0.008	0.31	0.34	0.26	0.53	0.011	0.005	0.064	0.029	0.02	0.029
0.000 X 0 X				SECONDS			US		B1H651 D13				
0.07	1.47	.0003	0.008	0.23	0.36	0.20	0.30	0.013	0.003	0.097	0.049	0.05	0.037
0.000 X 0 X				SECONDS			US		B1H651 D13				
0.07	1.47	.0003	0.008	0.23	0.36	0.20	0.30	0.013	0.003	0.097	0.049	0.05	0.037
0.000 X 0 X				SECONDS			US		B1H651 D13				
0.07	1.47	.0003	0.008	0.23	0.36	0.20	0.30	0.013	0.003	0.097	0.049	0.05	0.037

We trust this is the information you require.
 Very truly yours,
 SSAB IOWA INC.

Shipping

Export Declaration Exempt: NOEEI 30.36

IMR TEST LABS

A Curtiss-Wright Business Unit
www.imrportland.com

5687-A SE International Way

Portland, OR 97222

T: 1.503.653.2904 | F: 1.503.653.9591

Port Flanges (Body)
Top Flange
Yoke Top
Yoke Pads

TEST REPORT

IMR Report Number 202111757E

SUMMARY

One sample was received for mechanical testing.

The sample meets the specified tensile requirements of ASTM A572-21st, Gr. 50 for plates.

ROOM TEMPERATURE TENSILE TEST

Laboratory Number	Tensile Strength (ksi)	Yield Point (ksi)	Elongation in 4D (%)	Orig. Gauge Dia. (in.)
2111757-4RTT	92.5	75.0	27	0.503
Specification Req. (Min.)	65	50	19	

Direction = Transverse @ 1/4 Thick

Method(s): ASTM A370-20 and ASTM A6-19

November 1, 2021

January 1, 2022

V

PO Number
1057

Date Received
October 22, 2021

Material
1" Thick Steel Plate

Material Identity
Heat# E11024

Specification(s)
ASTM A572-21st, Gr. 50

Reviewed by

Adam Shaney, CWI
Technical Review

All procedures were performed in accordance with the IMR Quality Manual, current revision, and related procedures; and the P&W MCL Manual F-23 and related procedures as applicable. The information contained in this test report represents only the material tested and may not be reproduced, except in full, without the written approval of IMR Test Labs ("IMR"). IMR maintains a quality system in compliance with the ISO/IEC 17025 and is accredited by AZLA, certificate #1140.07. IMR will perform all testing in good faith using the proper procedures, trained personnel, and equipment to accomplish the testing required. Conformance will be based on results without measurement uncertainty applied, unless otherwise requested by the customer. IMR's liability to the customer or any third party is limited at all times to the amount charged for the service provided. All test samples will be retained for a minimum of 3 months and may be destroyed thereafter, unless otherwise specified by the customer. The recording of false, fictitious, or fraudulent statements or entries on this document may be punished as a felony under federal statutes. IMR Test Labs is a GEAS S-400 approved lab (Supplier Code T4280).

State Plate

E11024

1" A572-50

PMI

STATEMENT OF ANALYSIS

Page 2 Of 3

CONSIGNEE:

DATE: 26 Sep 2021

75' 3T

BILL OF LADING NO.: AR344102

MILL ORDER NO.(s) 41-655074 41-655074

VANCOUVER, WA 98662

PRODUCT: PIPE _____ HSS _____ SHEET X PLATE _____ COIL _____

THE ANALYSIS OF THE PRODUCT ON THIS LOAD IS AS FOLLOWS:

SIZE							GRADE		HEAT NO.					
ELEMENT - ALLOY THRESHOLD														
%C	%Mn	%B	%Ti	%Si	%Cu	%Ni	%Cr	%P	%S	%V	%CB	%Mo	%AL	
—	1.65	.0008	0.05	0.60	0.40	0.30	0.30	—	—	0.10	0.06	0.08	0.30	
0.000 X 0 X				SECONDS			US		W1H575 C04					
0.19	1.08	.0001	0.007	0.23	0.33	0.14	0.10	0.010	0.001	0.005	0.004	0.11	0.025	
0.000 X 0 X				SECONDS			US		E1I024 A16					
0.15	1.33	.0001	0.006	0.03	0.22	0.10	0.14	0.009	0.001	0.077	0.035	0.04	0.029	
0.000 X 0 X				SECONDS			US		E1H295 D80					
0.18	0.28	.0001	0.022	0.17	0.29	0.09	0.11	0.007	0.001	0.000	0.000	0.04	0.029	
0.000 X 0 X				SECONDS			US		E1I024 A16					
0.15	1.33	.0001	0.006	0.03	0.22	0.10	0.14	0.009	0.001	0.077	0.035	0.04	0.029	
0.000 X 0 X				SECONDS			US		E1I024 A16					
0.15	1.33	.0001	0.006	0.03	0.22	0.10	0.14	0.009	0.001	0.077	0.035	0.04	0.029	
0.000 X 0 X				SECONDS			US		E1I024 A16					
0.15	1.33	.0001	0.006	0.03	0.22	0.10	0.14	0.009	0.001	0.077	0.035	0.04	0.029	
0.000 X 0 X				SECONDS			US		W1H575 C04					
0.19	1.08	.0001	0.007	0.23	0.33	0.14	0.10	0.010	0.001	0.005	0.004	0.11	0.025	
0.000 X 0 X				SECONDS			US		W1H801 A06					
0.15	1.42	.0001	0.008	0.18	0.25	0.20	0.14	0.008	0.000	0.092	0.042	0.03	0.035	

We trust this is the information you require.
 Very truly yours,
 SSAB ALABAMA INC.

Shipping

Export Declaration Exempt: NOEEI 30.36

10-19-2021 16:33

Load - 3954066

BL - 17125176

blr466

Bridge City Steel LLC

Heat - A11824

Cust. PO - 227024

Order - 20469874

SSAB**Test Certificate**

1770 Bill Sharp Boulevard, Muscatine, IA 52781-9412, US

WARNING: This product can expose you to chemicals including nickel and nickel compounds, which are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

Form TCI: Revision 4: Date 8 Feb 2019

Customer: ON		Customer P.O.No.: 17660346		Mill Order No. 41-649113-08		Shipping Manifest: MR446052																																											
Product Description: ASTM A36(19)/A709(16)36/ASME SA36(21) AASHTO M270(20)35, 0.60-1.20 MN		Ship Date: 29 Sep 21		Cert No: 081127592		Cert Date: 25 Sep 21 (Page 1 of 1)																																											
Size: 1.000 X 98.00 X 480.0 (IN)																																																	
Tested Pieces:		Tensiles:		Charpy Impact Tests																																													
Heat Id	Place Id	Tested Thickness	Tst Loc	YS (KSI)	UTS (KSI)	%RA	Elong % 2In 6In	Tst Dir	Hardness	Abs. Energy(FTLB) 1 2 3 Avg	% Shear 1 2 3 Avg	Tst Tmp	Tst Dir	Tst Siz (mm)	BDWTT Tmp %Shr																																		
A11824	C38	0.999 (DISCRT)	L S1	75			25	Y																																									
Heat Chemical Analysis <table border="1"> <tr> <th>Heat Id</th> <th>C</th> <th>Mn</th> <th>P</th> <th>S</th> <th>Si</th> <th>Tot Al</th> <th>Cu</th> <th>Ni</th> <th>Cr</th> <th>Mo</th> <th>Cb</th> <th>V</th> <th>Ti</th> <th>B</th> <th>N</th> <th>INW</th> </tr> <tr> <td>A11824</td> <td>0.18</td> <td>0.98</td> <td>0.014</td> <td>0.007</td> <td>0.10</td> <td>0.023</td> <td>0.34</td> <td>0.14</td> <td>0.16</td> <td>0.03</td> <td>0.000</td> <td>0.010</td> <td>0.012</td> <td>0.0001</td> <td>0.0036</td> <td>0.42</td> </tr> </table> ORGN USA KILLED STEEL MERCURY IS NOT A METALLURGICAL COMPONENT OF THE STEEL AND NO MERCURY WAS INTENTIONALLY ADDED DURING THE MANUFACTURE OF THIS PRODUCT. CEV (IIR) = C + MN/6 + (CR+MO+V)/5 + (NI+CU)/15 MTR EN 10204:2004 INSPECTION CERTIFICATE 3.1 COMPLIANT 100% MELTED, POURED, AND ROLLED IN THE USA PRODUCTS SHIPPED: A11824 C38 PCS: 3, LBS: 33204																Heat Id	C	Mn	P	S	Si	Tot Al	Cu	Ni	Cr	Mo	Cb	V	Ti	B	N	INW	A11824	0.18	0.98	0.014	0.007	0.10	0.023	0.34	0.14	0.16	0.03	0.000	0.010	0.012	0.0001	0.0036	0.42
Heat Id	C	Mn	P	S	Si	Tot Al	Cu	Ni	Cr	Mo	Cb	V	Ti	B	N	INW																																	
A11824	0.18	0.98	0.014	0.007	0.10	0.023	0.34	0.14	0.16	0.03	0.000	0.010	0.012	0.0001	0.0036	0.42																																	
Port Flanges (Body) Top Flange Yoke Top Yoke Pads																																																	
Cust Part #:		WE HEREBY CERTIFY THAT THIS MATERIAL WAS TESTED IN ACCORDANCE WITH, AND MEETS THE REQUIREMENTS OF, THE APPROPRIATE SPECIFICATION Brian Wales PRINCIPAL METALLURGIST																																															

1" A36 A11824

Gussets

12-09-2021 17:43

Load - 3982933

BL - 17125682

blr466

Bridge City Steel LLC

Heat - SB28388

Cust. PO - 227226

Order - 20917034

posco

Mill Test Certificate

Certificate No. : 210917-FP01PS-0015A1-0002

• **Data of Issue :- Oct., 07, 2021.**

Order No. : 0185147337

PO No. 7819353

:(၇၈၆၁၁၁)

Supplier : GS GLOBAL USA, INC.

Commodity : STEEL PLATE

Customer : KLOECKNER METALS CORP.

Spec & Type : A38/ASME SA38/A709-36(LATEST ED)

[illegible]

POSCO

Pohang Works, 6262, Donghaean-ro, Nam-gu, Pohang-si, Gyeongsangbuk-do, 37877, Korea

<PAGE:0>

Chief of material testing section

Bae, Tae Chul

T.C. BAE



**NORTH AMERICAN
STAINLESS**

METALLURGICAL TEST REPORT

6870 Highway 42 East
Ghent, KY 41045-9615
(502) 347-6000

Certificate: 711453 01 Mail To:
Customer: 5623 023

Ship To:

Date: 7/29/2021 Page: 1

105 ME
0

Steel: 304L

Finish: HRAP

Your Order: 0418-7455571

NAS Order: AN 0945151 03

Corrosion: ASTM A262/15 A;180Bend-0

PRODUCT DESCRIPTION:

STAINLESS STEEL CONT.MILL PLATE, HRAP; UNS 30403
ASTM A240/20,A480/20a,A666/15;ASME SA240/19,SA480/19,SA666/19
CHEM ONLY ON FOLLOWING ASTM: A276/17,A479/17,A484/16,A312/16
CHEM ONLY ON FOLLOWING ASME: SA312/13,SA479/13
AMS 5511K XMRK; MIL-5059D AMD3(X CRN MEAS); MIL-4043B
NACE MR0175/ISO 15156-3:2009 A, MR0103/07;QGS766D-A X MAG PERM
MIN. SOLUTION ANNEAL TEMP 1900F, WATER QUENCHED

REMARKS:

Mat'l is Free of Mercury Contamination. No weld repairs.
EN 10204:2004 3.1; RoHS 1, 2 & 3 Compliant
Material is Free of Radioactive Contamination
Steel Making Process: EAF, AOD, & Cont. Casting
Product Mfg.by a Quality Mgt.Sys. in Conf. w/ISO 9001
*Melted & Manufactured in the USA; Mat'l is DFARS Compliant
*Melted & Manufactured in the USA; Mat'l is DFARS Compliant

651060

Product ID #	Coil #	Thickness	Width	Weight	-----Length-----	Mark	Pieces
F90706	01N09P E	.2500	48.0000	3,585	SHEET	120.00	4 9

CHEMICAL ANALYSIS CM(Country of Melt) ES(Spain) US(United States) ZA(South Africa) JP(Japan) ANAB, ISO/IEC 17025, Certificate# L2323
Chemical Analysis per ASTM A751/20

HEAT	CM	C %	CR %	CU %	MN %	MO %	N %	NI %	P %	S %
N09P	US	.0238	18.1510	.4085	1.7010	.3810	.0836	8.0720	.0335	.0010
SI %										
.3010										

MECHANICAL PROPERTIES

Product ID #	Coil #	1 d o i c r	UTS KSI	20C .2% YS KSI	20C ELONG %-2"	Hard RB	Tail Hard
F90706	01N09P E	F T	93.06	47.16	51.67	84.00	83.50

QC ACCEPTED
DATE 8-19-21
INTLS 98

NAS hereby certifies that the analysis on this certification is correct. Based upon the results and the accuracy of the test methods used, the material meets the specifications stated. These results relate only to the items tested and this report cannot be reproduced, except in its entirety, without the written approval of NAS.

Technical
Dept. Mgr.

KRIS LARK

7/29/2021

Prevzemni certifikat 3.1 / Inspection Certificate 3.1 / Abnahmeprüfzeugnis 3.1 EN 10204 2004	Prejemnik / Consignee / Empfänger JACQUET WEST 22400 LUCERNE STREET 90745 CARSON UNITED STATES
Št. dokumenta / Document No. / Bescheinigungs Nr. 10162251-20030266-174390 z / dated / vom 31.03.2021	Proizvajalčeva št. naročila / Manufacturer's works order No. / Werksauftrag Nr. 20030266 z / dated / vom 02.02.2021
Kupčeva št. naročila / Purchaser's order No. / Kundenbestell Nr. 11879-52250	Kupčeva št. izdelka / Purchaser Article No. / Artikel Nr. des Kunden
Št. Dobavnega lista / Packing list No. / Lieferschein Nr. 10162251 z / dated / vom 31.03.2021	
Št. Računa / Account No. / Kontonummer 2120101005790	Datum izdaje / Date of issue / Ausgabedatum 31.03.2021

DEBELA PLOČA VARNOSTNA / HOT ROLLED PLATE WARMGEWALZTES GROBELECH	
Zahteva / Requirements / Anforderungen	Oznaka jekla / Steel designation / Stahlbezeichnung
ASME SA-693 BPVC.II.A-2019 (ANNEALED)	S17400 630
ASTM A 693:2016 (annealed)	S17400 630
SAE AMS 5604-J (LAB.H900 ANNEALED) (Acroni is not AS9100 certified)	S17400 630
Customer Grade	HOT ROLLED STAINLESS STEEL 17-4PH
Specifikacija kupca / Customer specification No. / Kundenspezifikation	
Dodatne zahteve / Supplementary requirements / Zusätzliche anforderung	
Dobavno stanje / Product delivery condition / Lieferzustand des Erzeugnisses	
ŽARJENO / ANNEALED / GEGLÜHT	
Stanje površine / Surface finish / Oberflächenbehandlung	
Brez popravila z varjenjem / No weld repair / Keine Schweißreparatur	

Oznaka izdelka / Marking of the product / Bescheinigungsnummer	Oznaka jekla / Steel designation / Stahlbezeichnung	Št. plošča / Plate No. / Tafel Nr.	Št. serije / Heat No. / Schmelzen Nr.	Dimenzije izdelka / Product dimensions / Abmessungen des Erzeugnisses	Zig kontrolorja / Stamp of the works inspector / Stempel des Werkssachverständigen	Zig prevzemalca / Stamp of the inspection representative / Stempel des Abnahmebeauftragten
SIJ ACRONI						
Dodatne oznake / Other marks / Andere Kennzeichen						

Poz. / Item / Pos.	Št. serije / Heat No. / Schmelzen Nr.	Št. plošča / Plate No. / Tafel Nr.	Teoretična teža / Mass / Masse	Teža neto / Actual mass / Ist Masse	Dimenzije izdelka / Product dimension / Maße des Erzeugnisses	Št. kosov / No. of pieces / Stückzahl	Št. vzorca / Sample No. / Probe Nr.
1	315536	2032635602	1864.19 (kg)	1840.00 (kg)	0.750 / 79.00 / 240.00 (inch)	1	2032635602

Način izdelave jekla / Steel-making process / Stahlherstellungsverfahren E + VOD

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Odgovorna oseba / Werkssachverständiger / Works Expert : Gorazd Kosec

JACQUET
FICHE#
45988

Po # 11428 750" 17-4 H# 315536

Originals; Centurina:
Originator of Inspection Document
Aussteller der Beschreibung:

SU ACRON, d.o.o.
 CRIST-KAKOVOST
 Cesta Borkova 104/11a 44
 SI - 4270 Jesenice
 Slovenia, EU
 Tel: +386 4 684 10 16
 Fax: +386 4 684 10 71
 E-Mail: export@acron.si
 Web: <http://www.acron.si>

Pogol / topografie obdelave / Heat treatment details / Wärmebehandlung Details
 Solution annealing at 1900°F +/-25°F (1038°C +/- 14°C) for a time commensurate with thickness and cooling to below 90°F (32°C).
 Precipitation hardening at 900°F +/-10°F (482°C +/- 6°C) for 60 minutes +/- 5 minutes

Precipitation hardening at 900°F +/- 10°F (482°C +/- 5°C) for 60 minutes +/- 5 minutes

[illegible][illegible]

1/12	Odzem vzorca na sredini / Taking the sample at the center of product / Unter der Probe in der Mitte des Produkts	1/12	Odzem vzorca na površini / Thickness 1/3 under the surface / Dicke 1/3 unter der Oberfläche
1/13	Odzem vzorca po debi 1/3 pod površino / Thickness 1/3 under the surface / Dicke 1/3 unter der Oberfläche	1/13	Odzem vzorca po debi 1/4 pod površino / Thickness 1/4 under the surface / Dicke 1/4 unter der Oberfläche
1/14	Odzem vzorca po debi 1/4 pod površino / Thickness 1/4 under the surface / Dicke 1/4 unter der Oberfläche	1/14	Odzem vzorca po debi 2 mm pod površino / Thickness 2 mm under the surface / Dicke 2 mm unter der Oberfläche
1/15	Odzem vzorca po debi 2 mm pod površino / Thickness 2 mm under the surface / Dicke 2 mm unter der Oberfläche	1/15	Odzem vzorca po debi 2 mm pod površino / Thickness 2 mm under the surface / Dicke 2 mm unter der Oberfläche

Schmelzen Nr.		St. ganze	Heat No.	Zahl der Requiere		MAX	MIN	Anforderung	
St. ganze		Heat No.	Zahl der Requiere		MAX	MIN	Anforderung		302.0
Schmelzen Nr.		St. ganze	Heat No.	Zahl der Requiere		MAX	MIN	Anforderung	
St. ganze		Heat No.	Zahl der Requiere		MAX	MIN	Anforderung		353.0
Schmelzen Nr.		St. ganze	Heat No.	Zahl der Requiere		MAX	MIN	Anforderung	
St. ganze		Heat No.	Zahl der Requiere		MAX	MIN	Anforderung		1
Schmelzen Nr.		St. ganze	Heat No.	Zahl der Requiere		MAX	MIN	Anforderung	
St. ganze		Heat No.	Zahl der Requiere		MAX	MIN	Anforderung		Merley / Measurement / Messungen

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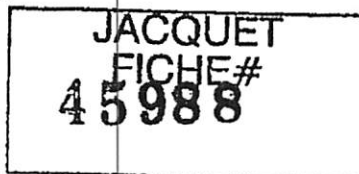
H 900 - Mechanical properties at Precipitation hardening condition at 900°F / 482°C

Mehanične lastnosti / Mechanical properties / Eigenschaften der mechanischen Eigenschaften / Simulation der Warmbehandlung														
Sl. serže Heat No. Schmelzen Nr.	Sl. vzorca Sample No. Probe Nr.	Smer vzorca Sample orientation Proben lage			Meja plastičnosti Yield or proof strength Streck- oder Dehngrenze		Nat. trdnost Tensile str. Zugfestigkeit (KSI)	Zg. meja plastičnosti Upper Yield strength Obere Streckgrenze (KSI)	Kontrakcija Reduction of area Bruchseinschnürung (%)	Raztezek Elongation Bruchdehnung			Razmerje Ratio Beziehung	Trdota Hardness Härte
					(KSI)	(KSI)				(%)	(%)	(%)		
		T/L	T/B	1/2; 1/3; 1/4; S2	Rp0,2	Rp1,0	Rm	ReH	Z	A5	A50	A80	Rp/Rm	
Zahteve Requirements Anforderung		MIN												
		MAX												
315536	2032635602	T	T	S2	170.0		193.77		42.0		11.0			
T- Prečno / Transverse / Quer L- Vzdolžno / Longitudinal / Längs T- Glava / Top / Kopf B- Noga / Bottom / Fuss 1/2 - Odvzem vzorca na sredini / Taking the sample at the center of product / Unter der Probe in der Mitte des Produkt 1/3 - Odvzem vzorca po deb 1/3 pod površino / Thickness 1/3 under the surface / Dicke 1/3 unter der Oberfläche 1/4 - Odvzem vzorca po deb 1/4 pod površino / Thickness 1/4 under the surface / Dicke 1/4 unter der Oberfläche S2- Odvzem vzorca po deb 2 mm pod površino / Thickness 2 mm under the surface / Dicke 2 mm unter der Oberfläche														

Trdnost / Tensile strength / Festigkeit / Zugfestigkeit / Härte / Simulation der Warmbehandlung (HB)													
Sl. serže Heat No. Schmelzen Nr.	Sl. vzorca Sample No. Probe Nr.	Meritev / Measurement / Messungen											
													1
Zahteva Requirem Anforderung	MIN												375.0
	MAX												444.0
315536	2032635602												388.0

Kemikalna Analiza / Chemical Composition / Chemische Zusammensetzung / Analyse													
Sl. Serže / Heat No. / Schmelzen Nr.	315536												
%C	%Si	%Mn	%P	%S	%Cr	%Ni	%Cu	%Mo	%Nb	%Ta	%Co		
0.031	0.316	0.814	0.013	0.0001	15.11	4.23	3.409	0.081	0.206	0.007	0.017		

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Dodane zahteve: / Additional requirements: / Zusätzliche Anforderungen:
Sl. sarže / Heal No. / Schmelzen Nr.: 315536

Nb+Ta 0.213

Kontrola oznak, identifikacije, površine, oblike in dimenzij / Control of marking and identification, surface appearance, shape and dimensional properties / Prüfung von Kennzeichnung, Identifizierung, Oberfläche, Form und Maße:

ASTM A480/A480M-20 OK
ASME SA 480 Ed.2019 OK

Nepoškodljive preiskave / Non destructive test / Zerstörungsfreie Prüfungen

Ultrazvočni pregled: / Ultrasonic inspection: / Ultraschallprüfung:

Ultrazvočni pregled po EN10160-S2-E3: OK / Ultrasonic inspection acc. EN10160-S2-E3: OK / Ultraschallprüfung nach, EN10160-S2-E3: OK

Opombe / Remarks / Bemerkungen

Poljuben da dobavljati izdelki ustrezajo zahtevam narocila / We confirm herewith that the delivered products comply with the purchase order / Es wird bestätigt, daß die Erzeugnisse den Bestellanforderungen entsprechen
Država porekla = Država izdelave taline = Država izdelave slaba - SLOVENIJA - EU / Country of Origin = Country of melt = Country of slab: SLOVENIA - EU /
Herkunftsland = Land der Schmelze = Land der Bramme - SLOVENIA - EU
Material ni kontaminiran z živilnim srebrom. / Free from Known Contamination with Mercury. / Keine Kontamination mit Quecksilber.
Material je skladen z RoHS direktivo. Podrobneosti na: https://sil.acroni.si/assets/magazine-files/RoHS-declaration-April-2020.pdf / Material fully comply with RoHS directive. Details on: https://sil.acroni.si/assets/magazine-files/RoHS-declaration-April-2020.pdf / Material ausgestellt mit RoHS-Richtlinien, Einzelheiten

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JACQUET
FICHE#
45988

Gate MTR

sij | acroni

10162251-20030266-174390

Izdajatelj Certifikata:
Originator of Inspection Document:
Aussteller der Bescheinigung:

SIJ ACRONI d.o.o.
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Cesta Borisa Kidriča 44
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Slovenia, EU

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Page 5 / 5

auf: <https://sij.acroni.si/assets/magazine-files/RoHS-declaration-April-2020.pdf>

Sistem vodenja kakovosti je certificiran po ISO 9001. Št. Certifikata: 12 100 6200 TMS. Izdajatelj: TÜV SÜD Management Service GmbH. / Quality Management System is certified according to ISO 9001. Certificate no. 12 100 6200 TMS, issued by TÜV SÜD Management Service GmbH. / Qualitätsmanagementsystem zertifiziert nach ISO 9001. Zertifikat Nr. 12 100 6200 TMS der TÜV SÜD Management Service GmbH.

Merilne sevanja: NI RADIOAKTIVNEGA ONESNAŽENJA / Measuring Radiation: NO RADIOACTIVE CONTAMINATION / messen: KEINE ERHÖHTE RADIOAKTIVITÄT

Spektrometerska analiza PMI v skladu API RP 578: OK / Spectrometer Sorting Test PMI according API RP 578: OK / Spektrometer Sortiertest PMI nach API RP 578: OHNE BEANSTANDUNG

Vizualni pregled: OK / Visual inspection: OK / Sichtprüfung: OHNE BEANSTANDUNG

DFARS compliant per 252.225.7003 and 252.225.872-1

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Odgovorna oseba / Werkssachverständiger / Works Expert : Gorazd Kosec

JACQUET
FICHE#

45988

PO 13782 Item #2
16" FV-150 T-Lok
Gate PMI

INTERNATIONAL INSPECTION

Reading No.	Time	Type	Duration	Units	Sequence	Item Description	Material ID	Ni	Ni Error	Cr	Cr Error	Results
1	4/15/2022 7:14	System Check	53.64	cps	Final	System Check 1 of 2						Pass
2	4/15/2022 7:15	System Check	54.06	cps	Final	System Check 2 of 2						Pass
3	4/15/2022 7:16	General Metals	10	%	Final	IARM 35NN Calibration Standard	1.25Cr(P11) : 0.75	0.157	0.045	1.113	0.047	Pass
4	4/15/2022 7:21	General Metals	10	%	Final	Job# 933-2 - 6" DSDE (1 of 9)	17-4 PH : *2.22	4.63	0.145	15.738	0.15	Pass
5	4/15/2022 7:22	General Metals	10	%	Final	Job# 933-2 - 6" DSDE (2 of 9)	17-4 PH : *2.58	4.734	0.143	15.667	0.146	Pass
7	4/15/2022 7:24	General Metals	10	%	Final	Job# 933-2 - 6" DSDE (3 of 9)	17-4 PH : *2.21	4.697	0.148	15.696	0.152	Pass
8	4/15/2022 7:24	General Metals	10	%	Final	Job# 933-2 - 6" DSDE (4 of 9)	17-4 PH : *2.21	4.7	0.147	15.721	0.152	Pass
9	4/15/2022 7:25	General Metals	10	%	Final	Job# 933-2 - 6" DSDE (5 of 9)	17-4 PH : *2.21	4.718	0.158	15.601	0.161	Pass
10	4/15/2022 7:26	General Metals	10	%	Final	Job# 933-2 - 6" DSDE (6 of 9)	17-4 PH : *2.22	4.643	0.142	15.764	0.148	Pass
11	4/15/2022 7:27	General Metals	10	%	Final	Job# 933-2 - 6" DSDE (7 of 9)	17-4 PH : *2.22	4.677	0.14	15.843	0.145	Pass
12	4/15/2022 7:27	General Metals	10	%	Final	Job# 933-2 - 6" DSDE (8 of 9)	17-4 PH : *2.22	4.602	0.143	15.828	0.15	Pass
14	4/15/2022 7:29	General Metals	10	%	Final	Job# 933-2 - 6" DSDE (19 of 9)	17-4 PH : *2.22	4.665	0.144	15.679	0.148	Pass
15	4/15/2022 7:32	General Metals	10	%	Final	Job# 933-4 - 8" DSDE (1 of 14)	17-4 PH : 1.46	4.112	0.14	15.21	0.149	Pass
16	4/15/2022 7:32	General Metals	10	%	Final	Job# 933-4 - 8" DSDE (2 of 14)	17-4 PH : 1.21	4.053	0.138	15.155	0.147	Pass
17	4/15/2022 7:33	General Metals	10	%	Final	Job# 933-4 - 8" DSDE (3 of 14)	17-4 PH : 0.90	4.014	0.133	15.174	0.143	Pass
18	4/15/2022 7:33	General Metals	10	%	Final	Job# 933-4 - 8" DSDE (4 of 14)	17-4 PH : 0.78	3.968	0.136	15.378	0.148	Pass
19	4/15/2022 7:33	General Metals	10	%	Final	Job# 933-4 - 8" DSDE (5 of 14)	17-4 PH : 0.88	4.013	0.135	15.22	0.146	Pass
20	4/15/2022 7:34	General Metals	10	%	Final	Job# 933-4 - 8" DSDE (6 of 14)	17-4 PH : 1.47	4.106	0.135	15.357	0.145	Pass
21	4/15/2022 7:34	General Metals	10	%	Final	Job# 933-4 - 8" DSDE (7 of 14)	17-4 PH : 0.91	4.016	0.134	15.389	0.146	Pass
22	4/15/2022 7:35	General Metals	10	%	Final	Job# 933-4 - 8" DSDE (8 of 14)	17-4 PH : 1.57	4.12	0.138	15.034	0.147	Pass
23	4/15/2022 7:35	General Metals	10	%	Final	Job# 933-4 - 8" DSDE (9 of 14)	17-4 PH : 0.27	3.947	0.133	15.346	0.145	Pass
24	4/15/2022 7:35	General Metals	10	%	Final	Job# 933-4 - 8" DSDE (10 of 14)	17-4 PH : 1.30	4.066	0.134	15.336	0.144	Pass
25	4/15/2022 7:36	General Metals	10	%	Final	Job# 933-4 - 8" DSDE (11 of 14)	17-4 PH : 0.00	3.831	0.133	15.278	0.147	Pass
26	4/15/2022 7:36	General Metals	10	%	Final	Job# 933-4 - 8" DSDE (12 of 14)	17-4 PH : 1.12	4.04	0.136	15.431	0.147	Pass
27	4/15/2022 7:36	General Metals	10	%	Final	Job# 933-4 - 8" DSDE (13 of 14)	17-4 PH : *1.81	4.14	0.14	15.368	0.149	Pass
28	4/15/2022 7:37	General Metals	10	%	Final	Job# 933-4 - 8" DSDE (14 of 14)	17-4 PH : 1.20	4.053	0.146	15.066	0.156	Pass
29	4/15/2022 7:40	General Metals	10	%	Final	Job# 913-2 - 16" TLOK (1 of 2)	17-4 PH : 0.35	3.957	0.136	15.184	0.148	Pass
30	4/15/2022 7:40	General Metals	10	%	Final	Job# 913-2 - 16" TLOK (2 of 2)	17-4 PH : 0.91	4.017	0.143	15.251	0.154	Pass
36	4/15/2022 7:47	General Metals	10	%	Final	Job# 922 - 10" TLOK (1 of 1)	17-4 PH : *2.22	4.629	0.142	15.43	0.145	Pass

304L Composition Range (ASME Sec.II)

Chromium (Cr): 18.0 - 20.0

Nickel (Ni): 8.0 - 13.0

Technician: Daniel C Rosian 4/15/2022

D. C. Rosian

INTERNATIONAL INSPECTION

Reading No.	Time	Type	Duration	Units	Sequence	Item Description	Material ID	Ni	Ni Error	Cr	Cr Error	Results
37	4/15/2022 7:48	General Metals	10 %		Final	Job# 974 - 12" UNI (1 of 1)	SS-304 : 0.22	8.258	0.179	18.288	0.159	Pass
40	4/15/2022 7:51	General Metals	10 %		Final	Job# 955-2 - 16" TLOK (1 of 2)	17-4 PH : 1.42	4.095	0.136	15.382	0.146	Pass
41	4/15/2022 7:51	General Metals	10 %		Final	Job# 955-2 - 16" TLOK (2 of 2)	17-4 PH : 1.33	4.073	0.137	15.367	0.148	Pass
42	4/15/2022 7:53	General Metals	10 %		Final	Job# 909 - 16" DS (1 of 3)	SS-304 : 1.46	7.93	0.191	17.973	0.172	Pass
45	4/15/2022 7:55	General Metals	10 %		Final	Job# 909 - 16" DS (2 of 3)	SS-304 : 0.98	7.929	0.175	18.021	0.157	Pass
46	4/15/2022 7:55	General Metals	10 %		Final	Job# 909 - 16" DS (3 of 3)	SS-304 : 0.98	7.932	0.179	17.753	0.159	Pass
47	4/15/2022 7:57	General Metals	10 %		Final	Job# 936 - 12" UNI (1 of 1)	SS-304 : 0.00	8.195	0.184	18.132	0.163	Pass
48	4/15/2022 8:00	General Metals	10 %		Final	Job# 975-1 - 28" UNI (1 of 1)	SS-304 : 0.09	8.141	0.191	17.917	0.169	Pass
49	4/15/2022 8:01	General Metals	10 %		Final	Job# 922-2 - 16" TLOK (1 of 2)	17-4 PH : 1.49	4.125	0.136	15.322	0.145	Pass
50	4/15/2022 8:02	General Metals	10 %		Final	Job# 922-2 - 16" TLOK (2 of 2)	17-4 PH : 1.39	4.084	0.135	15.494	0.147	Pass
53	4/15/2022 8:05	General Metals	10 %		Final	Job# 935-1 - 10" UNI (1 of 1)	17-4 PH : *2.22	4.627	0.142	15.458	0.146	Pass
54	4/15/2022 8:07	General Metals	10 %		Final	Job# 820-3 - 48" TLOK (1 of 2)	SS-304 : 0.08	7.863	0.191	18.308	0.173	Pass
55	4/15/2022 8:07	General Metals	10 %		Final	Job# 820-3 - 48" TLOK (2 of 2)	SS-304 : 0.18	7.891	0.183	18.201	0.165	Pass
56	4/15/2022 8:13	General Metals	10 %		Final	Job# 820-1 - 42" TLOK (1 of 4)	SS-304 : 0.00	8.026	0.193	18.182	0.174	Pass
57	4/15/2022 8:14	General Metals	10 %		Final	Job# 820-1 - 42" TLOK (2 of 4)	SS-304 : 0.00	8.082	0.178	18.446	0.16	Pass
58	4/15/2022 8:16	General Metals	10 %		Final	Job# 820-1 - 42" TLOK (3 of 4)	SS-304 : 0.45	8.021	0.175	18.387	0.159	Pass
59	4/15/2022 8:19	General Metals	10 %		Final	Job# 820-1 - 42" TLOK (4 of 4)	SS-304 : 0.02	8.08	0.182	18.07	0.163	Pass
61	4/15/2022 8:23	General Metals	10 %		Final	Job# 955-1 - 10" TLOK (1 of 1)	17-4 PH : *2.21	4.602	0.151	15.546	0.155	Pass
62	4/15/2022 8:24	General Metals	10 %		Final	Job# 922-2 - 36" DSDE (1 of 1)	SS-304 : 0.00	8.196	0.176	18	0.156	Pass
63	4/15/2022 8:28	General Metals	10 %		Final	Job# 822-2 - 36" DSDE (1 of 1)	SS-304 : 0.00	8.062	0.178	18.01	0.159	Pass
64	4/15/2022 8:32	General Metals	10 %		Final	Job# 928-1 - 6" UNI (1 of 1)	SS-304 : 0.38	7.995	0.179	17.996	0.161	Pass
65	4/15/2022 8:44	General Metals	10 %		Final	IARM 35NN Calibration Standard	1.25Cr(P11) : 0.75	0.13	0.043	1.114	0.046	Pass

17-4PH Composition Range

Chromium (Cr): 15.0 - 17.5

Nickel (Ni): 3.0 - 5.0

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ANALYTICAL LTD

ISO Certified - 9001 - 17025 - 17043 - 17034

Certificate of Analysis

IARM 35NN

Low Alloy Steel / F11 / 1½Cr ½Mo / UNS K11572
Certified Reference Material

Values listed in wt.% with estimated uncertainties

Al	0.0134 ± 0.0005	As	0.0047 ± 0.0002	B	0.0003 ± 0.0001	Ca	0.0010 ± 0.0001
Co	0.0089 ± 0.0002	Cr	1.086 ± 0.001	Cu	0.174 ± 0.001	Fe*	97.22 ± 0.01
Mn	0.331 ± 0.001	Mo	0.478 ± 0.002	Nb	0.0017 ± 0.0001	Ni	0.125 ± 0.001
P	0.0063 ± 0.0001	Pb	0.0022 ± 0.0001	S	0.0038 ± 0.0005	Sb	0.0025 ± 0.0001
Si	0.559 ± 0.004	Sn	0.0087 ± 0.0001	Ta	0.0012 ± 0.0001	Ti	0.0019 ± 0.0001
V	0.0056 ± 0.0001	W	0.0035 ± 0.0001				



*Iron has been calculated as a balance element and was not directly measured by WD-XRF

Description and Intended Use

This Certified Reference Material comes in the form of a solid metal disk approximately 3mm thick by 38mm diameter. The intended use of this certified reference material may include, but is not limited to, the calibration of instruments and the validation of analytical methods. Independent evaluation for the intended use of this material should be conducted by the user.

Instructions for Use

1. The test surface is on the opposite side of the labeled surface, which includes the material identification. The entire thickness of the unit is certified. However, the user is cautioned not to measure disks less than 2 mm thick when using X-ray fluorescence spectrometry. Each packaged disk has been prepared by finishing the test surface using a lathe. The user must determine the correct surface preparation procedure for each analytical technique. The user is cautioned to use care when either resurfacing the disk or performing additional polishing, as these processes may contaminate the surface.
2. The material should be stored in a cool, dry location when not in use.

Analytical Reference Materials International • 276 Abby Road • Manchester, NH 03103
Telephone (603) 935-4100 • Fax (603) 935-4101 • www.ARMIL.com • ARMI@LGCgroup.com

IARM-35NN-F
6/30/2020 1/2

INTERNATIONAL
INSPECTION

PMI Procedure: II-54
PMI Instrument: Thermo Scientific Niton XL2 980
Instrument S/N# 112678
Tech: D. Rosian



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INSTALLATION & MAINTENANCE

Valve: 150# TLOK

Flange Bolting: See bolt/torque chart

DESCRIPTION:

The FV-150 T-LOK is a fabricated knife-gate valve. It has two body liners and a seat all made of Teflon or UHMW. It is a bi-directional flow valve and can be installed inline facing either direction. Multiple rows of packing are used to seal the gate outside the flow area. The pressure rating of the FV-150 T-LOK is 150# - 150 CWP (cold working pressure). The Manufacturer will provide test reports with shipment

SHIPPING & STORAGE:

All valves are normally shipped in the "closed" position. Small valves (2" – 6") may be packaged in individual boxes. Larger valves and large quantities will be packaged on pallets, skids, or in boxes and will require a forklift, or appropriate machine, for moving. Storage should be a clean dry environment, such as a warehouse.

INSTALLATION:

Install the valve to the mating pipe flange using proper fastener size and length. Thread size will be provided with each valve. If fasteners are not included in the ordered shipment, customer/installer will need to obtain proper fasteners themselves and must measure the valve and flanges to ensure correct length. Studs and nuts should be used when possible to make fitting easier. Be careful not to bottom-out fasteners in the chest during installation as that area is usually a pressure boundary and can be adversely affected if stress is applied from fasteners. Washers should be used to help shorten the penetration of bolts in the chest holes when needed. (Reference Flange Installation Instructions)

Torque charts can be referenced for the mating flange fasteners in the installation process but will vary according to gasket type, size, and thickness used. Use the cross-torque pattern method for tightening the fasteners. Mating flanges must be parallel and true with each other and the valve. Do not use the valve to pull together or push apart the two mating pipes. After installation, open and close the valve to assure smooth operation.



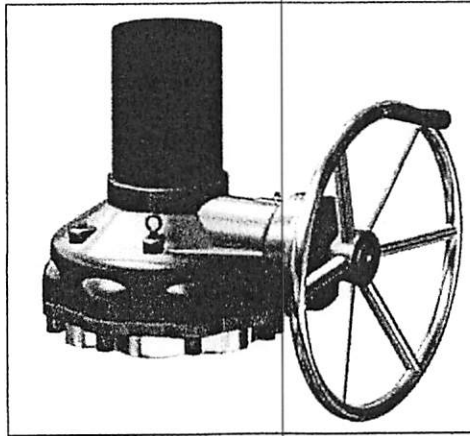
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MAINTENANCE:

The only item requiring maintenance/adjustment on the knife-gate valve is the packing. After shipment and installation, the packing gland may require adjustment to stop any leaks, especially if the valve has been in storage for a long period of time. When adjusting the packing gland fasteners, it is best to move along both sides of the gland to ensure even adjustment. To stop a leak, normally just a small amount of tightening per fastener is required. Do not tighten fasteners more than is necessary to stop the leak.

Valve Size	Bolt Size	Torque FT. lbs.
2"-4"	5/8"-11 UNC	55 (+/-5)
6"-8"	3/4"-10 UNC	65 (+/-5)
10"-12"	7/8"-9 UNC	110 (+/-10)
14"-16"	1"-8 UNC	135 (+/-10)
18"-20"	1-1/8"-8 UNC	150 (+/-10)
24"-30"	1-1/4"-8 UNC	200 (+/-10)
32"-48"	1-1/2"-8 UNC	250 (+/-10)

SAMBO INDUSTRIAL BEVEL GEAR OPERATORS



BEVEL GEAR BOX

* MATERIAL & FEATURE

1) MATERIAL

HOUSING	Ductile Iron or WCB
BASE	Ductile Iron or WCB
END CAP	Ductile Iron or WCB
PINION	SCM440
BEVEL GEAR	SCM4
DRIVE SLEEVE	A105
STEM CAP	A36
LOCK NUT	A105

2) FEATURE

We have two kinds of manual bevel gear operator type, one is bevel gear and the other is be helical gear. The latter was bevel-spur gear. It has been changed helical gear, because of so rotating among the spur gears.

GENERAL TYPE ----- SB-VS10 SB-V8 (USED BEVEL GEAR)

SUPPORT BOX TYPE-1 - SB-V3-1 SB-V8-1 (USED BEVEL- HELICAL GEAR)

SUPPORT BOX TYPE-2 - SBV2-20 SBV8-20 (USED BEVEL- BEVEL GEAR)

SUPPORT BOX TYPE-3 - SBV2-20-1 SBV8-20-1 (USED BEVEL- BEVEL-BEVEL GEAR)

INSTALLATION

1) Mounting to valve

If the bevel gear operator has been supplied with a hand-wheel, it is recommended that it is fitted to the gearbox before mounting on the valves. About that, be careful the P.C. and tap size of gear box base.

2) Maintenance

Under normal operating conditions no maintenance is required for the bevel gear operator but should the valve be taken out of service for overhaul, the bevel gear operator baseplate may be removed and the grease changed using one of the following recommended lubricants.

Manufacturer : Yong Kang CO.,LTD

Name : Grease (GRANT SUPER GREASE)

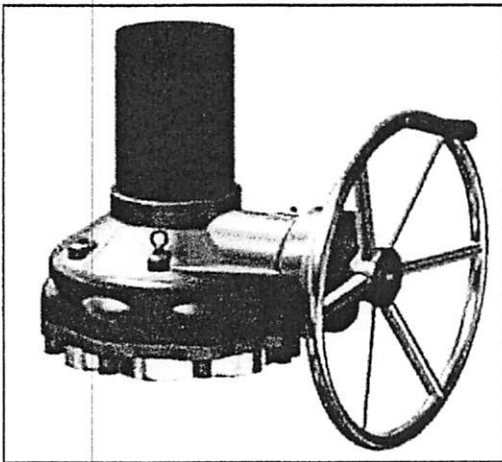
Temperature Range : -4°F □ 284°F (-20°C □ +140°C)

DEVICE OF OPERATION

1) **HAND WHEEL** : Hand-wheel can be located in quadrant, giving you good adaptability. You can install very easily, attach the wheel to the pinion, and a nut a screw.

2) **ACTUATOR** : If you would like to increase RPM, you may use an actuator.

3) **CHAIN WHEEL** : Overhead or inaccessible valves, when equipped with this device may be conveniently and safely operated from the floor.

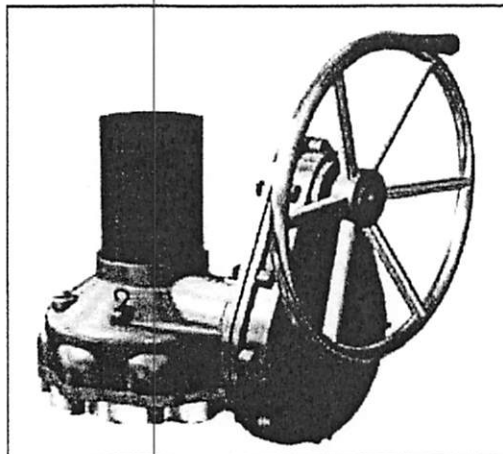


GENERAL TYPE-HORIZONTAL
TYPE-1 Stair

Specifications

- SB-VS10~SB-VS20
- SB-V0~SB-V2
- SB-V3~SB-V5

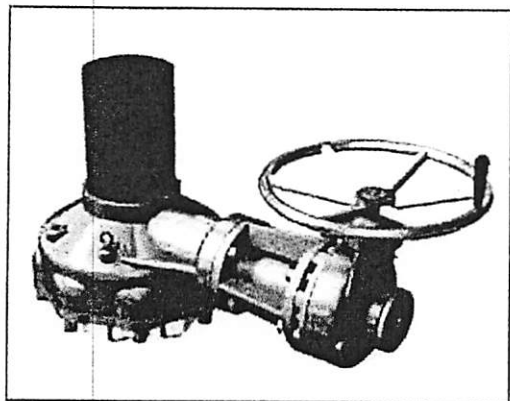
- SB-V6~SB-V8



SUPPORT BOX TYPE HORIZONTAL
TYPE - 2 Stairs

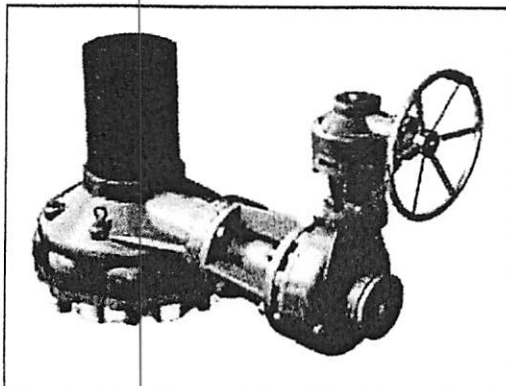
Specifications

- SB-V3-1~SB-V6-1
- SB-V7-1~SB-V8-1



SUPPORT BOX TYPE VERTICAL
TYPE - 2 Stairs

Specifications
- SBV2~20~SBV8~20



SUPPORT BOX TYPE HORIZZONTAL
TYPE - 3 Stairs

Specifications
SBV2~20-1~SBV8~20-1

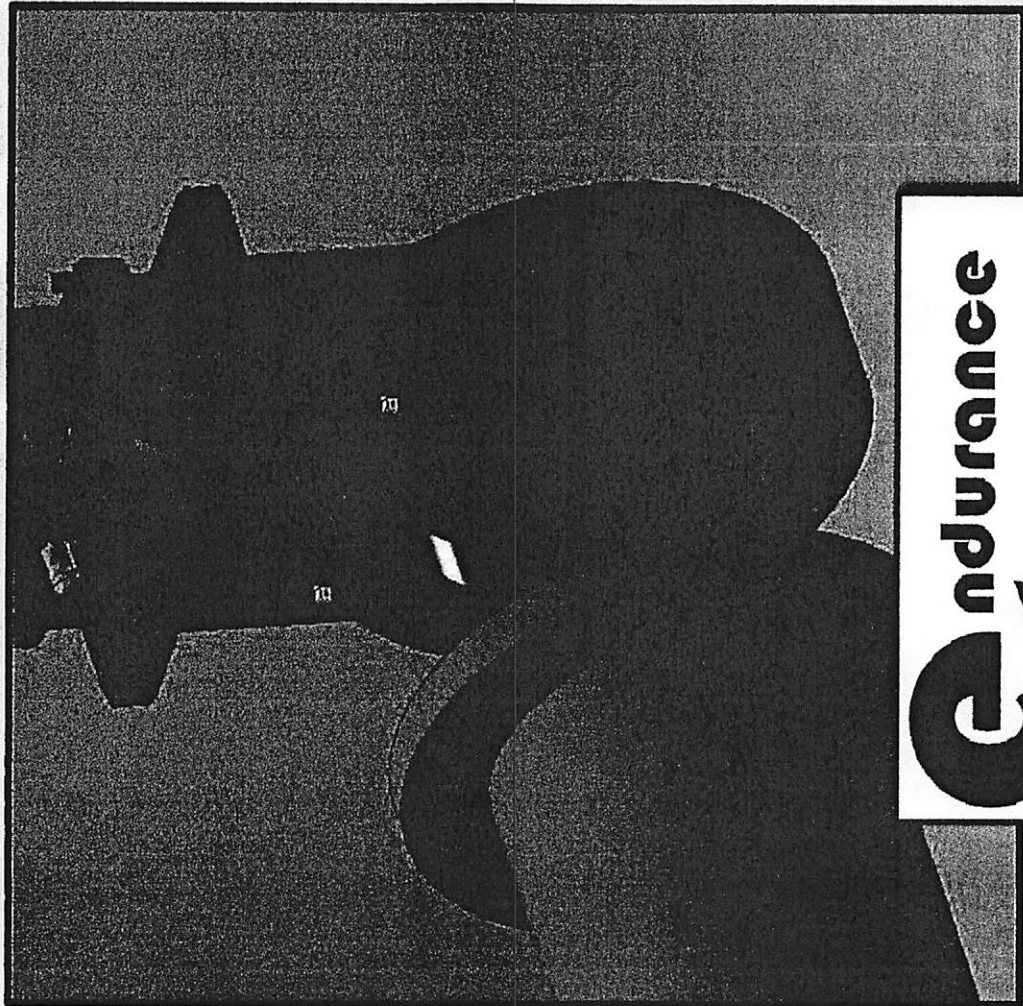
BOLTING STUDS TO VALVE-PIPING

Engineering



STEP 1

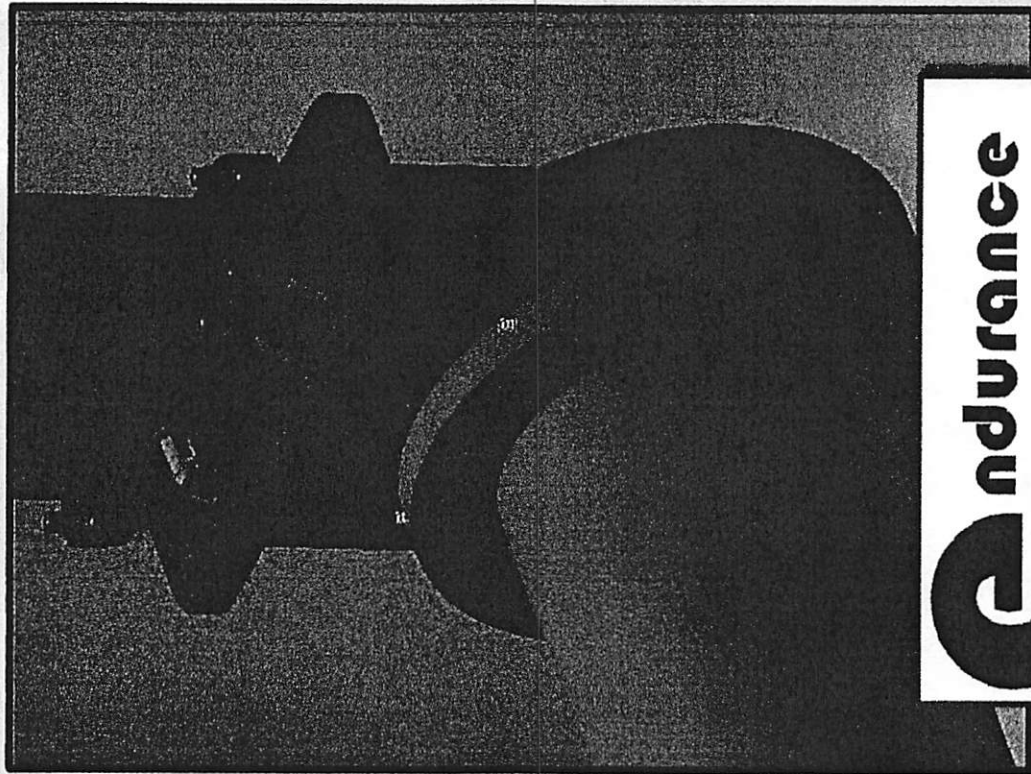
- Begin with 2 studs threaded into the valve next to each other



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STEP 2

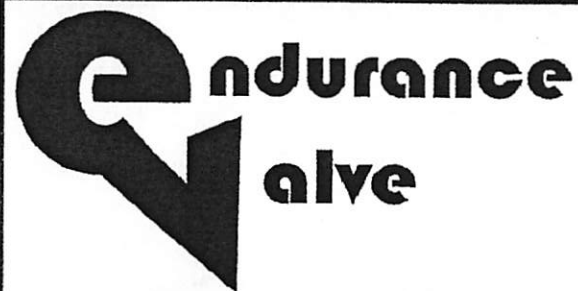
- Line-up to piping and slide flush to pipe and hand snug nuts w/washer



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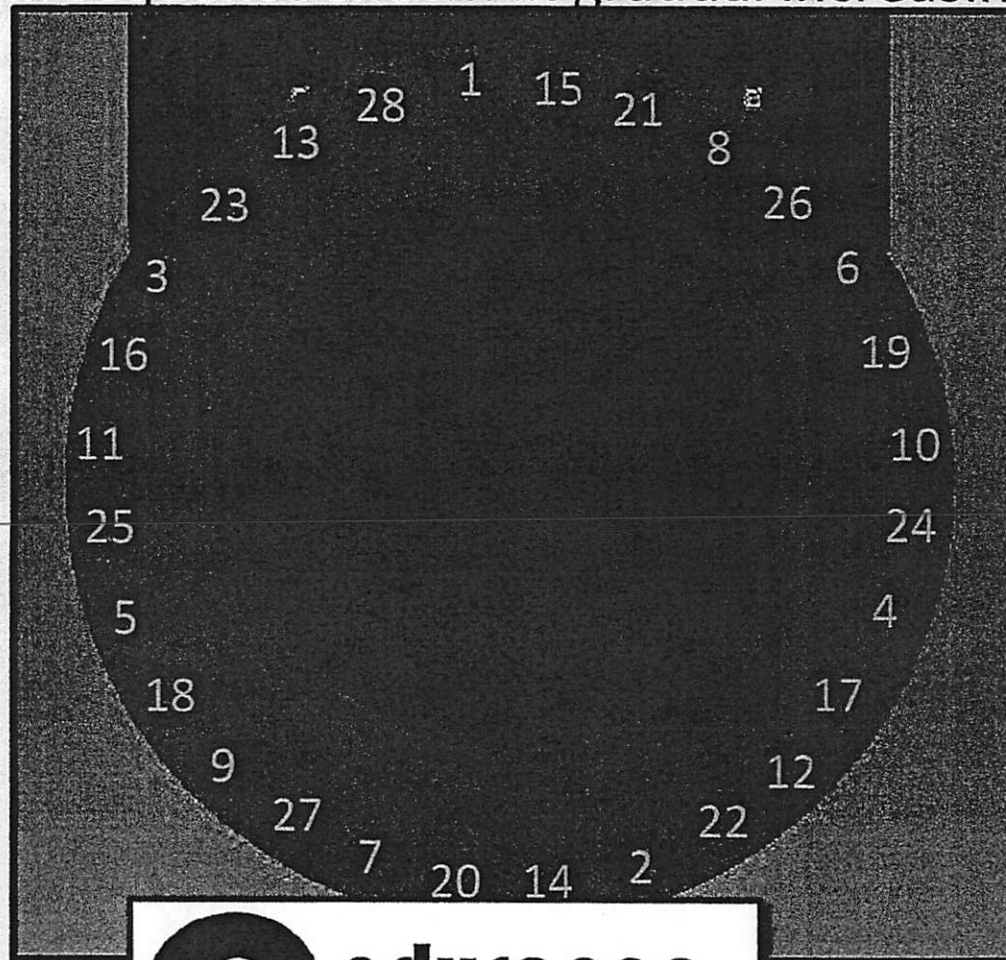
STEP 3

- Thread a nut $\frac{3}{4}$ of the way down another stud.
- Thread a 2nd nut down to the 1st nut.
- Place a washer on the longest side of the stud
- Thread stud by hand into the valve snug and remove upper nut
- Loosen nut and thread remaining stud into valve



STEP 4

- Thread remaining studs and nuts into valve hand snug
- Then torque* in sequence shown in gradual increasing torque.



*torque sequence changes per valve size

