



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-A516FP/TFE/304FP-17.4FP-WRFP-BG-FB-X
Ref Job #	13800 Item #1
P.O.:	P.O. 4503148039
Serial #'s	229551-1

Tag #'s	Tag: 93SP-2140
---------	----------------

CRN: 0C10259.2	
Weight:	310 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:	13800 Item #1
Model Number:	FV-10-300-150FF-TL-A516FP/TFE/304FP-17.4FP- WRFP-BG-FB-X
Serial #:	229551-1

Customer PO

P.O. 4503148039

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

310^{lbs}

229551-1

10"

Fabricast Valve Manufacturers ID: 2202955

FV-10-300-150FF-TL-A516FP/TFE/304FP-17.4FP-WRFP-BG-FB-X

P.O. 4503148039 / 3500007374

93SP-2140

13800

300^{PSI}

400°F

421643

A516Gr70

17.4^{SS}

PTFE



Strive for Excellence

JAR-015		Hydrostatic Test Report			
Issued by: HR		Effective Date: 8/16/2022		Rev. C	Pg. 1 of 1
APPROVED: 8/16/2022 11:00 AM - Stosh Zydek					
					
Testing Procedure and Process					
Valve Description	FV-10-300-150FF-TL-A516FP/TFE/304FP-17.4FP-WRFP-BG-FB-X				
Serial Number	229551-1	Ref. #	13800	Item #1	Size 10
Tag Number	Tag: 93SP-2140		Design Pressure Body PSI/CWP		300
Wetted Parts	17.4ss	Flange Material	A516Gr70	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	Nicholas Hicks - Nicholas Hicks				Date 8-30-22
Source Inspector					Date
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	Lyman Alford - Lyman Alford				Date 8/30/22
Source Inspector					Date
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	Nicholas Hicks - Nicholas Hicks				Date 8-30-22
Source Inspector					Date

3/16 A36

540798

EVRAZ
EVRAZ INC. NA

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

Form TCI: Revision 2: Date 13 Feb 2017

Test Certificate

Customer: VARSTEEL LTD. 330-220 4TH STREET LETHBRIDGE AB T1A4T7		Customer P.O. No.: DCTL-863		Mill Order No.: 41-25872144		Shipping Manifest: RT127215										
Product Description: CSA G40.21(2018)/44/300/59W/ASIM A36(19) A709(01A)36/ASME SA36(01ED) CSA G40.21(2018)300W/260W		Ship Date: 04 Nov 21		Cert No: 071111472		Cert Date: 04 Nov 21 (Page 1 of 1)										
Size (Min): 0.178 X 60.00 X COIL (IN)																
Tested Pieces		Tensiles		Charpy Impact Tests												
Heat Id	Piece Id	Piece Dimensions	Tst Loc (PSI)	YS (PSI)	UTS (PSI)	%RA Elong 2in 8in Dir	Average Hardness	Abs. Energy (FTLB) 1 2 3 Avg	% Shear 1 2 3 Avg	Tst Temp (mm)	BDWTT Temp & Str					
540798	C00005	0.308 X 60.00	L 56000	70000	73000	38	↑									
540798	C00006	0.183 X 60.00	L 63000	73000		35	↑									
Heat Analysis																
Heat Id	C	Mn	P	S	Si	Total Al	Ca	Ni	Cr	Mo	V	Ti	B	N	CEV	Melted in CAN
540798	.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																
PCES: 1, WGT: 46780																
540798 C00009																
Cust Practice: WE HEREBY CERTIFY THAT THIS MATERIAL WAS TESTED IN ACCORDANCE WITH THE APPROPRIATE SPECIFICATION																
Approved By: Kendal Dunnett Quality Representative																

Wrap (Body)

Warehouse Transfer

From Delta Varsteel to Corporate C

Customer Name

VARSTEEL LTD. - DELTA (INTERC)

Customer PO#

DE-1072731

Shipper No

17288

Heat Number

540798

Transfer No

233606

Heat Number

540798

posco

Order No. : 01S5007244

Supplier : POSCO INTERNATIONAL CORPORATION

Customer : CASCADIA METALS INC.

Mill Test Certificate

PO No. : 2107-47995

Commodity : HR COIL (47995)

Spec & Type : ASTM A36

Certificate No. : 210715-FH01KS-0008A1-0010

Date of Issue : Jul., 21, 2021

Size	Product No.	Quantity	Weight (kg) (lb)	Heat No.	Country of Melt & Pour	Position	Tensile Test			Division	Chemical Composition												
							YP (IP)	TS	EL (%)		C (%)	Si (%)	Mn (%)	P (%)	S (%)	Cr (%)	Ni (%)	Cu (%)	Mo (%)	Nb (%)	V (%)	Se-Al (%)	
7.94x1219xC	HTT065710	1	15,850 34,502	SP95784	KOR	B	299	482	33	L	0.1929	0.007	0.845	0.0119	0.0050	0.023	0.017	0.032	0.003	0.001	0.000	0.024	
										P	0.1975	0.007		0.0113	0.0051	0.023	0.016	0.031	0.003	0.001	0.000	0.024	
7.94x1219xC	HRT098470	1	18,760 41,358	SQ69354	KOR	B	308	480	37	L	0.1830	0.005	0.794	0.0102	0.0033	0.015	0.012	0.020	0.003	0.001	0.000	0.032	
										P	0.1826	0.004		0.0103	0.0031	0.014	0.011	0.017	0.003	0.001	0.001	0.032	
7.94x1219xC	HRT098480	1	18,900 41,667	SQ69354	KOR	B	307	477	35	L	0.1830	0.005	0.794	0.0102	0.0033	0.015	0.012	0.020	0.003	0.001	0.000	0.032	
										P	0.1826	0.004		0.0103	0.0031	0.014	0.011	0.017	0.003	0.001	0.001	0.032	
7.94x1219xC	HRT098490	1	18,870 41,601	SQ69356	KOR	B	298	474	35	L	0.1737	0.004	0.786	0.0097	0.0050	0.012	0.012	0.017	0.003	0.001	0.000	0.027	
										P	0.1811	0.007		0.0109	0.0039	0.014	0.013	0.016	0.003	0.001	0.001	0.028	
7.94x1219xC	HRT098500	1	18,880 41,623	SQ69356	KOR	B	301	475	37	L	0.1737	0.004	0.786	0.0097	0.0050	0.012	0.012	0.017	0.003	0.001	0.000	0.027	
										P	0.1811	0.007		0.0109	0.0039	0.014	0.013	0.016	0.003	0.001	0.001	0.028	
*** Sub Total (010) ***		5	91,060 (kg)	200,751 (lb)																			
7.94x1524xC	HRT0752701	1	16,980 37,434	SQ69089	KOR	B	322	494	36	L	0.1769	0.005	0.785	0.0108	0.0033	0.018	0.015	0.036	0.003	0.000	0.001	0.030	
										P	0.1751	0.007		0.0103	0.0031	0.018	0.016	0.032	0.004	0.000	0.002	0.029	
7.94x1524xC	HRT0752702	1	16,330 36,001	SQ69089	KOR	B	322	494	36	L	0.1769	0.005	0.785	0.0108	0.0033	0.018	0.015	0.036	0.003	0.000	0.001	0.030	
										P	0.1751	0.007		0.0103	0.0031	0.018	0.016	0.032	0.004	0.000	0.002	0.029	
7.94x1524xC	HRT0805901	1	16,940 37,346	SQ69089	KOR	B	312	488	30	L	0.1769	0.005	0.785	0.0108	0.0033	0.018	0.015	0.036	0.003	0.000	0.001	0.030	
										P	0.1751	0.007		0.0103	0.0031	0.018	0.016	0.032	0.004	0.000	0.002	0.029	
7.94x1524xC	HRT0805902	1	16,500 36,376	SQ69089	KOR	B	312	488	30	L	0.1769	0.005	0.785	0.0108	0.0033	0.018	0.015	0.036	0.003	0.000	0.001	0.030	
										P	0.1751	0.007		0.0103	0.0031	0.018	0.016	0.032	0.004	0.000	0.002	0.029	
7.94x1524xC	HRT0806001	1	17,000 37,478	SQ69089	KOR	B	312	488	30	L	0.1769	0.005	0.785	0.0108	0.0033	0.018	0.015	0.036	0.003	0.000	0.001	0.030	
										P	0.1751	0.007		0.0103	0.0031	0.018	0.016	0.032	0.004	0.000	0.002	0.029	
7.94x1524xC	HRT0806002	1	16,710 36,839	SQ69089	KOR	B	312	488	30	L	0.1769	0.005	0.785	0.0108	0.0033	0.018	0.015	0.036	0.003	0.000	0.001	0.030	
										P	0.1751	0.007		0.0103	0.0031	0.018	0.016	0.032	0.004	0.000	0.002	0.029	
*** Sub Total (020) ***		6	100,460 (kg)	221,474 (lb)																			
6.17x1524xC	HPT1189001	1	17,190 37,897	SP95693	KOR	B	296	458	34	L	0.1507	0.006	0.687	0.0114	0.0048	0.022	0.017	0.026	0.003	0.001	0.001	0.025	
										P	0.1495	0.004		0.0117	0.0044	0.023	0.016	0.024	0.003	0.001	0.001	0.022	

* Position - T : Top, M : Middle, B : Bottom
 * Tensile Test Direction : Transversal, Gauge Length : 50 mm (Rectangular),
 YP Method : Upper Point
 * Division - L : Ladle Analysis, P : Products Analysis

We hereby certify that the material herein has been made in accordance with the order and is fully in compliance.
 This material has been fully killed and made by basic oxygen process.
 Test Certificate is issued according to ISO 10474/EN 10204 3.1.

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

Surveyor To :

POSCO

Gwangyang Works, 20-26, Pokposarang-gil, Gwangyang-si, Jeollanam-do, 57807, Korea

< PAGE : 10 >

Chief of material testing section

KO JAE GON

Stuffer Sides

5/16 A36 SQ 69089

KO JAE GON

JARSTEEL LTD. - DELTA (INTERC) DE-1072988

Shipper No

17351

421037

EVERAZ

EVRAZ INC. NA

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

Test Certificate

Form TCI: Revision 2: Date 13 Feb 2017

25A

73/21

Customer:		Customer P.O. No.: CTL-867		MHI Order No.: 41-25804-08		Shipping Manifest: RT126390	
YARSTEEL LTD 330-220 4TH STREET LETHBRIDGE AB T1J4J7		Product Description: CSA G40.21(2018/44/300)38W/ASIM A36(19) A709(01)A36/ASME SA36(01ED) CSA G40.21(2004)260W		Ship Date: 12 Oct 21 Cert Date: 12 Oct 21		Cert No: 071110649 (Page 1 of 1)	
		Size (Min): 0.490 X 60.00 X COIL (IN)					
Tested Pieces				Charpy Impact Tests			
Heat Id	Piece Id	Piece Dimensions	Tst Loc (PSI)	Tensiles	Charpy Impact Tests		
				UTS (PSI)	%RA	Elong % Tst	Average Hardness
					2in	8in	Dir
					1 2 3 Avg		
					1 2 3 Avg		
					Tst Dir	Tst Siz (mm)	BDWTT Tmp %Sur
Heat Id				Melted In			
421037	C	.06	.54	.012	.002	.17	.048
	Ma	.012	.002	.17	.048	.26	.08
	P	.08	.09	.02	.023	.001	.001
	S	.001	.001	.0082			
	Si	CAN					
Chemical Analysis							
	Tot Al	Cu	Ni	Cr	Mo	Cb	V
	Ti	B	N				
MERCURY IS NOT A METALLURGICAL COMPONENT OF THE STEEL AND NO MERCURY WAS INTENTIONALLY ADDED DURING THE MANUFACTURE OF THIS PRODUCT. CERTIFIED TO CHEMISTRY ONLY.							
HOT-ROLLED COIL INTENDED FOR CONVERSION TO GRADE. REPORTED, ARE FOR INFORMATION ONLY.							
COIL END PHYSICAL TEST RESULTS, IF REPORTED, ARE FOR INFORMATION ONLY.							
BALANCE OF CHEMISTRY IS IRON (FE)							
MELTED AND Poured IN CANADA							
421037	A0042	PCES: 1, WGT: 42400	421037	A0043	PCES: 1, WGT: 42560		

Packign Box Sides Stuffer Ends

CU

Cust Practice:

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

Approved By: Kendal Dunnell

Quality Representative



EVRAZ INC. NA

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

REPORT OF CHEMICAL/PHYSICAL TESTS

CERTIFICATE NO.	DATE	PAGE
1809314	Jan 24, 2022	1
MILL ORDER NO.	DATE	
372904		
CUSTOMER ORDER NO.		
227314		
JOB/REQ. NO.		
SHIPPING NO.	DATE	
1809314	01/24/2022	
CARRIER		
GREEN TRANSFER		
CAR/TRUCK NO.		
28		

	SOLD TO	BRIDGE CITY STEEL 3865 NW ST HELENS RD PORTLAND, OR 97210 USA	BRIDGE CITY STEEL 3865 NW ST HELENS RD PORTLAND, OR 97210 USA

THIS MATERIAL HAS BEEN MANUFACTURED, TESTED AND FOUND TO MEET THE SPECIFICATIONS AND PURCHASE ORDER REQUIREMENTS
 EOS CARBON STRUCTURAL QUALITY PLATE ASTM A36-19/ASME SA36 2021 ASTM A709-18
 GRADE 36 FOR LASER QUALITY APPLICATIONS NO WELD REPAIR. LASER QUALITY. KILLED
 FINE GRAIN PRACTICE. AIM .03 SI, .19 C.

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
1	1.2500 X 96.000ME X 240.000 2 PCS 16336 LBS	+! RS5967		474	725	28				
2	0.7500 X 96.000ME X 240.000 4 PCS 19604 LBS	+! RS5173		625 466	800 720	23 38				
3	1.0000 X 96.000ME X 240.000 3 PCS 19602 LBS	+! RS5173		485	735	34				
	9 PCS 55542 LBS TOTALS									

CHEMICAL ANALYSIS

	HEAT NO.	C	Mn	P	S	SI	Cu	NI	V	Cb	Al	Cr	Mo	Ti	B	N	Ca		CE	McQuaid Ebn Grain Size
+!	RS5967	.18	.91	.012	.003	.03	.32	.11	.003	.001	.033	.11	.03							
+!	RS5173	.18	.87	.013	.001	.06	.33	.13	.003	.001	.054	.12	.02							
+!	RS5173	.18	.87	.013	.001	.06	.33	.13	.003	.001	.054	.12	.02							
HEATS INDICATED WITH (I) 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

Quality Systems Coordinator

BRIDGE CITY STEEL
(516) PLATE SA516 GR 70
1" X 48.0000" X 96.0000"
PART NO.

1" A516

PO/Rel 217495

N02834

Certificate of Mill Test Results
SO POR-031135-002 30Mar15
Pg 1/1

Attn:

EVRAZ EVRAZ INC. NA
Evraz Oregon Steel 14400 N. Rivergate Blvd., Portland, Oregon 97203

REPORT OF CHEMICAL/PHYSICAL TESTS

	SOLD TO	CERTIFICATE NO. 1380309 DATE Jun 19, 2014 PAGE 1	
		MILL ORDER NO. 275230 DATE	
		CUSTOMER ORDER NO. POR-4286	
		JOB/REQ. NO. FF	
		SHIPPING NO. 1380309 DATE 06/19/2014	
THIS MATERIAL HAS BEEN MANUFACTURED, TESTED AND FOUND TO MEET THE SPECIFICATIONS AND PURCHASE ORDER REQUIREMENTS CARBON PRESSURE VESSEL QUALITY ASTM A516-10 GRADE 70 ASME SA516 GRADE 70 2013 KILLED FINE GRAIN NO WELD REPAIR. PRESSURE VESSEL QUALITY. KILLED FINE GRAIN PRACTICE. ITEMS WITH (*) ALSO MEET ASTM/ASME A516 GR60. ITEMS (continued)		CARRIER GREEN TRANSFER CAR/TRUCK NO. 23	

PHYSICAL PROPERTIES

Q&N	DESCRIPTION	HEAT NO.	SLAB	YIELD PSI X 100	TENSILE PSI X 100	% ELONG 8" 2"	% RA	HARDNESS BHN	BEND TEST	IMPACTS
2	WITH (**) ALSO MEET ASTM/ASME A516 GR65. 0.5000 X 96.0000 X 480.000 2 PCS 13068 LBS (*) (**) ^ 2 PCS 13068 LBS (*) (**) ^	N02833 N02834	A28 A28	555 560	725 720	28 28				
4	1.0000 X 96.0000 X 480.000 1 PC 13068 LBS (*) (**) ^	N02834	A30	520	710	26				
	5 PCS 39204 LBS TOTALS									

CHEMICAL ANALYSIS

HEAT NO.	C	Mn	P	S	Si	Cu	Ni	V	Co	Al	Cr	Mo	Ti	B	N	Ca	CE	Micro Alloy Grain Size
N02833	14	1.05	.012	.005	28	.01	.05	.014	.021	.041	.03	.00	.003	.0000				
N02834	13	1.07	.011	.008	28	.01	.05	.016	.022	.037	.03	.00	.002	.0000				
N02834	13	1.07	.011	.008	28	.01	.05	.016	.022	.037	.03	.00	.002	.0000				

HEATS INDICATED WITH (+) WERE MELTED & MANUFACTURED IN THE USA. 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 _____

Richard Deschand Quality Coordinator

Horseshoe (Body)

BRIDGE CITY STEEL
(516) PLATE SA516 GR 70
3/4" X 96.0000" X 240.0000"
PART NO.

3/4 AS16-70 PO/Rel 226213

N22783

Certificate of Mill Test Results

SO POR-044505-001

10Mar21

Pg 1/1

Attn:

EVRAZ EVRAZ INC. NA
Evraz Oregon Steel 14400 N. Rivergate Blvd., Portland, Oregon 97203

REPORT OF CHEMICAL/PHYSICAL TESTS

	SOLD TO F 4' US	NOTE 36	42 USA	CERTIFICATE NO. 1710634	DATE Jan 13, 2020	PAGE 1
				MILL ORDER NO. 347452	DATE	
				CUSTOMER ORDER NO. POR-6412		
				JOB/REQ. NO.		
				SHIPPING NO. 1710634	DATE 01/13/2020	

THIS MATERIAL HAS BEEN MANUFACTURED, TESTED AND FOUND TO MEET THE SPECIFICATIONS AND PURCHASE ORDER REQUIREMENTS
CARBON STEEL PRESSURE VESSEL QUALITY PLATE ASTM A516-17 GRADE 70 ASME SA516
GRADE 70 2017. AS ROLLED KILLED FINE GRAIN NO WELD REPAIR. PRESSURE VESSEL
QUALITY. KILLED FINE GRAIN PRACTICE. NACE MR0175 P.2 ANNEX A (continued)

CARRIER
GREEN TRANSFER
CAR/TRUCK NO.
745

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
	COMPLIANT. REPORT ALL RESIDUALS PERS SA20 ITEMS WITH (*) ALSO MEET ASTM/ASME A516 GR65. ITEMS WITH (**) ALSO MEET ASTM/ASME A516 GR60. INSPECTION CERTIFICATE									
1	0.7500 X 96.0000E X 480.000									
	2 PCS 19602 LBS	N22783	A28	555	815	35				
	2 PCS 19602 LBS	N22787	A24	550	820	35				
	4 PCS 39204 LBS TOTALS									

CHEMICAL ANALYSIS

HEAT NO.	C	Mn	P	S	Si	Cu	Ni	V	Co	Al	Cr	Mo	Ti	B	N	Ca	CE	McQuaid Env Test Size
N22783	.20	1.34	.015	.005	.29	.01	.05	.027		.033	.02		.002					
N22783:	Cb=<0.005, Mo=<0.005, B=<0.0005																	
N22787	.20	1.30	.015	.004	.31	.01	.05	.023		.034	.03		.002					
N22787:	Cb=<0.005, Mo=<0.005, B=<0.0005																	

HEATS INDICATED WITH (+) WERE MELTED & MANUFACTURED IN THE USA. 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

Aaron Capps

Quality Coordinator

Port Flanges (Body), Gussets, Yoke Top, Yoke Pads

BRIDGE CITY STEEL
(516) PLATE SA516 GR 70
3/4" X 96.0000" X 240.0000"
PART NO.

3/4 AS16-70 PO/Rel 226213

N22783

Certificate of Mill Test Results

SO POR-044505-001

10Mar21

Pg 1/1

Attn:

EVRAZ EVRAZ INC. NA
Evraz Oregon Steel 14400 N. Rivergate Blvd., Portland, Oregon 97203

REPORT OF CHEMICAL/PHYSICAL TESTS

	SOLD TO F 4' US	NUC 96 42 USA	CERTIFICATE NO. 1710634	DATE Jan 13, 2020	PAGE 1
			MILL ORDER NO. 347452	DATE	
			CUSTOMER ORDER NO. POR-6412		
			JOB/REQ. NO.		
			SHIPPING NO. 1710634	DATE 01/13/2020	

THIS MATERIAL HAS BEEN MANUFACTURED, TESTED AND FOUND TO MEET THE SPECIFICATIONS AND PURCHASE ORDER REQUIREMENTS
CARBON STEEL PRESSURE VESSEL QUALITY PLATE ASTM A516-17 GRADE 70 ASME SA516
GRADE 70 2017, AS ROLLED KILLED FINE GRAIN NO WELD REPAIR. PRESSURE VESSEL
QUALITY. KILLED FINE GRAIN PRACTICE. NACE MR0175 P.2 ANNEX A (continued)

CARRIER
GREEN TRANSFER
CAR/TRUCK NO.
745

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
	COMPLIANT. REPORT ALL RESIDUALS PER SA20 ITEMS WITH (*) ALSO MEET ASTM/ASME A516 GR65. ITEMS WITH (**) ALSO MEET ASTM/ASME A516 GR60. INSPECTION CERTIFICATE 3.1 EN10204 :2004 DIN 50049 3.1.B.									
1	0.7500 X 96.0000E X 480.000									
	2 PCS 19602 LBS	N22783	A28	555	815	35				
	2 PCS 19602 LBS	N22787	A24	550	820	35				
	4 PCS 39204 LBS TOTALS									

CHEMICAL ANALYSIS

HEAT NO.	C	Mn	P	S	Si	Cu	Ni	V	Co	Al	Cr	Mo	Ti	B	N	Ca			CE	McQuaid Etn Chem Lab
N22783	.20	1.34	.015	.005	.29	.01	.05	.027		.033	.02		.002							
N22783:	Cb=<0.005, Mo=<0.005, B=<0.0005																			
N22787	.20	1.30	.015	.004	.31	.01	.05	.023		.034	.03		.002							
N22787:	Cb=<0.005, Mo=<0.005, B=<0.0005																			
HEATS INDICATED WITH (+) WERE MELTED & MANUFACTURED IN THE USA. 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

Aaron Capps
Quality Coordinator

Port Flanges (Body), Gussets, Yoke Top, Yoke Pads



運錫鋼鐵股份有限公司
YUEN CHANG STAINLESS STEEL CO., LTD.
Y C S S

Wear Ring Mid

檢驗證明書

高雄市前金區中正四路 235 號 13F
13F, No. 235 Jungjeng 4th Road, Chianjin
Chiu, Kaohsiung, Taiwan
TEL : 886-7-9695858 FAX : 886-7-9685768
https://www.yuenchang.com.tw

Certificate No. : 11006080006

MILL TEST / QUALITY CONTROL CERTIFICATES

列印日期 ISSUE DATE : 2021/06/08

客戶名稱 Customer	Central National Canada ULC 38 Ancon Road WoodBridge, Ontario L4H 2A9, Canada					Invoice NO. : QEP574/21 PI NO. : IN21062 PO NO. : OP6067961
商品描述 Desc. Of Goods	Prime Cold Rolled Stainless Steel Sheets, Slit Edge, AS PER ASTM A-240/ASME SA-240 ASTM A-480/ASME SA-480					
項目 Item	鋼捲編號 Coil No.	爐號 A Unique Heat Number	鋼種 Steel Grade	表面 Finish	產品尺寸 Thickness x Width x Length	淨重 Net Weight (KGS)
IE006	02S35247-021	YU195151	304/304L	2B	16GA x 60IN x 120IN	1,636
IE007	02S35247-022	YU195151	304/304L	2B	16GA x 60IN x 120IN	1,635
IE008	9Y774L01-020	9Y774	304/304L	2B	14GA x 60IN x 120IN	1,719
IE001	9Y400L04-016	9Y400	304/304L	2B	12GA x 60IN x 120IN	1,731
IE003	9Y400L04-028	9Y400	304/304L	2B	12GA x 60IN x 120IN	1,732
IE005	9Y400L04-029	9Y400	304/304L	2B	12GA x 60IN x 120IN	1,731
IE002	05S41947-019	YU495874	304/304L	2B	11GA x 60IN x 120IN	1,746
IE004	05S41947-024	YU495874	304/304L	2B	11GA x 60IN x 120IN	1,745

化學成份 Actual Mill Chemical

Item	C	Si	Mn	P	S	Cr	Ni	Cu	N	Mo
IE006	0.0190	0.34	0.80	0.036	0.0030	18.18	8.05	0.46	0.0580	0.29
IE007	0.0190	0.34	0.80	0.036	0.0030	18.18	8.05	0.46	0.0580	0.29
IE008	0.0200	0.40	1.40	0.034	0.0020	18.09	8.02	0.05	0.0550	0.04
IE001	0.0270	0.40	1.24	0.032	0.0013	18.28	8.05	0.04	0.0680	0.04
IE003	0.0270	0.40	1.24	0.032	0.0013	18.28	8.05	0.04	0.0680	0.04
IE005	0.0270	0.40	1.24	0.032	0.0013	18.28	8.05	0.04	0.0680	0.04
IE002	0.0230	0.34	0.87	0.030	0.0100	18.25	8.14	0.19	0.0430	0.06
IE004	0.0230	0.34	0.87	0.030	0.0100	18.25	8.14	0.19	0.0430	0.06

機械性質 Mechanical Property Test Reports

Item	T.S N/MM2	Y.S(0.2%) N/MM2	Elong A50(%)	HRBW	HRB
IE006	643	313	55.0		84.0
IE007	643	313	55.0		84.0
IE008	662	287	53.0	83.0	
IE001	633	307	56.0	84.0	
IE003	633	307	56.0	84.0	
IE005	633	307	56.0	84.0	
IE002	668	337	50.0	88.0	
IE004	668	337	50.0	88.0	

QC ACCEPTED

DATE 10-19-21

WFLS

Authorized Signature

QC Manager

David Wang

茲證明本廠所製產品，均依材料規格製造及試驗，並符合規格之要求。

We hereby certify that the products described herein have been manufactured and tested with satisfactory results in accordance with the requirement of the above material specification.

本廠產品無輻射污染，並且不含汞。The material described above is free from radiation contamination and mercury.

除訂單特別註明，鋼板正面或鋼捲外側表面被視為主要表面。Unless specified on the order, the main side of sheets and plates, or the outside surface of coils and



NORTH AMERICAN
STAINLESS

METALLURGICAL TEST REPORT

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

Certificate: 732688 01 Mail To:
Customer: 5623 026 C/O TSA

325 S. ROUTE 31 - SUITE G103 BUILDING G
MONTGOMERY, IL 60538

Ship To:
SAMUEL, SON & CO., INC.
C/O TSA
325 S. ROUTE 31 - SUITE G103 BUILDING G
MONTGOMERY, IL 60538

Date: 10/22/2021 Page: 1

Steel: 304/304L

Finish: HRAP

Corrosion: ASTM A262/15/180Bend-OK

Your Order: 041S-7470154

NAS Order: AN 0957691 03

PRODUCT DESCRIPTION:

STAINLESS STEEL COIL, HRAP; UNS 30400/30403
ASTM A240/20a, A480/20a, A666/15; ASME SA240/19, SA480/19, SA666/19
CHEM ONLY ON FOLLOWING ASME: A276/17, A479/20, A484/20b, A312/21
CHEM ONLY ON FOLLOWING ASME: SA312/19, SA479/19
AMS 5511K/5513J XMRK; MIL-8-5059D AMD3 (X CRN MEAS); MIL-4043B
NACE MR0175/ISO 15156-3:2015 A, MR0103/07; QCS766D-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 DEFARS Compliant

Product ID #	Coil #	Thickness	Width	Weight	Length	Mark	Pieces
01P22E E	* 01P22E E	.2500	60.0000	10,490	COIL	203.40	14

ANAB, ISO/IEC 17025, Certificate# 12323
Chemical Analysis per ASTM A751/20

HEAT	CM	C %	CR %	CU %	MN %	MO %	N %	NI %	P %	S %
P22E	US	.0143	18.0130	.4365	1.7415	.3830	.0734	8.0815	.0305	.0017
SI %										
.3515										

MECHANICAL PROPERTIES

Product ID #	Coil #	UTS	20C	.2% YS	20C ELONG	% Hard	Tail	A 262 'E'
01P22E E	01P22E E	P T	93.78	52.06	48.67	87.50	88.50	OK

652909

QC ACCEPTED
DATE 10/28/21
INTLS - MZ

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

10/22/2021

Wear Ring Face

1/4

SS

304L

P22E

Gate MTR



Rolled Alloys Inc.
125 W. Sterns Road Temperance, MI 48182
United States of America
Tel: 1-800-521-0332
Fax: 734-847-6917

Sales Order # 4257905-TEM-1
Customer PO #: 211214COGS

Certificate of Conformance

Sold To:

FABRICAST VALVE
1061 INDUSTRIAL WAY
LONGVIEW, WA 98632
United States of America

Ship To:

BRIDGE CITY STEEL
3865 NW ST HELENS ROAD
PORTLAND, OR 97210
United States of America

In #	Item Description Dimensions	Specifications	Quantity	Mill Country of Origin	Heat # Tracer #
1	3/8" PLATE 17-4 48.0 x 96.0 in Plate Saw Cut Rectangle	Specs: See Test Report	1 pcs 528 lb	ATI SPECIALTY ROLLED PRODUCTS (Flat) United States of America	862403 0635195US
2	1/2" PLATE 17-4 48.0 x 96.0 in Plate Saw Random	Specs: See Test Report	1 pcs 693 lb	Gautier Specialty Metals United States of America	S8491-01-T1 0634814US

We hereby certify that the material supplied by Rolled Alloys on the above referenced purchase order was processed in accordance with the quality assurance program and procedures approved under our ISO 9001:2015/AS9100D certificate. The material was produced in compliance with the following revisions of our Quality Manual: Rev. G 5/10/2021. Our records indicate that the material and test report(s) meet the requirements of EN 10204 for a Type 3.1 inspection certificate, and meet the requirements of the purchase order and applicable specifications. The certifications provided for the Tracer numbers above are authentic and true to the original document. Rolled Alloys QMS includes mechanisms and process controls for the prevention of counterfeit parts. Required documentation is on file, and is available for review upon request. The recording of false, fictitious or fraudulent statements or entries on this document may be punishable as a felony under federal statute. Unless otherwise specified, the materials supplied with this order did not come into known contact with mercury or other low melting point elements, radioactive materials, Polychlorinated Biphenyls (PCBs), nor undergo any weld repairs while under Rolled Alloys possession. (No mercury was used in the manufacturing of this product.) Rolled Alloys complies with the applicable requirements of the 2010 Dodd Frank Wall Street Reform and Consumer Protection Act, concerning Conflict Minerals. When applicable, Rolled Alloys complies with the requirements of AS6279 Standard Practice for Production, Distribution, and Procurement of Metal Stock. Products supplied by Rolled Alloys are compliant with EU Directive 2011/65/EU and 2015/863 (RoHS3). These articles have no intended release as outlined in the European Chemical Agency's Guidance on requirements for substances in articles (RIP 3.8), and there is no obligation to register them under REACH. Safety Data Sheets (SDS), formerly known as Material Safety Data Sheets (MSDS), are available at www.RolledAlloys.com. Products supplied by Rolled Alloys do not contain any significant amounts (does not exceed 0.1 Wt%) of the chemical compounds on the EU Candidate List of Substances of Very High Concern (SVHC).

Josh Messerole
Director of Quality

January 7, 2022

Date



Rolled Alloys Inc.
125 W. Sterns Road
Temperance, MI 48182
United States of America

Tel: 1-800-521-0332
Fax: 734-847-6917

Packing List

Shipment # 1129934SUS
Shipment Date 1/7/22
Customer # 3030653



Sold To:

FABRICAST VALVE
1061 INDUSTRIAL WAY
LONGVIEW, WA 98632
United States of America
360-425-0306

Shipped To:

BRIDGE CITY STEEL
3865 NW ST HELENS ROAD
PORTLAND, OR 97210
United States of America

Purchase Order #		Freight				Shipping Via	Salesperson
Sales Order #							
211214COGS		Prepaid				R & L Carriers	Andy Yun
4257905-TEM-1							
Line #	Order Qty	Ship Qty	Bill Qty	Weight	Backorder Qty	Description	
1	1.00 pcs	528.077 lb	1.00 pcs	528 lb	0.00 pcs	3/8" PLATE 17-4 Plate Saw Specs: See Test Report 48.0" x 96.0" 1 PCS Heat: 862403 Tracer: 0635195US Mill:ATI SPECIALTY ROLLED PRODUCTS (Flat)	
2	1.00 pcs	693.043 lb	1.00 pcs	693 lb	0.00 pcs	1/2" PLATE 17-4 Plate Saw Specs: See Test Report 48.0" x 96.0" 1 PCS Heat: S8491-01-T1 Tracer: 0634814US Mill:Gautier Specialty Metals	

These items are controlled by the U.S. Government and authorized for export only to the country of ultimate destination for use by the ultimate consignee or end-user(s) herein identified. They may not be resold, transferred, or otherwise disposed of, to any other country or to any person other than the authorized ultimate consignee or end-user(s), either in their original form or after being incorporated into other items, without first obtaining approval from the U.S. Government or as otherwise authorized by U.S. law and regulations.

THE RECORDING OF FALSE, FICTITIOUS OR FRAUDULENT STATEMENTS OR ENTRIES ON THIS DOCUMENT MAY BE PUNISHABLE AS A FELONY UNDER FEDERAL STATUTE.

ALL ITEMS SUBJECT TO PRIOR SALE PLUS APPLICABLE TAXES. PO TERMS & CONDITIONS ACKNOWLEDGED, ROLLED ALLOYS STANDARD TERMS AND CONDITIONS APPLY.

THIS INFORMATION IS AVAILABLE AT WWW.ROLLEDALLOYS.COM OR CONTACT YOUR REPRESENTATIVE.

Package#	Location	Size	Type	Gross Weight
1264553PUS	floor	96"X48"X6"	PAL	642 L
1264656PUS	123	96"X48"X8"	PAL	838 L

 ATI Flat Rolled Products 500 Green Street Washington, PA 15301	Certificate of Test		 Moreen DeFerrari - Sr. Manager, Quality
	Mill Information		Customer Information
	Cert Number 0220738-01 Sales Order 50-091-189 Cert Date Oct-26-2021	Name ROLLED ALLOYS INC PO 0200638-TEM PO Date Sep-14-2021	

Sold to: ROLLED ALLOYS INC PO BOX 310 TEMPERANCE, MI 48182	Ship to: ROLLED ALLOYS INC. 125 WEST STERNS ROAD TEMPERANCE, MI 48182
---	--

Material Information

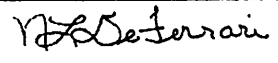
"ATI 17-4" PRECIPITATION HARDENABLE STAINLESS STEEL TRACER # <u>Below</u> PMP HOT ROLLED PLATE ANNEALED PICKLED COMMERCIAL CUT EDGE	
AMS 5604J CND A/H900 S-SPEC-1, S-1000 DATED 03/30/21 ASME-SA-693-19 CND A/H900 ASQR-01 REV 11	ASTM-A-693-16 S17400 CND A/H900 S-SPEC-35 S-400 DATED 8-1-19 UNS S17400

Piece Information

	Gauge	Width	Length					Total Wt
Pcs	(in)	(in)	(in)	Heat #	Piece ID	Section Id	Lot #	(lbs)
Item: 003	Cust-Id: 0008519			Govt-Contract-#:		Govt-DO-Rating:		
	Cust-Job:			ScheduleB:				
1	.3750	84.0000	260.0000	862403	CG26083	Th 0635194	506920	2502
1	.3750	84.0000	256.0000	862403	CG26084	Th 0635195	506925	2463
1	.3750	84.0000	266.2500	862268	CG26090	Th 0635197	506715	2562

Chemistry Testing

Element (wt %)	Requirements		Final Heat Analysis		Final Heat Analysis	
	Min	Max	862268	Loc	862403	Loc
C	---	.07	.05	BN	.04	BN
MN	---	1.00	.55	BN	.61	BN
P	---	.040	.023	BN	.025	BN
S	---	.030	< .001	BN	< .001	BN
SI	---	1.00	.22	BN	.20	BN
CR	15.00	17.50	15.41	BN	15.50	BN
NI	3.00	5.00	4.74	BN	4.78	BN
MO	---	.50	.20	BN	.22	BN
CU	3.00	5.00	3.26	BN	3.28	BN
CB	.15	.45	.28	BN	.27	BN
TA	---	---	.010	TC	.010	TC
CBT	.15	.45	.29	--	.28	--

 ATI Flat Rolled Products 500 Green Street Washington, PA 15301	Certificate of Test		 Moreen DeFerrari - Sr. Manager, Quality	
	Mill Information		Customer Information	
	Cert Number 0220738-01 Sales Order 50-091-189 Cert Date Oct-26-2021	Name ROLLED ALLOYS INC PO 0200638-TEM PO Date Sep-14-2021		

Chemistry Testing

Element (wt %)	Requirements		Final Heat Analysis		Final Heat Analysis	
	Min	Max	862268	Loc	862403	Loc
CBC	5.00	---	5.96	--	6.28	--

ATI Flat Rolled Products performs chemical analysis by the following techniques for testing locations TC, BN, & LO: C & S by combustion/infrared absorption per ASTM E1019; N & O by inert fusion/thermal conductivity per ASTM E1019; Mn, P, Si, Cr, Ni, Mo, Cu, Cb(Nb), Co, V, W by WDXRF per ASTM E572; Pb, Bi, Ag by GFAA per ASTM E1184; Al and Ti (>=0.10%) by WDXRF per ASTM E572 otherwise by OES per ASTM E1086; Ta by ICP per ASTM E1479.

862268 - Material was produced by EF melting with AOD refining.
USA melt and manufacture
Material melted at ATI FRP Brackenridge (FRPB)

862403 - Material was produced by EF melting with AOD refining.
USA melt and manufacture
Material melted at ATI FRP Brackenridge (FRPB)

FRPB - ATI FRP BRACKENRIDGE 100 River Road Brackenridge, PA 15014

CBC = Cb / C

CBT = Cb + Ta

Mechanical Testing

		LOT 506715		LOT 506715		LOT 506920		LOT 506920		LOT 506925	
Condition:		ANNEALED		H900		ANNEALED		H900		ANNEALED	
Direction:		TRANSVERSE		TRANSVERSE		TRANSVERSE		TRANSVERSE		TRANSVERSE	
Temperature:		ROOM TEMP		ROOM TEMP		ROOM TEMP		ROOM TEMP		ROOM TEMP	
Spec:											
Test Limit	Units	Result	Loc	Result	Loc	Result	Loc	Result	Loc	Result	Loc
HARDNESS	—	34. HRC	TC	44. HRC	TC	35. HRC	TC	45. HRC	TC	35. HRC	TC
YS 0.2% OFFSET	psi	---	--	181000.	TC	---	--	182200.	TC	---	--
TENSILE	psi	---	--	195000.	TC	---	--	195900.	TC	---	--
ELONG. IN 2"	%	---	--	19.	TC	---	--	16.	TC	---	--
RED OF AREA	%	---	--	57.	TC	---	--	54.	TC	---	--



Flat Rolled Products

500 Green Street
Washington, PA 15301

Certificate of Test

Moreen DeParrari
Moreen DeParrari - Sr. Manager, Quality

Mill Information

Cert Number 0220738-01
Sales Order 50-091-189
Cert Date Oct-26-2021

Customer Information

Name ROLLED ALLOYS INC
PO 0200638-TEM
PO Date Sep-14-2021

Mechanical Testing

		LOT 506925	
Condition:		H900	
Direction:		TRANSVERSE	
Temperature:		ROOM TEMP	
Spec:			
Test Limit	Units	Result	Loc
YS 0.2% OFFSET	psi	182800.	TC
TENSILE	psi	199100.	TC
ELONG. IN 2"	%	14.	TC
RED OF AREA	%	47.	TC
HARDNESS	---	45. HRC	TC

When hardness is measured using the Brinell scale, the indentation measuring device is Type A.

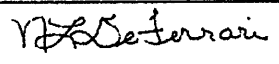
"H", "TH", "RH", and other heat treated values are capability test results.

Mechanical Property Requirements

Condition:		ANNEALED		H900	
Direction:		TRANSVERSE		TRANSVERSE	
Temperature:		ROOM TEMP		ROOM TEMP	
Spec:					
Test Limit	Units	Min	Max	Min	Max
YS 0.2% OFFSET	psi	---	---	170000.	---
TENSILE	psi	---	---	190000.	---
ELONG. IN 2"	%	---	---	8.	---
RED OF AREA	%	---	---	30.	---
HARDNESS	---	---	352. HBW	40. HRC	47. HRC

Metallography - General

Test ID	Result Name	Condition	Test Result	Loc	Requirements
506715 LOT	DELTA FERRITE	ANNEALED	1.00	PE	5.00 max
506920 LOT	DELTA FERRITE	ANNEALED	1.00	PE	5.00 max

 ATI Flat Rolled Products 500 Green Street Washington, PA 15301	Certificate of Test		 Morean DeFerrari - Sr. Manager, Quality
	Mill Information	Customer Information	
Cert Number 0220738-01 Sales Order 50-091-189 Cert Date Oct-26-2021	Name ROLLED ALLOYS INC PO 0200638-TEM PO Date Sep-14-2021		

Metallography - General

Test ID	Result Name	Condition	Test Result	Loc	Requirements
506925 LOT	DELTA FERRITE	ANNEALED	1.00	PE	5.00 max

Certification Statements

Grade verification was performed spectroscopically.

EN 10204:2005 - 3.1 Certificate does not imply that material is an approved PED grade. For a complete listing of approved PED grades, visit our website at www.atimetals.com.

ATI-FRP defines the Grain Orientation Nomenclature as Longitudinal (L) is the Length, Long Transverse (LT) is the width, and Short Transverse (ST) is the thickness or gauge.

The product was solution heat treated at 1900F (1038C) for a time commensurate with thickness and heating equipment and procedure used, and cooled to below 90F (32C).

ATI Flat Rolled Products has complied with all producer requirements of AS6279.

ATI Flat Rolled Products does not use mercury in the testing or production of its products.

No welds/weld repairs performed.

Material tested at ATI Flat Rolled Products GEAE S400 approved facilities (T1225 & T9317): Natrona Heights, PA; Brackenridge, PA and New Bedford, MA.

ATI Flat Rolled Products holds several Quality and Laboratory certifications that include ISO-9001, AS9100, AD 2000-Merkblatt W0, EU Pressure Equipment Directive 14/68/EU, Nadcap, ISO/IEC 17025, GEAE S400 (T1225 & T9317), GEAE S-1000. Refer to www.ATIMetals.com to access the current ATI-FRP quality certifications

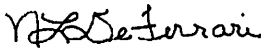
The following test methods are used by the listed lab: ASTM E8 for all specimens for yield, tensile, and elongation except ISO 6892-1 for 80mm specimens; ASTM E290 for bend (for New Bedford Laboratory - Type 2 Free bend is used), ASTM E112 for grain size; ASTM E10, E18, E92, & E384 for hardness; ASME B46.1 Section3 for surface roughness; AMS 2750 for laboratory heat treatment, ASTM E139 for stress rupture; ASTM E29 for rounding; ASTM E3 and E407 for metallographic preparation and etching.

ATI FRP products have not come in contact with radioactive materials during manufacturing or processing.

EN 10204:2005 3.1 Certificate.

General Statements

The Finishing Location for ALL PIECES is ATI-FRP
The shipping location is ATI-FRP WASHINGTON, PA

 ATI Flat Rolled Products 500 Green Street Washington, PA 15301	Certificate of Test		 Moreen DeFerrari - Sr. Manager, Quality
	Mill Information		Customer Information
	Cert Number 0220738-01 Sales Order 50-091-189 Cert Date Oct-26-2021	Name ROLLED ALLOYS INC PO 0200638-TEM PO Date Sep-14-2021	

General Statements

TESTING WAS PERFORMED AT THE FOLLOWING LOCATIONS

- BN = ATI FRP Brackenridge; 100 River Road; Brackenridge, PA 15014
- PE = PRODUCT EVALUATION SYSTEMS; 637 Donohoe Road; Latrobe, PA 15650
- TC = ATI FRP Natrona Heights; 1300 Pacific Avenue; Natrona Heights, PA 15065

Knowingly and willfully recording any false, fictitious or fraudulent statement or entry on this document may be punished as a felony under Federal Statutes, including Federal Law, Title 18, Chapter 47.

WARNING: Processing that makes fumes, dust, or solutions may cause lung disease. Please see Safety Data Sheet for further information which has been supplied to your Purchasing Department. For an additional copy, please refer to our website at:
www.atimetals.com/Products/ati-sds

For access to online Certifications of Test, please register at MyATI.ATIMetals.com

This Certified Material Test Report is a true representation of the data on file. The reported results conform to the sales contract and specification(s) as set forth in ATI Flat Rolled Products order acknowledgement. This Certificate of Test may not be reproduced except in full without the written authorization of the company.

ATI Flat Rolled Products website contains listing of material produced, general technical and contact information, and current quality and company accreditations including but not limited to ISO-9001, AS-9100, Nadcap, and ISO/IEC 17025. Please visit us at www.atimetals.com


Receiving Inspection
By:
Date: 10-28-21



SPECIALTY METALS
80 Clinton Street

Johnstown, PA 15901

Phone: 814-535-9200 Fax: 814-536-1810

www.gautierspecialty.com

SOLD TO

Rolled Alloys
125 W. Sterns Road
Temperance, MI 48182
United States

PRODUCT CERTIFICATION

WORK ORDER	HEAT NUMBER
016041	S8491-01-T1
Tag I.D.	SALES ORDER / RLS
016041/001A	02-020837 / 002
016041/001B	CERT ID / REV
016041/002	00043624 / 01

CUSTOMER P.O.	CUSTOMER PART	QUANTITY	BARS	LADING NO	SHIPMENT DATE
0198697-TEM	0008521	3,043 Lbs	3	28535NCS	10/21/2021
SPECIFICATION PS174PH0050048P-326 Grade: 17-4 Ordered Size: 0.500" x 48.000" Plate Process: Hot Rolled; Solution Annealed; Warm Flattened; Pickled; Edges/End Cut Edge Quality: Cut Edge Surface Finish: As-Rolled/Pickled					
COMMERCIAL DESCRIPTION Grade: 17-4PH Ordered Size: 0.500" x 48.000" Plate Tolerances: Thickness -0.010 +0.055 Width -2.000 +3.000 Length Option: Range Ordered Length: 0.000" Min: 120.000" Max: 158.000" Process: Hot Rolled; Solution Annealed; Warm Flattened; Pickled; Edges/End Cut Edge Quality: Cut Edge Surface Finish: As-Rolled/Pickled Customer Specs: AMS 5604J, ASME SA 693 ASTM A 693-16, DFARS Domestic 252.225-7008 EN 10204 3.1, No Weld Repair UNS S17400 HEAT # S8491-01-T1  TRACER # 0634814US					
CERTIFICATION REQUIREMENTS 1 TEST REPORT WITH SHIPMENT MANIFEST ANALYSIS, CAST METHOD, MELT SOURCE, ANNEALED HARDNESS, H900 CONDITION PROPERTIES					
CERTIFICATION INST. Please email the BOL and TR to: rapaperwork@rolledalloys.com					
Vendor Provided Data					
Vendor	Freq	Save	Macro-Etch		
ENS	0	0	S1 R1 C1		
Heat Analysis (from Vendor)					

We hereby certify that these Chemical and/or Test results are correct as contained in the records of Gautier, Steel Manufactured in U.S.A. and is free of contamination from mercury and/or radioactive materials. No weld repairs have been made to this material.

Robert Sorg, Quality Manager



SPECIALTY METALS
80 Clinton Street

Johnstown, PA 15901

Phone: 814-535-9200 Fax: 814-536-1610
www.gautierspecialty.com

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Rolled Alloys
125 W. Sterns Road
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PRODUCT CERTIFICATION

WORK ORDER
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Tag I.D.
016041/001A
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SALES ORDER / RLS
02-020837 / 002
CERT ID / REV
00043624 / 01

CUSTOMER P.O.	CUSTOMER PART	QUANTITY	BARS	LADING NO	SHIPMENT DATE					
0198697-TEM	0008521	3,043 Lbs	3	28535NCS	10/21/2021					
C	Mn	P	S	Si	Cu	Ni	Cr	Mo	Al	V
.032	.70	.022	.001	.30	3.21	4.84	15.30	.30	.01	.051
Cb	Sn	Ti								
.262	.01	-.001								
Mechanical by Lot										
TEST		UNITS		RESULTS						
Hardness, RC		RC		31						
AMS 2315 Ferrite %										
1										
Melted & Manufactured in										
USA										
Disclaimer Statements										
Other Physical Properties										
TEST		UNITS		RESULTS						
Tensile (ksi), Trans, H900		KSI		195.9						
YS (0.2%)(ksi), Trans, H900		KSI		174.4						
Elong. (2"), Trans, H900		Percent		15.2						
Red. of Area, Trans, H900		Percent		52.9						
Hardness, RC, H900		RC		43						
End of Certification										
Receiving Inspection By: <i>[Signature]</i> Date: 10-25-21										

We hereby certify that these Chemical and/or Test results are correct as contained in the records of Gautier, Steel Manufactured in U.S.A. and is free of contamination from mercury and/or radioactive materials. No weld repairs have been made to this material.

Robert Sorg, Quality Manager

[Signature]

AT-1504

(Version 3)

ELLWOOD NATIONAL STEEL

3 FRONT STREET, IRVINE, PA 16329

Page 1 of 3

ENS

(814) 563-7522
Telefax (814) 563-6330

CERTIFIED TEST REPORT

Date: 7/13/21

Report of Tests of: (4), 11"x50" - Grade 17-4 PH Forged Slab Mult(s)

For Company: Gautler Specialty Metals
80 Clinton St.
Johnstown, 15901

Customer's Order: 02-011092
Date of Order: 1/21/21
Our Shop Order: H000258889
Specification: 17-4 PH

CHEMICAL ANALYSIS

Heat #	C	Mn	P	S	Si	Ni	Cr	Mo	V	Cu	Al	Ti	Sn	Nb
S8491	.032	.70	.022	.001	.30	4.84	15.30	.30	.051	3.21	.01	<.001	.01	.262
	N	Ta												
	.012	.004												

Material Certified: S8491-01-B1 11"x50"x96.25"; S8491-01-T1 11"x50"x83.75"; S8491-02-B1 11"x50"x104.5"; S8491-02-T1 11"x50"x59"

The material was melted using the electric furnace-ladle refined-vacuum oxygen decarburization-vacuum degassed process and was subsequently bottom poured.

This material meets the chemistry and is capable of meeting AMS S604J, ASTM A693-16, ASTM A484-20, ASTM A564-19 Type 630 and ASME SA564 Type 630 (2019).

This material meets the chemistry and properties of AMS 5643V (tested as forging stock).

Nb+Ta = .27

Chemistry per ISO 17025/NADCAP certified laboratory.

The material was melted and produced in the USA, in accordance with the ENS Quality System which is certified to AS9100D and ISO 9001:2015.

Delta Ferrite per AMS 2315 less than 1% as tested on S8491-01-T1/B1 and S8491-02-T1/B1

H900 Tensile Properties:

Sample ID	Ultimate (Ksi)	OFS @ .02% (Ksi)	TE (%)	Reduction Area (%)	Hardness (HBW)
S8491-01-B1 Transverse	194.7	171.9	15	50	416
S8491-02-T1 Transverse	194.9	171.7	15	49	418

I certify that the reported results and statements of the certificate represent the actual attributes of the material furnished and are in full compliance with all purchase order/specification requirements. The recording of false, fictitious or fraudulent statements of errors on this document may be punishable as a felony under Federal Statutes. During the manufacturing process, tests, and inspections, the material did not come in direct contact with mercury or any of its compounds nor with any mercury containing device employing a single boundary of containment. No welding or weld repair was performed on this material. The material was produced free of radioactive elements.

Just G. Stare
Vice President

(Version 3)

ELLWOOD NATIONAL STEEL

3 FRONT STREET, IRVINE, PA 16329

Page 2 of 3



(814) 563-7522
Telefax (814) 563-6330

Macrostructure to ASTM E381

Sample ID	S	R	C
S8491-01-T1	1	1	1
S8491-01-B1	1	1	1
S8491-02-T1	1	1	1
S8491-02-B1	1	1	1

AMS 2303F

Sample ID	F/S
S8491-01-T1	0/0
S8491-01-B1	0/0
S8491-02-T1	0/0
S8491-02-B1	0/0

Material forged to 11"x50" Slab from 40"x53" ingot.

This material meets AMS 2303F (tested as forging stock).

(Version 3)

ELLWOOD NATIONAL STEEL

3 FRONT STREET, IRVINE, PA 16329

Page 3 of 3

ENS

(814) 563-7522

Telefax (814) 563-6330

Company: Gautler Specialty Metals

Heat: 58491

Order: 02-011092

CERTIFIED TEST REPORT REVISION LOG

Date	Approved By	Description
6/1/2021	TPiotrowski	Statements: Removed (Ready for verification per JGS)
7/13/2021	JStevens	Modified Customer Order

RECEIVED
BY: [Signature]
DATE: 10-25-21

Receiving Inspection
By: [Signature]
Date: 10-25-21

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. Rosian

PO 13800 Item #1
10" FV-105 T-Lok
Gate PMI

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
S/N 229551-1	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

ARMI MBH

ANALYTICAL LTD

ISO Certified • 9001 • 17025 • 17043 • 17034

Certificate of Analysis

IARM 35NN

Low Alloy Steel / F11 / 1¼Cr 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.ARMi.com • ARMi@LGCgroup.com

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

INTERNATIONAL
INSPECTION

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



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# - 300 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.



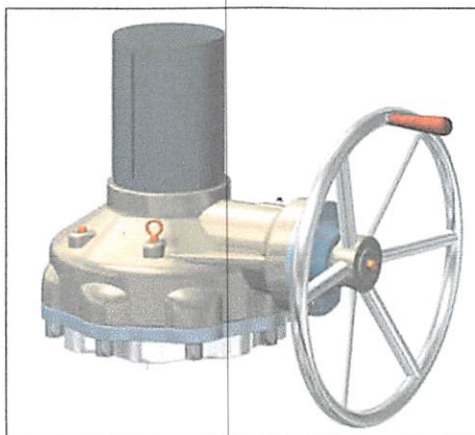
ph: (780) 416-9683 fax: (780) 416-9684
www.endurancevalve.com

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)

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)

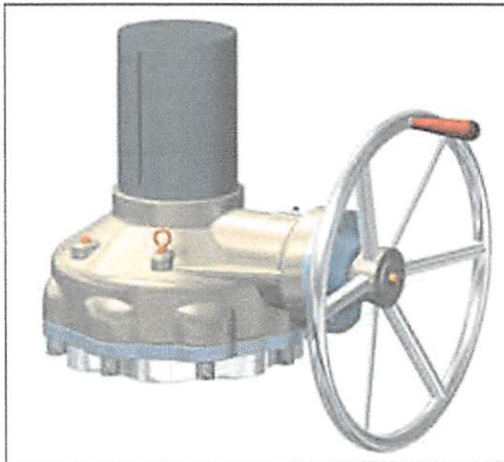
Temperature Range : -4°F □ 284°F (-20°C □ +140°C)

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 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.

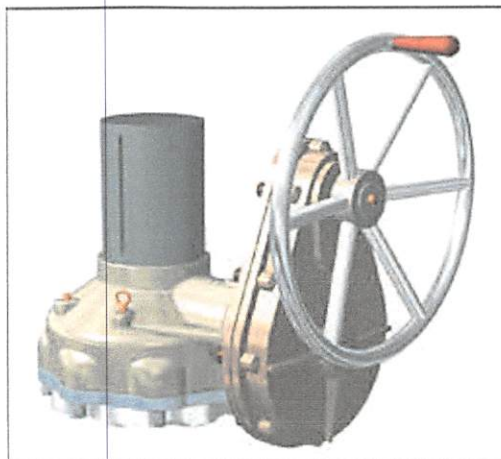


GENERAL TYPE-HORIZONTAL
TYPE-1 Stair

Specifications

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

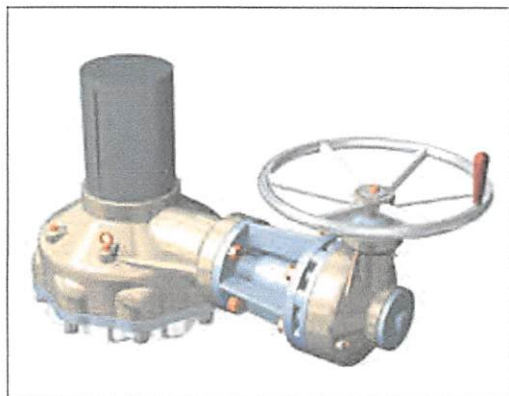
- SB-V6~SB-V8



SUPPORT BOX TYPE HORIZONTAL
TYPE - 2 Stairs

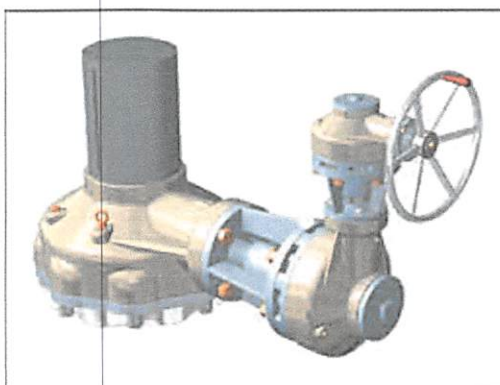
Specifications

- 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

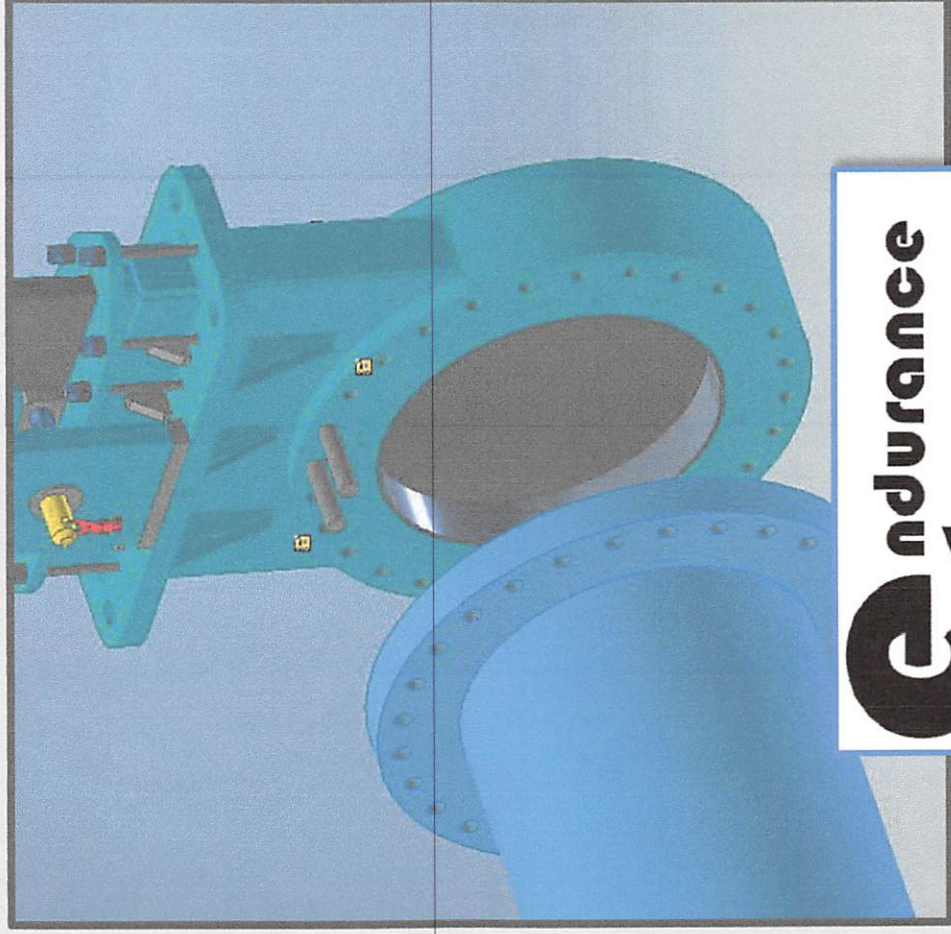
BOLTING STUDS TO VALVE-PIPING

Engineering



STEP 1

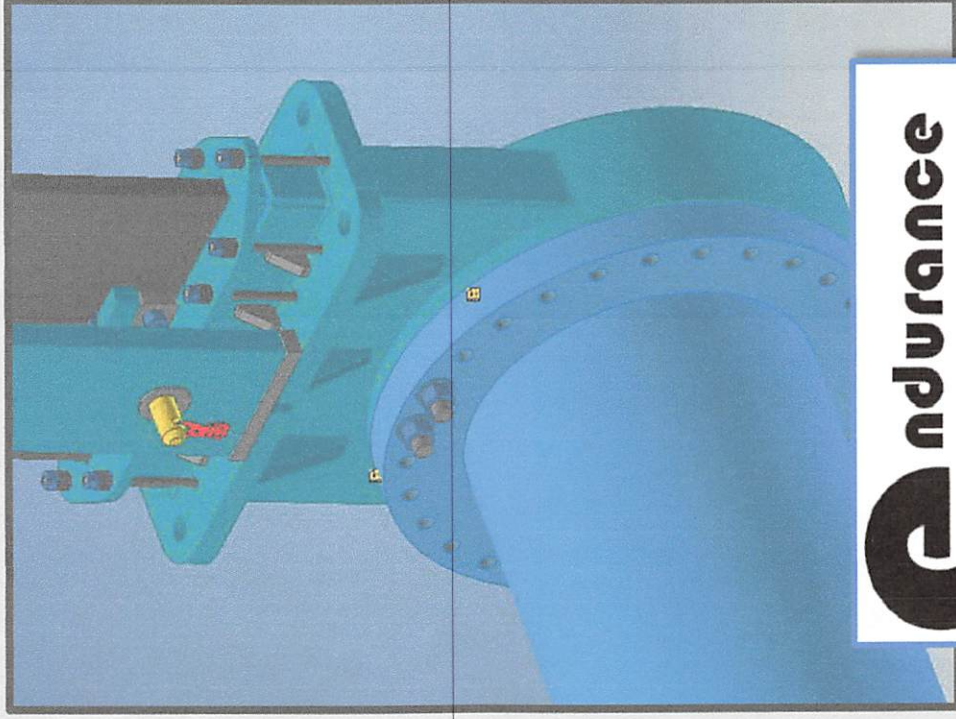
- Begin with 2 studs threaded into the valve next to each other



Endurance
Valve

STEP 2

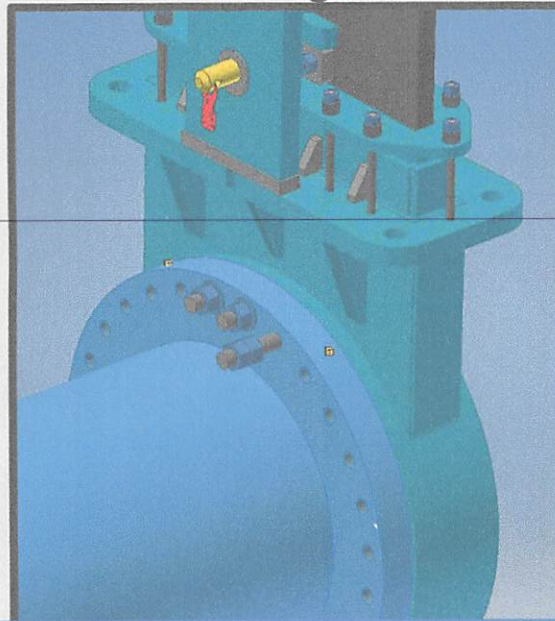
- Line-up to piping and slide flush to pipe and hand snug nuts w/washer



Endurance
Valve

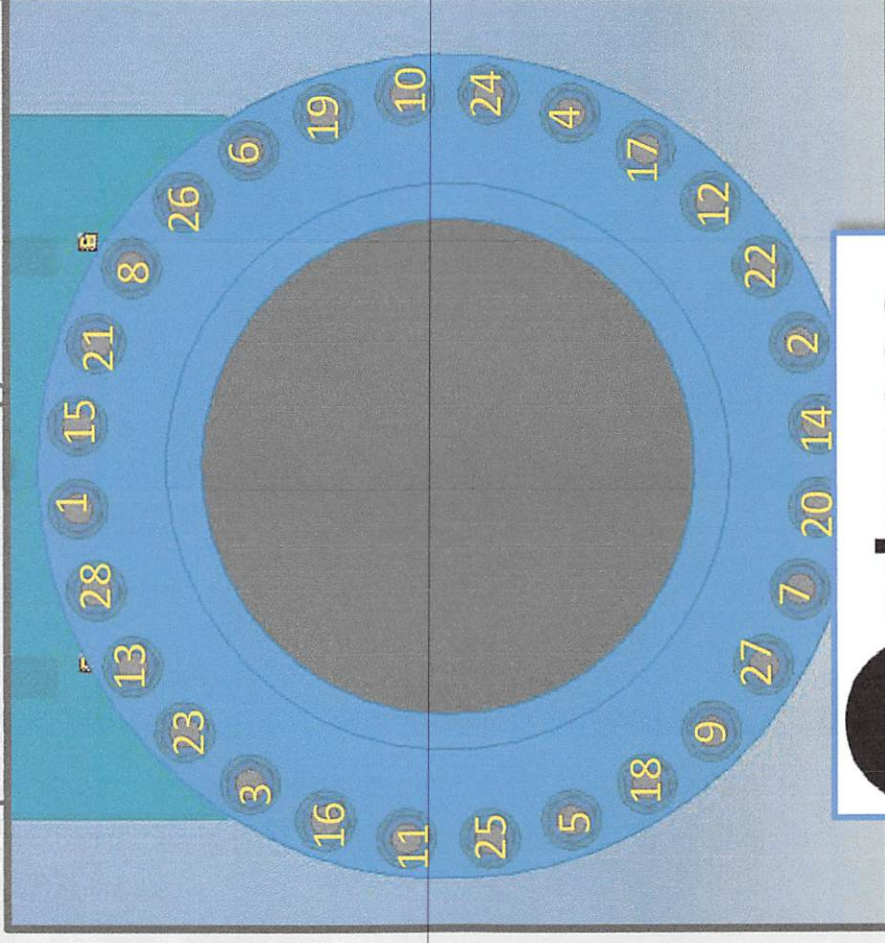
STEP 3

- 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