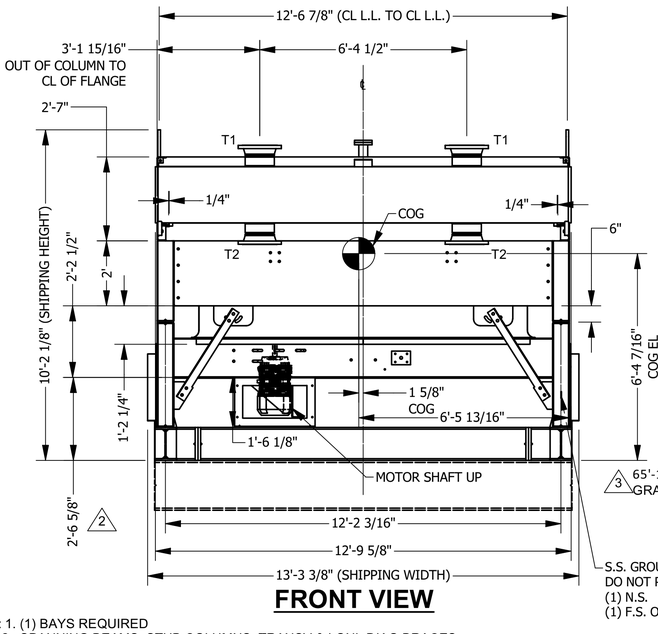
SECTION / DESCRIPTION	MAWP	TEST PRESS	DESIGN TEMP	MDMT	ALTERNATE DESIGN	BUNDLE VOL	BUNDLE WT	LOUVER	HAILSCREENS
UNITS	PSIG	PSIG	DEG F	DEG F	CONDITION	CU FT	LBS		
STRIPPER OVERHEAD CONDENSER	100	130	450	32	FV @ 300F	78	34817	NONE	NONE
18-XF-350 △2									

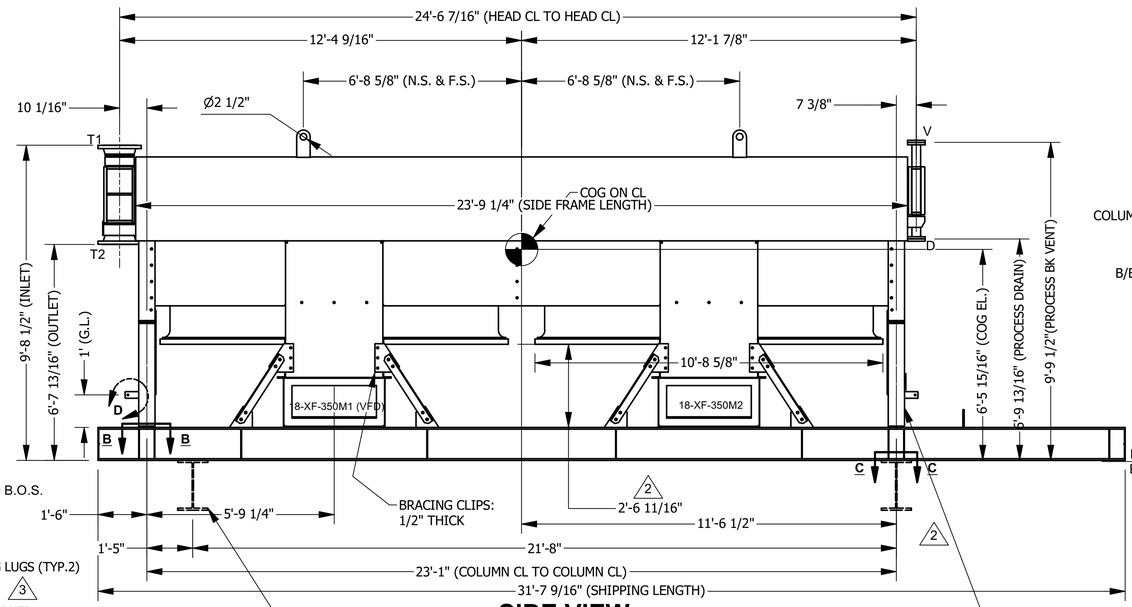
MOTOR HP:	20	**FAN MFGR:**	MOORE	**DIAM (FT):**	10	**SPECIFICATION NOTES:**	**COOLER WT #:** SEE TABLE
TYPE:	TEFC	**CLASS:**	10000	**ACFM/FAN:**	86817	**VIBE TRANS:** WILCOXON	**STRUCTURE FINISH:** PER A8KM-PP-000-500540-A
RPM:	1800	**BLADES:**	4	**HP@ DES.:**	14.6	**VIBE SENSOR MODEL #:** 786A-D2	NON-FIREPROOFED STRUCTURAL STEEL TO BE GALVANIZED
VAC:	460/3/60	**PITCH:**	8.66			**QTY: 2**	**HEADER FINISH:** PER A8KM-PP-000-500520-A
FRAME:	256T	**RPM:**	292	**DRIVE:**	HTD		SYSTEM 1 AFTER HYDROTEST
SHAFT:	1.625	**SERIES:**	42	**RATIO:**	6.16:1		
MOTOR WT:	322 lbs	**TYPE:**	EC	**DRIVE WIDTH:**	36		
QTY:	2	**TIP:**	VE	**AIR BRAKE:**	YES		
		QTY:	2				

WEIGHTS PER BAY(LBS)	
ITEM	WEIGHT
COOLER	40813
SPAN BEAMS	6100 △3
WALKWAY	1333
PROCESS H20	4897
PROCESS FLUID	3483
TOTAL DRY	48246 △3
TOTAL FULL H20	53143 △3
TOTAL OPERATING	51729 △3

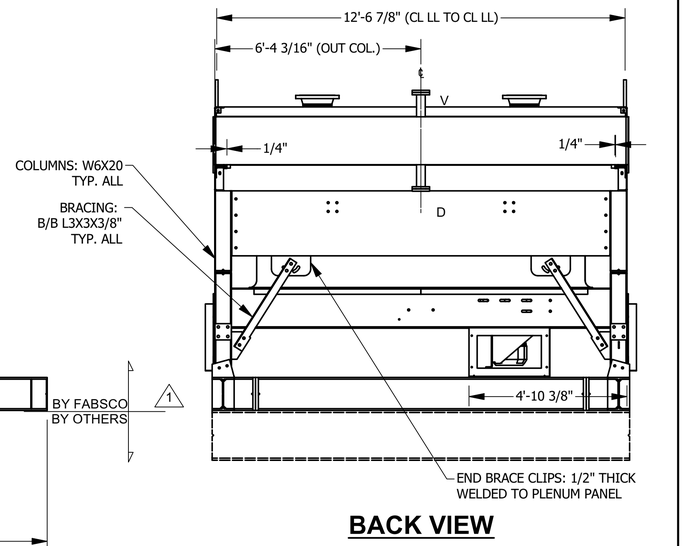
REFERENCE DOCUMENTS △4	
FABSCO DOC. #	APCI DOC. #
A22-13312-1A-300	EN207119-FAB-9V3-00039
A22-13312-1 LL	EN207119-FAB-9V3-00120
A22-13312-1 NOTES	EN207119-FAB-9V3-00283
A22-13312-1-6 LAYOUT	EN207119-FAB-9V3-00043
A22-13312-1 DRIVE	EN207119-FAB-9V3-00314
A22-13312-1-STR	EN207119-FAB-9V3-00038
A22-13312-1-SKID	EN207119-FAB-9V3-00348



FRONT VIEW

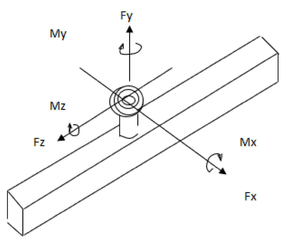


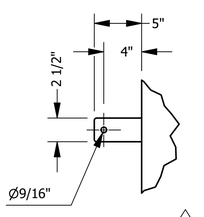
SIDE VIEW



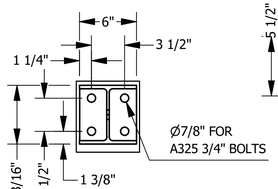
BACK VIEW

△2 NOTE: 1. (1) BAYS REQUIRED
2. SPANNING BEAMS, STUB COLUMNS, TRANSV & LONL DIAG BRACES REMOVED FOR SHIPPING.
3. ALL MOTORS ARE VFD COMPATIBLE, NO SPACE HEATER.
4. UNIT ADJACENT TO 18-XF-354 WITH CONNECTING HEADER WALKWAYS AND AIR SEALS
5. MOTOR REMOVAL BEAM PROVIDED
6. MOTORS SHALL BE RATED FOR CLASS 1, DIV. 2, GROUPS B,C,D AND A T3C TEMPERATURE CODE
7. COOLER WEIGHT INCLUDES: PROCESS BUNDLE, FAN, DRIVES, PLENUM, BRACE ANGLES AND STUB COLUMNS

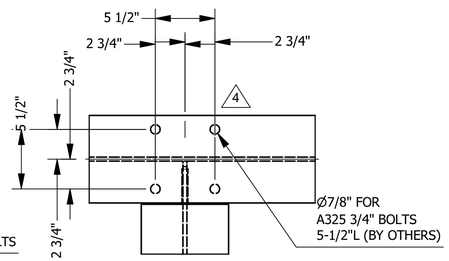




DETAIL D
SS GROUNDING LUG
DON'T PAINT △3



SECTION B-B
W6X20 TO SKID BEAM



SECTION C-C
W12X50 SKID BEAM TO W18 PIPE RACK BEAM

NOZZLE LOADS		QTY/HEAD	SIZE	CLASS, #		2 X API 661
FRONT HEAD		4	10	150		
SIZE	FX	FY	FZ	MX	MY	MZ
	LBS	LBS	LBS	FT LB	FT LB	FTLB
10	3000	6000	4500	6000	9000	3760
COMBINED	12000	24000	18000	24000	36000	15040
MAX API	2250	4500	3750	4500	6000	3000
STR DESIGN LOAD	4500	9000	7500	9000	12000	6000

API 661 NOZZLE LOADS MULTIPLIER = 2.0

EQ. TAG #S △4		
COOLER	EQUIPMENT	TAG #
18-XF-350	MOTOR	18-XF-350M1 (VFD)
18-XF-350	MOTOR	18-XF-350M2
18-XF-350	FAN	18-XF-350-F-01
18-XF-350	FAN	18-XF-350-F-02
18-XF-350	VIB SENSOR	18-VE-XF350A
18-XF-350	VIB SENSOR	18-VE-XF350B

NOZZLE SCHEDULE △2			
LABEL	ITEM	QTY	FLANGE
T1	PROCESS INLET	2	10" 150# RFWN; SCH 80
T2	PROCESS OUTLET	2	10" 150# RFWN; SCH 80
V	PROCESS BK VENT	1	2" 300# RFLWN; BLIND
D	PROCESS BK DRAIN	1	2" 300# RFLWN; BLIND

APPROVED BY: _____
DATE: _____

PROJECT NAME:	**World Energy Renewables Project**
PROJECT NO./UNIT:	**EN-20-7119 / RFJU-B**
CUSTOMER/CLIENT:	**World Energy Paramount**
EQUIPMENT OWNER:	**Air Products Manufacturing LLC**
ITEM NO.:	**18-XF-350**
SERVICE:	**Stripper Overhead Condenser**
LOCATION:	**World Energy, Paramount, CA, USA**
PO NO.:	**4505606036 / A8KM-4-406-PO-1**
FABSCO JOB NO.:	**A22-13312-1**

GENERAL ARRANGEMENT - 18-XF- 350

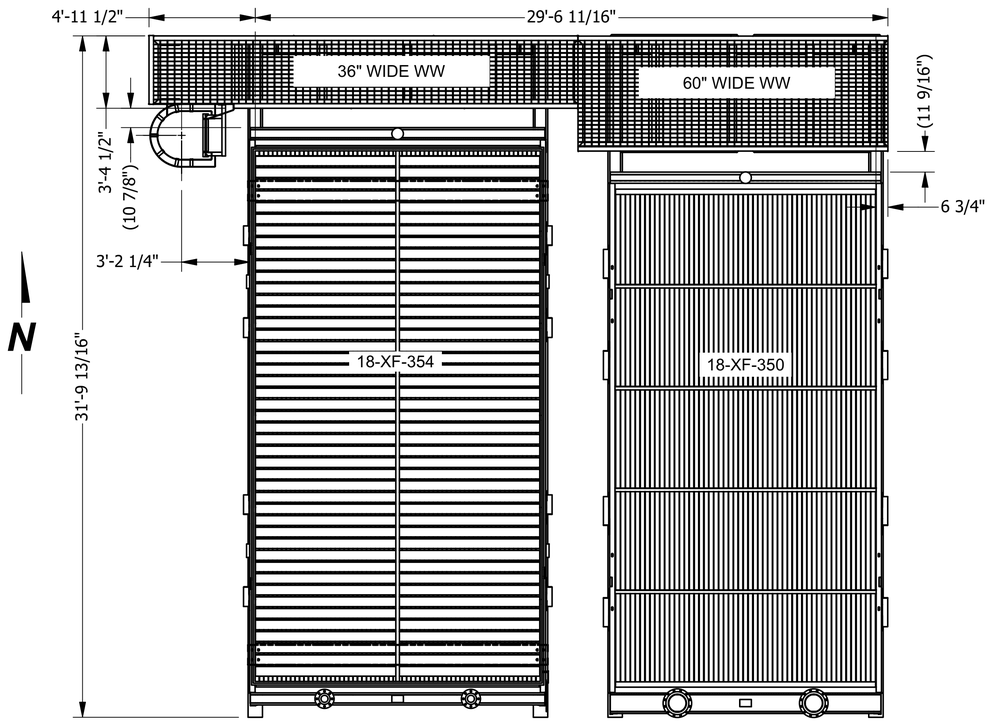
REV.	DATE	DESCRIPTION
0	3/11/2022	FOR APPROVAL
1	4/13/2022	CUST. COMM./ ADD PLEN'M DEPTH FOR MTR RVL BEAM CLR
2	7/26/2022	CUST. COMM./ REVERT BACK TO REV 0 HEIGHT DIMS
3	11/16/2022	SKID WEIGHT/ DIMENSIONS DETAILS PER P.E./ ALIGNMENT W/ LAYOUT DOCUMENT/ ALIGNMENT WITH AP FORMAT
4	12/12/2022	CUST. COMM.
4	2/2/2023	CUST. COMM.

DRAWN BY: BH
DATE: 3/11/2022
CHECKED BY:

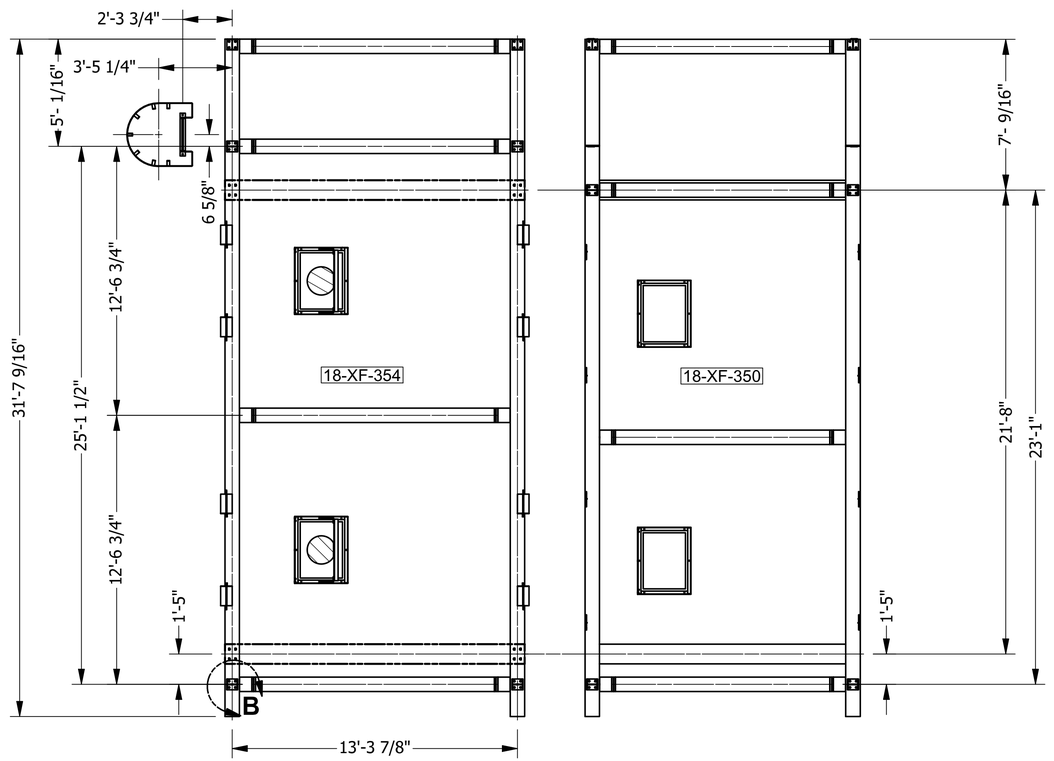
FABSCO Fin-Air, LLC.

DRAWING NO: A22-13312-1-100

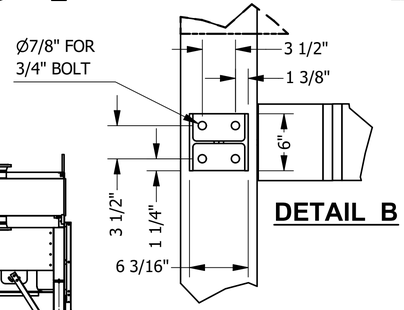
REV: 5



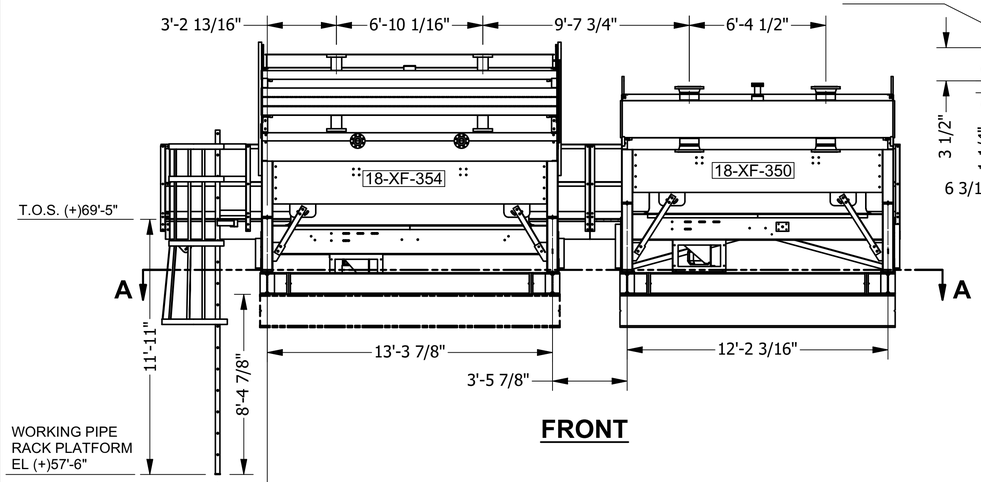
TOP



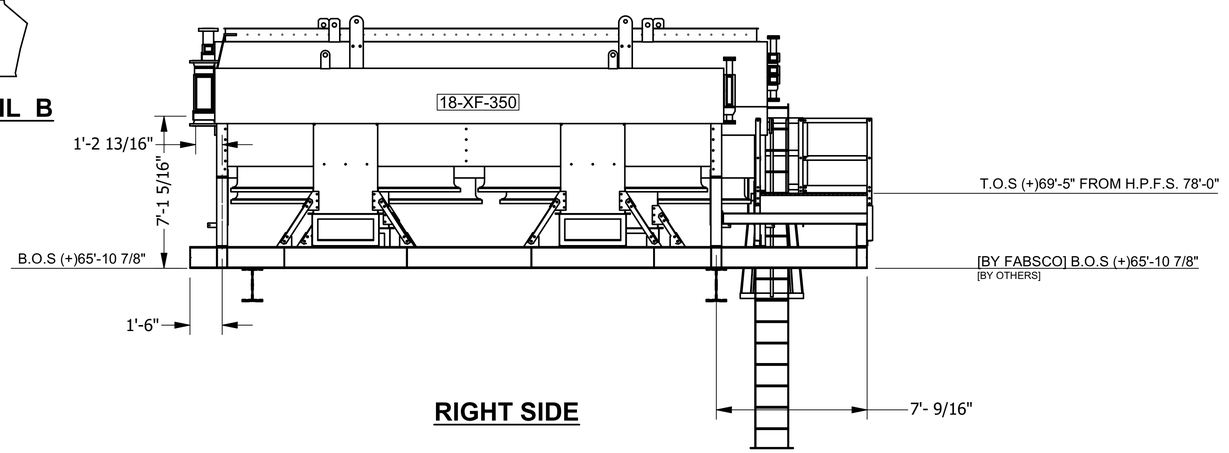
SECTION A-A



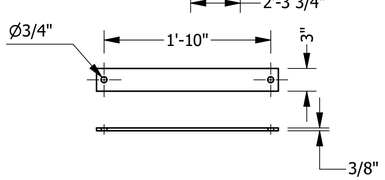
DETAIL B



FRONT



RIGHT SIDE



LADDER ANCHOR PLATE TYP

PROJECT NAME:	World Energy Renewables Project
PROJECT NO./UNIT:	EN-20-7119 / RFJU-B
CUSTOMER/CLIENT:	World Energy Paramount
EQUIPMENT OWNER:	Air Products Manufacturing LLC
ITEM NO.:	18-XF-350 / 18-XF-354 / STRIPPER OVERHEAD CONDENSER
SERVICE:	Off Spec Product Cooler
LOCATION:	World Energy, Paramount, CA, USA
PO NO.:	4505606036 / A8KM-4-406-PO-1
FABSCO JOB NO.:	A22-13312-1 / A22-13312-6

WALKWAY ARRANGEMENT

REV.	DATE	DESCRIPTION
0	3/11/2022	FOR APPROVAL
1	7/12/2022	CUST. COMM.
2	11/16/2022	CUST. COMM. / MEMBER CHANGES PER P.E.
3	12/13/2022	UPDATED 18-XF-354
4	04/27/2023	18-XF-350 WALKWAY

DRAWN BY: BH

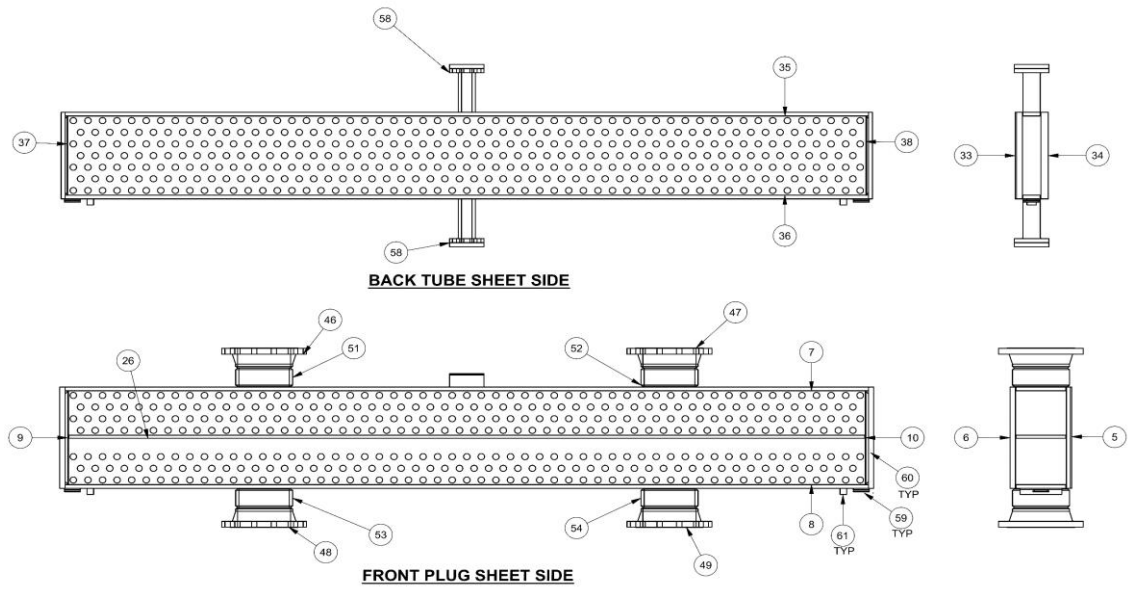
DATE: 3/11/2022

CHECKED BY:

FABSCO Fin-Air, LLC.

DRAWING NO: A22-13312-1-6 LAYOUT

REV: 4



Mark No	MATERIAL DESCRIPTION		
	SUPPLIERS	HEAT No.	MATERIAL
5	SSAB	W2B695	SA-516-70N
6	SSAB	W2B695	SA-516-70N
7	BURNS HARBOR PLATE	813H62860	SA-516-70N
8	BURNS HARBOR PLATE	813H62860	SA-516-70N
9	NUCOR	0605704	SA-516-70N
10	NUCOR	0605704	SA-516-70N
26	NUCOR	0605704	SA-516-70N
33	NUCOR	1608500	SA-516-70N
34	NUCOR	1608500	SA-516-70N
35	BURNS HARBOR PLATE	813H62860	SA-516-70N
36	BURNS HARBOR PLATE	813H62860	SA-516-70N
37	NUCOR	0606978	SA-516-70N
38	NUCOR	0606978	SA-516-70N
46	ULMA	29HC1	SA-350LF2
47	ULMA	29HC1	SA-350LF2
48	ULMA	29HC1	SA-350LF2
49	ULMA	29HC1	SA-350LF2
51	VALLOUREC	M10115	SA-106B
52	VALLOUREC	M10115	SA-106B
53	VALLOUREC	M10115	SA-106B
54	VALLOUREC	M10115	SA-106B
58	AMERIFORGE	CR3-KD	SA-350LF2
59	SSAB	B0J740	A-36
60	SSAB	B0J740	A-36
61	JSW	S30081	A-36
TUBES	MANNESMANN	270569	SA-179

CUSTOMER:	AIR PRODUCT MANUFACTURING LLC.		FABSCO SHELL & TUBE, LLC
PO NO:	4505606036 / A8KM-4-406-PO-1	DATE	
ITEM NO:	18-XF-350	AC	DWG No A22-13312-1A-HS 0

SSAB

Test Certificate

12400 Highway 43 North, Axis, Alabama 36505, US

Form TC1: Revision 4: Date 6 Feb 2019

Customer:
LEECO STEEL PRODUCTS, INC.
1011 WARRENVILLE ROAD
SUITE 500
LISLE
IL 60532

Customer P.O.No.: V25952 | **Mill Order No.** 41-665166-02 | **Shipping Manifest:** AR353021

Product Description: ASME SA516-70/SA516-65/SA516-60(21)
ASTM A516-70/A516-65/A516-60(17)
LCVN 20/15 FT.LBS @ -50F/A673-P
CEV .43% MAX

Size: 1.000 X 120.0 X 480.0 (IN)

Ship Date: 17 Mar 22 | **Cert No:** 081035690
Cert Date: 17 Mar 22 | (Page 1 of 1)

Heat Treat Type: NORMALIZED

Tested Pieces:				Tensiles:						Charpy Impact Tests							
Heat Id	Piece Id	Tested Thickness	Tst Loc	YS (KSI)	UTS (KSI)	%RA	Elong % 2in 8in	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
W2B695	D45	1.008 (DISCRT)	C	50	74		51	T		90 94 128 104		-60F	L	10.	
W2B695	D46	1.007 (DISCRT)	C	52	75		52	T		79 100 113 97		-60F	L	10.	

Chemical Analysis

Heat Id	C	Mn	P	S	Si	Tot Al	Sol Al	Cu	Ni	Cr	Mo	Cb	V	Ti	B	IIW	ORGN
W2B695	.18	.97	.008	.001	.23	.024	.024	.30	.15	.14	.04	.002	.003	.007	.0001	.41	USA

KILLED STEEL
MERCURY IS NOT A METALLURGICAL COMPONENT OF THE STEEL AND NO MERCURY WAS INTENTIONALLY ADDED DURING THE MANUFACTURE OF THIS PRODUCT.
KILLED STEEL, PRODUCED TO A FINE GRAIN PRACTICE.
CEV (IIW) = C + MN/6 + (CR+MO+V)/5 + (NI+CU)/15
NACE MR0175/ISO15156-2:2015 ANNEX A2.1.2 COMPLIANT
NACE MR0103/ISO 17495-1:2015 13.1.1(A) AND 13.1.1(C) COMPLIANT
MTR EN 10204:2004 INSPECTION CERTIFICATE 3.1 COMPLIANT
100% MELTED, POURED, AND ROLLED IN THE USA
NO WELD REPAIR HAS BEEN PERFORMED ON THIS MATERIAL.
NORMALIZED PLATES. HEATED AT 1665F FOR 44 MINUTES.
TEST COUPONS TAKEN FROM HEAT TREATED PLATE.
PRODUCTS SHIPPED:
W2B695 D45 40080805 PCES: 1, LBS: 16335 W2B695 D45 40080806 PCES: 1, LBS: 16335
W2B695 D46 40080804 PCES: 1, LBS: 16335

ANTHONY CARDWELL
08/03/2022

Q.A. APPROVED
By _____ Date 4/22/2022

(P) Cust Part #: 100120480A516-70N

WE HEREBY CERTIFY THAT THIS MATERIAL WAS TESTED IN ACCORDANCE WITH, AND MEETS THE REQUIREMENTS OF, THE APPROPRIATE SPECIFICATION

Jason Thomas
Director Technical Services

Customer Name	Customer PO#	Shipper No	Heat Number
PORT CITY PLATE, INC.DIV. META	126322	313008	813H62860N930974

ArcelorMittal Burns Harbor Plate

QUALITY ASSURANCE
REPORT OF TEST AND ANAYLSES

US HWY 12 Burns Harbor, Indiana

SHIPMENT NO.	DATE SHIPPED	CAR OR VEHICLE NO.		
803-54876	01-03-20	CSS-CHGO-UP	BVRY 062149	PAGE 7

SOLD TO
DELTA STEEL INC
7355 ROUNDHOUSE LN
HOUSTON TX 77078-4528

SHIP TO
DELTA STEEL INC
UPRR SPOT 0275400 YD #15
9217 S FREEWAY
FORT WORTH TX 76161

NOTE	SERIAL NUMBER	PAT NO.	HEAT NUMBER	NO. PCS.	SIZE AND QUANTITY THICKNESS	WIDTH OR DIA.	LENGTH	WEIGHT	YIELD POINT	TENSILE STRENGTH	AF FRAC. ELONG.	RED.
					INCHES	INCHES	INCHES	POUNDS	PSI	PSI	IN	% %

QUALITY STEEL MELTED & MANUFACTURED IN THE U. S. A.
PLATES - ASTM A516-10 GR 70 PVQ KLD FINE GRAIN PRAC CE=.43X PER IIW FORMULA, ASTM A516-10 GR 65 PVQ, ASTM A516-10 GR 60 PVQ, ASME SA516 GR 70 PVQ 2017 EDITION, ASME SA516 GR 65 PVQ 2017 EDITION, ASME SA516 GR 60 PVQ 2017 EDITION, CH-V SA20S5 PLT L 15/12 FTLBS AT -50F, VACUUM DEGASSED --- PLT NORMALIZED & COOLED IN STILL AIR --- TEST CERTS IN ACCORD PROCEDURES IN EN 10204:2004 TYPE 3.1,& PLTS CONTAIN < 1% NI, NOT RESULPHURIZED, BHN <=200 PER NACE MR0175
NO WELD REPAIR WAS PERFORMED ON BELOW PLATE(S)
CO# DFT-45177 GH 402-2269
PLATES HEAT TREATED - TEST SPECIMENS ATTACHED & YIELD STRENGTH @ .5% EUL

N930973	813H62860	1	3/4	121	456	11736	52600	75900	8	31
			N	1650 DEG F -	36 MIN					
(M55)MFST REF#:001										
N930974	813H62860	1	3/4	121	456	11736	55900	77900	8	29
			N	1650 DEG F -	36 MIN					
(M55)MFST REF#:001										
N930975	813H62860	1	3/4	121	456	11736	55300	77600	8	29
			N	1650 DEG F -	36 MIN					
(M55)MFST REF#:001										

Q-QUENCH TEMPERATURE T-TEMPER TEMPERATURE N-NORMALIZE TEMPERATURE

SERIAL NUMBER	PAT NO.	HEAT NUMBER	HARD BHN	BEND	THICKNESS INCHES	TYPE	SIZE	DIR	TEST TEMP. F	CHARPY IMPACT ENERGY FT LBS 1	2	3	SHEAR(%) 1	2	3	LAT. EXP MILS 1	2	3
N930973		813H62860			.750	V	FULL	L	-50	122	177	126						
N930974		813H62860			.750	V	FULL	L	-50	115	131	126						
N930975		813H62860			.750	V	FULL	L	-50	191	141	104						

HEAT NUMBER	CHEMICAL ANALYSIS C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V	Ti	Al	B	Cb	N	Sn	MIQUAID GRAIN SIZE
813H62860	.17	1.09	.011	.004	.305	.220	.18	.04	.006	.001	.002	.033	.0002	.002	.008	.004	
	CE .39																

I certify that the above results are a true and correct copy of actual results contained in records maintained by ArcelorMittal Burns Harbor and are in full compliance with the requirements of the specification cited above. This test report cannot be altered and must be transmitted intact with any subsequent third party test reports, if required.

DHPLTRPT.TIF

HENRY HUYSER PER MWT
SUPV QUALITY ASSURANCE

ANTHONY CARDWELL
08/03/2022

Q.A. APPROVED
By _____ Date 5/2/2022

9
10
26

NUCOR
PLATE MILL

P.O.Box 279
Winton, NC 27986
(252) 356-3700

Mill Test Report

Page 5

1505 River Rd
Cofield, NC 27922
(252) 356-3700

NUCOR
It's Our Nature

Issuing Date : 10/19/2020 B/L No. : 572487 Load No. : 585409 Our Order No. : 181795/4 Cust. Order No. : MUS-257424

Vehicle No: LW 62113

Sold To: METALS USA - SOUTHCENTRAL
2800 N 43RD ST E
MUSKOGEE,OK 74403

Ship To: METALS USA - PLATES AND SHAPES
TRACK 747
MUSKOGEE,OK 74401

Specification: 0.6250" x 120.000" x 480.000"
ASTM A516 70/65/60/485-17/ASMESA516-70/65/60/485 PVQ 2019/2017
Normalized Plate NACEMR0175 Annex 2.1.2 (2015), MR0103 (2010)
Section 2.1.2 (2015) 13.1.1, 13.1.2)Compliant

Marking :

Heat No	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	Al(tot)	V	Nb	Ti	N	Ca	B	Sn	Ceq	Pcm
0605704	0.19	1.07	0.005	0.001	0.21	0.12	0.07	0.06	0.01	0.032	0.005	0.003	0.002	0.0062	0.0018	0.0003	0.013	0.40	0.27

			Tensile Test				Heat Treat			
Plate Serial No	Pieces	Tons	Dir.	Yield (psi)	Tensile (psi)	Elong. % in 2"	Elong. % in 8"	Norm (°F)	Time (min)	Temper (°F)	Time (min)
0605704-04	2	10.20	H-T	47,800	72,500	48.0		1650	27		

			Charpy Impacts																
			Absorbed Energy (Ft-lbs)					Lateral Expansion (in.)					Shear (%)						
Plate Serial No	Pieces	Tons	Dir.	(ft-lbs) 1	(ft-lbs) 2	(ft-lbs) 3	(ft-lbs) Ave	Min	(in.) 1	(in.) 2	(in.) 3	(in.) Ave	(in.) Min	(%) 1	(%) 2	(%) 3	(%) Ave	Min	Temp (°F)	Size
0605704-04	2	10.20	H-L	62.9	86.7	22.3	57.3	15											-60	10mm

ANTHONY CARDWELL
08/03/2022

Manufactured to fully killed fine grain practice by Electric Arc Furnace. Welding or weld repair was not performed on this material.
Mercury has not been used in the direct manufacturing of this material. Produced as continuous cast discrete plate, unless otherwise noted in Specification. For Mexico shipments: nhc-SalesMX@nucor.com
Yield by 0.5EUL method unless otherwise specified. Ceq = C+(Mn/6)+((Cr+Mo+V)/5)+((Cu+Ni)/15)
Pcm = C+(Si/30)+(Mn/20)+(Cu/20)+(Ni/60)+(Cr/20)+(Mo/15)+(V/10)+5B
Melted and Manufactured in the USA. ISO 9001:2015 certified. PED 97/23/EC 7/2 Annex 1, Para. 4.3 Compliant.
DIN 50049 3.1.B/EN 10204 3.1B(2004). DIN EN 10204 3.1(2005) compliant. For ABS grades only, Quality Assurance certificate QA-3624366

We hereby certify that the contents of this report are accurate and correct. All test results and operations performed by the material manufacturer are in compliance with the applicable specifications, including customer specifications.

T. A. Depretis

T. A. Depretis, Metallurgist

10/19/2020 12:02:28 PM

Q.A. APPROVED
By _____ Date 12/2/2020

03/11/2022 From:AMERICAN ALLOY STEEL, INC. TO: PORT CITY METAL SERVICES
P.O.#: 125466 S.O.#: 706677 AA PL#: 5253968
Item: 1 (1 PC) 1-3/8" X 120" X 480"

NUCOR
PLATE MILL GROUP

P.O.Box 279
Winton, NC 27986
(252) 356-3700

Mill Test Report

1505 River Rd
Cofield, NC 27922
(252) 356-3700

AMERICAN ALLOY
PLATE # 52539109

Issuing Date: 12/29/2021 B/L No.: 613103 Load No.: 629058 Our Order No.: 192669/2 Cust. Order No.: 128613-OK

Vehicle No: BALLARD 25

Sold To: AMERICAN ALLOY STEEL INC
6230 N HOUSTON ROSSLYN RD
PO BOX 40469
NORTH HOUSTON,TX 77091

Ship To: AMERICAN ALLOY
6350 N ERIE AVE
OWASSO,OK 74055

Specification: 1.3750" x 120.000" x 480.000"
ASTM A516 70/65/60-17/ASME SA516-70/65/60 PVQ 2019/2021
Normalized Plate NACE MR0175 Annex 2.1.2 (2015), MR0103 (2010)
Section 2.1.2 Compliant (2015) 13.1.1, 13.1.2) Vacuum Degassed

Marking: 128613-OK

Heat No	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	Al(tot)	V	Nb	Ti	N	Ca	B	Sn	Ceq	Pcm
1608500	0.19	1.01	0.012	0.003	0.20	0.18	0.08	0.08	0.01	0.024	0.004	0.003	0.002	0.0057	0.0006	0.0002	0.007	0.39	0.26

			Tensile Test				Heat Treat			
Plate Serial No	Pieces	Tons	Dir.	Yield (psi)	Tensile (psi)	Elong. % in 2"	Elong. % in 8"	Norm (°F)	Time (min)	Temper (°F)	Time (min)
1608500-02	1	11.23	H-T	45,000	72,700	58.8		1650	54		

			Charpy Impacts																
			Absorbed Energy (Ft-lbs)					Lateral Expansion (in.)					Shear (%)						
Plate Serial No	Pieces	Tons	Dir.	(ft-lbs) 1	(ft-lbs) 2	(ft-lbs) 3	(ft-lbs) Ave	Min	(in.) 1	(in.) 2	(in.) 3	(in.) Ave	(in.) Min	(%) 1	(%) 2	(%) 3	(%) Ave	Min	Temp (°F)	Size
1608500-02	1	11.23	H-L	86.4	71.4	99.8	85.9	15											-50	10mm

Certified a true copy of the original, retained in our file.
AMERICAN ALLOY STEEL
12/21/2022

HOT ROLLED CARBON STEEL PLATE
TEST COUPONS TAKEN FROM HEAT TREATED PLATE
Piece frequency charpy;

Manufactured to fully killed fine grain practice by Electric Arc Furnace. Welding or weld repair was not performed on this material. Mercury has not been used in the direct manufacturing of this material. Produced as continuous cast discrete plate, unless otherwise noted in Specification. For Mexico shipments:nhc-SalesMX@nucor.com
Yield by 0.5EUL method unless otherwise specified. Ceq = C+(Mn/6)+((Cr+Mo+V)/5)+((Cu+Ni)/15)
Pcm = C+(Si/30)+(Mn/20)+(Cu/20)+(Ni/60)+(Cr/20)+(Mo/15)+(V/10)+5B
Melted and Manufactured in the USA. ISO 9001:2015 certified. PED 2014/68/EU, 97/23/EC 7/2 Annex 1, Para. 4.3 Compliant. API Q1-1851 DIN 50049 3.1.B/EN 10204 3.1(2004) 3.1B(1993)/ DIN EN 10204 3.1(2005) compliant. ABS QA-3624356

We hereby certify that the contents of this report are accurate and correct. All test results and operations performed by the material manufacturer are in compliance with the applicable specifications, including customer specifications.

T. A. Depretis

T. A. Depretis, Metallurgist

12/29/2021 2:03:24 PM

ANTHONY CARDWELL
08/03/2022

Q.A. APPROVED
By _____ Date 3/14/2022

NUCOR PLATE MILL
P.O.Box 279
Winton, NC 27986
(252) 356-3700

Mill Test Report

Page 3

1505 River Rd
Cofield, NC 27922
(252) 356-3700
NUCOR It's Our Nature

Issuing Date : 12/19/2020 **B/L No. :** 577290 **Load No. :** 590425 **Our Order No. :** 183230/2 **Cust. Order No. :** 120130

Vehicle No: NOKL 725236

Sold To: PORT CITY METALS SERVICES INC A DIVISION OF METALS USA 3101 CHARLES BLVD TULSA,OK 74127 (2)

Ship To: PORT CITY METAL SERVICES, INC. JUNCTION 12 HALE,OK 74127

Specification: 0.5000" x 96.000" x 480.000"
ASTM A516 70/65/60/485-17/ASME SA516-70/65/60/485 PVQ 2019/2017
Normalized Plate NACE MR0175 Annex 2.1.2 (2015), MR0103 (2010)
Section 2.1.2 (2015) 13.1.1, 13.1.2)Compliant

Marking :

Heat No	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	Al(tot)	V	Nb	Ti	N	Ca	B	Sn	Ceq	Pcm
0606978	0.20	1.05	0.007	0.001	0.23	0.22	0.09	0.06	0.02	0.027	0.003	0.002	0.001	0.0060	0.0023	0.0004	0.009	0.41	0.28

			Tensile Test					Heat Treat			
Plate Serial No	Pieces	Tons	Dir.	Yield (psi)	Tensile (psi)	Elong. % in 2"	Elong. % in 8"	Norm (°F)	Time (min)	Temper (°F)	Time (min)
0606978-06	3	9.80	H-T	50,200	75,200	39.6		1650	23		

			Charpy Impacts																
				Absorbed Energy (Ft-lbs)					Lateral Expansion (in.)					Shear (%)					
Plate Serial No	Pieces	Tons	Dir.	(ft-lbs) 1	(ft-lbs) 2	(ft-lbs) 3	(ft-lbs) Ave	Min	(in.) 1	(in.) 2	(in.) 3	(in.) Ave	(in.) Min	(%) 1	(%) 2	(%) 3	(%) Ave	Min	Temp (°F)	Size
0606978-06	3	9.80	H-L	89.5	85.2	88.7	87.8	15											-50	10mm

ANTHONY CARDWELL
08/03/2022

Piece frequency charpy;

Manufactured to fully killed fine grain practice by Electric Arc Furnace. Welding or weld repair was not performed on this material.
Mercury has not been used in the direct manufacturing of this material. Produced as continuous cast discrete plate, unless otherwise noted in Specification. For Mexico shipments:nhc-SalesMX@nucor.com
Yield by 0.5EUL method unless otherwise specified. Ceq = C+(Mn/6)+((Cr+Mo+V)/5)+((Cu+Ni)/15)
Pcm = C+(Si/30)+(Mn/20)+(Cu/20)+(Ni/60)+(Cr/20)+(Mo/15)+(V/10)+5B
Melted and Manufactured in the USA. ISO 9001:2015 certified. PED 97/23/EC 7/2 Annex 1, Para. 4.3 Compliant.
DIN 50049 3.1.B/EN 10204 3.1B(2004), DIN EN 10204 3.1(2005) compliant. For ABS grades only, Quality Assurance certificate QA-3624366

We hereby certify that the contents of this report are accurate and correct. All test results and operations performed by the material manufacturer are in compliance with the applicable specifications, including customer specifications.

T. A. Depretis, Metallurgist

12/19/2020 4:03:09 PM

Q.A. APPROVED
By _____ Date 12/21/2020

ULM11787 / 29HC1 / 10.0RFWN#15S80L / 10" 150# RFWN S80 A350 LF2

13312-FL

46
47
48
49

CLIENTE / Customer / Client

USA

CERTIFICADO DE INSPECCION

Inspection Certificate - Certificat de Réception

UNE EN 10204:06 / 3.1
ISO 10474:13 / 3.1

FECHA: Date: 15/12/2021

N.º No. 217237

HOJA: Page: 1

ISO 9001:2015 10268084 | ISO 14001:2015 10268086 | ISO 45001:2018 10373570
Management Systems certified by LRQAE

Certified acc. PED 97/23/EC+AD2000-W0
PED 14/68/UE
by TÜV Rheinland
N.º 01 202 E/Q 02 7443

ULMA Advanced Forged Solutions

ULMA FORJA, S.COOP.
Bº Zubillaga, 3 - Apdo. 14
20560 OÑATI (Gipuzkoa) SPAIN
Tel.: 34 - 943 780552
Fax: 34 - 943 781808
E-mail: ulma@ulmaforge.com

Packing List: 165905
Expedition: 387341

PRODUCTO / Article - Produit: **FLANGES**

SU PEDIDO N.º / Your Order No. / Votre Cde. N.º: **303507**

DE / of. - de: **15/10/2021**

NORMAS APLICABLES / Requirements - Normes Applicables: **ASME B16.5-17**

MATERIAL CORRESPONDIENTE / Material Correspondent - Qualité: **ASME SA350LF2CL1-2-19, ASTM A350LF2CL1-2-18**
ASME SA105N-17, ASTM A105N-18
NACE MR0175/ISO15156-02/03-15 & NACE MR0103/ISO17945-15

MODO DE FUSION (*) / Steel Making - Elaboration de l'acier: E = Elec. Y = Oxígeno básico

MARCA DEL FABRICANTE / Mark of factory / Marque du fabricant

DEPARTAMENTO / Section / Département: **QUALITY ASSURANCE**

PARTIDA / Item / Poste	CANTIDAD / Quantity / Quantité	DESCRIPCION / Description / Description	LOTE	OBSERVACIONES / Remarks / Observations (*)	COLADA N.º / Heat No / N.ºCoulée	RESISTENCIA T.Strength Resist Rupt N/mm2	LIMITE ELAST. Y.Strength 0.2 % N/mm2	ALARGAM. Elongation Allongement Lo:50mm/4d %	ESTRICCION Red. Area Striction %	RESILIENCIA Impact test Résilience Joules			CHARPY V 10x10mm PROBETA SPECIMEN MEDIA Average Moyenne	°C	DUREZA Hardness Dureté HBW
5 4-O----FF721AAA	28	WN 4 150LB S120 RF A350LF2	03D107	NE	25HC1	528	336	33,96	71,17	38	65	82	62	-50	146 149
9 10L----FF721AAA	1	WN 10 150LB S80 RF A350LF2	17E020	NE	03EC0	505	324	34,90	72,29	120	122	93	112	-50	143 146
9 10L----FF721AAA	35	WN 10 150LB S80 RF A350LF2	30N103	NE	29HC1	548	344	31,80	70,35	65	112	53	77	-50	144 146
48 8------FF726CAA	3	BLIND 8 600LB RF A350LF2	25N114	NE	57AV1	505	314	35,72	71,99	78	90	60	76	-50	146 149
48 8------FF726CAA	59	BLIND 8 600LB RF A350LF2	25N122	NE	57AV1	505	314	35,72	71,99	78	90	60	76	-50	146 149
48 8------FF726CAA	10	BLIND 8 600LB RF A350LF2	26N102	NE	57AV1	505	314	35,72	71,99	78	90	60	76	-50	146 149
59 1-Q----FF721DAA	50	SW 1 150LB S160 RF A350LF2	03N125	NE	O0AV9	523	327	35,95	75,89	106	69	115	97	-50	140 143

COMPOSICION QUIMICA - STEEL MAKER'S LADLE ANALYSIS - ANALYSE CHIMIQUE

COLADA N.º / Heat No / Ladle: L Product: P	C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	Nb %	V %	Cu %	Al %	Ti %	Ca %	B %	CEq %	Origin of Stee
25HC1 L	0,190	0,210	1,120	0,009	0,002	0,080	0,070	0,012	0,001	0,002	0,170	0,034	0,002	0,002	0,0003	0,41	France
03EC0 L	0,171	0,220	1,100	0,010	0,003	0,120	0,110	0,020	0,002	0,003	0,190	0,027	0,002	0,002	0,0001	0,40	Croatia
29HC1 L	0,180	0,210	1,100	0,010	0,003	0,080	0,070	0,010	0,001	0,003	0,160	0,029	0,002	0,001	0,0003	0,40	France
57AV1 L	0,180	0,210	1,130	0,006	0,001	0,080	0,050	0,010	0,000	0,000	0,040	0,028	0,002	0,001	0,0002	0,39	France
O0AV9 L	0,180	0,210	1,070	0,008	0,006	0,080	0,060	0,020	0,002	0,002	0,190	0,028	0,002	0,001	0,0003	0,40	Poland

- Las dimensiones y la condición superficial se hallaron satisfactorias.
- Dimension and surface condition were found acceptable.
- Les dimensions et états de surface sont satisfaisants.

- Los materiales citados cumplen las normas aplicables.
- Manufacturing requirements are satisfied.
- Les normes applicables sont respectées.

EL INSPECTOR
Works Inspector - L'Inspecteur

ULMA FORJA S. COOP.
Dpto. de Garantía de calidad
Quality Assurance Dept.

A. ASTIGARRAGA/QA MANAGER

(*) OBSERVACIONES: Remarks / Observations

ALL FLANGES MANUFACTURED IN ULMA, SPAIN.
N_NORMALIZED ABOVE 900ºC AND COOLED UNIFORMLY IN STILL AIR

ANTHONY CARDWELL
08/03/2022

VMS1098 / M10115 / 10.0A106S80D / 10 S80 A106B SMLS PIPE

51
52
53
54

vallourec

2669 Martin Luther King Jr Blvd
Youngstown,OH 44510

VALLOUREC STAR LP
Seamless Tubular Products

Certified Test Report
03/16/2022
Revision: 0

Order: Y-221121110-001 **Desc:** Seamless Line Pipe - As Rolled
Grade: API 5L X42/B R-BR PSL2 46th Edition April 01, 2018
OD(in): 10.750 **Wall(in):** 0.594 **Lbs/Ft:** 64.49 **Length:** Double Random
End Finish: Plain End Beveled
Comments: Melted and Manufactured in Youngstown, Ohio USA
Pipe is also manufactured to: ASTM A106B/C-19a, ASTM A53B-20, ASME SA106B/C-2021, ASME SA53B-2021. Vallourec Star's QA program meets the requirements of DIN EN10204-2004 Type 3.1. Satisfies NACE MR0175/ISO15156:2015 and ANSI/NACE MR0103/ISO17945:2015.
No repair welding has been conducted. Material is free from Mercury.

Customer:
Customer Order: 304335

SLN / (Heat): M10115
Split: 01

Mechanical Properties

			Tensile Size Specimen Cross Section			Strength (ksi)			Elongation		
Orientation	Type	Position	Width (in)	Thick (in)	Area (sqin)	Yield	Tensile	Y/T Ratio	Gage Length	% Elong	% RA
Longitudinal	Strip	Lead	1.510	0.617	0.9400	46.1	76.2	0.60	2	49.0	58.0

Required Min/Max Yield Strength (ksi): 42.1/71.8
Required Min/Max Tensile Strength (ksi): 70/95
Calculated Max Internal Yield (psi): 4458

Required Min Elongation(%): 30

Supplemental Requirements

Flattening Test	Passed
Hardness 3 Point	80.7 avg HRBW
Hydrostatic Pressure	3000 psi
Hydrostatic Hold Time	5 seconds

Chemical Analysis **Chem Spec:** 61S

WT%	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	Sn	Nb	V	Al	Ca	B	Ti	N	C.E.
Heat	0.21	0.88	0.008	0.007	0.22	0.18	0.07	0.10	0.02	0.011	0.000	0.001	0.035	0.0019	0.0002	0.003	0.0096	0.40
Product 1	0.22	0.90	0.009	0.008	0.23	0.18	0.08	0.10	0.02	0.012	0.000	0.001	0.036	0.0013	0.0002	0.003	0.0076	0.41
Product 2	0.22	0.89	0.008	0.007	0.23	0.18	0.08	0.10	0.02	0.012	0.000	0.001	0.036	0.0016	0.0001	0.003	0.0078	0.41

Charpy Impact Testing

	Notch	Direction	Size	Temp °F	Ft Lbf 1	Ft Lbf 2	Ft Lbf 3	Ft Lbf Avg	Shear 1	Shear 2	Shear 3	Shear Avg
Min Target	--	Transverse	1/1	32	15	15	15	20	NR	NR	NR	NR
Actual	V	Transverse	1/1	32	60	46	48	51	20	30	30	27

NR - Not Required

This material has been produced and tested in accordance with the requirements of applicable specifications unless otherwise listed below. We hereby certify that the above test results are representative of those contained in the records of the company. Any modification to this certification as provided by Vallourec Star without the expressed written consent of Vallourec Star negates the validity of this test report. Vallourec Star is not responsible for the inability of this material to meet specific applications.

THIS CERTIFICATE IS NOTARIZED ONLY WHEN REQUESTED.

Signed: Jeff Schultz

Name: Jeff Schultz, Lab Supervisor
Date Approved: 03/17/2022

ANTHONY CARDWELL
08/03/2022

VMS1098 / M10115 / 10.0A106S80D / 10 S80 A106B SMLS PIPE

vallourec

2669 Martin Luther King Jr Blvd
Youngstown,OH 44510

VALLOUREC STAR LP
Seamless Tubular Products

Certified Test Report
03/16/2022
Revision: 0

Order: Y-221121110-001 **Desc:** Seamless Line Pipe - As Rolled
Grade: API 5L X42/B R-BR PSL2 46th Edition April 01, 2018
OD(in): 10.750 **Wall(in):** 0.594 **Lbs/Ft:** 64.49 **Length:** Double Random
End Finish: Plain End Beveled
Inspection Company: L Bay

Customer:
Customer Order: 304335

SLN / (Heat): M10115
Split: 01

Non-Destructive Evaluation Criteria

EMI CHANNELS
ID
- 10% Longitudinal
- 10% Transverse

OD
- 10% Longitudinal
- 10% Transverse

FULL LENGTH WALL THICKNESS CHECK
Wall
- 87.5% Wall Reduction
- Required Volumetric Coverage: 100%

ADDITIONAL REQUIREMENTS
- Notch Length 1.5" Max
- Notch Width .020" Max
- Untested Ends Cropped

OD
- Visual Insp. Full Length - White Light

ID
- Visual Insp. Pipe Ends - White LIght

ANTHONY CARDWELL
08/03/2022

Ameriforge

An AFG Holdings Company

Material Test Report

Heat Code: CR3-KD

Forged Vessel Connections (FVC)
13770 Industrial Rd. Houston, TX 77015
Sales: (713) 393-4200

ISO 9001:2015 Certified

Lee Supply, Inc. LSI0001
821 East Independence
Tulsa, OK 74106

PO: 22-1789-CM | Sales Order: 188481 | Line: 1
Item Code: LWN020300090A004A1 | Qty Shipped: 2
Item Desc: 2 X 300 X 9 LWN RF SA350-LF2-CL1
Mill Heat: C206734

Spec: ASTM A350(18)/ASME SA350(21)- LF2 CL1 & ASTM A105/A105M(21)/ASME SA105/SA105M(21)

Element	(%wt)	Ladle	Product	EPCRA	CAS#
C	Carbon	0.17			
Mn	Manganese	1.13		Y	7439-96-5
Mn:C		6.6			
P	Phosphorous	0.013			
S	Sulphur	0.004			
Si	Silicon	0.24			
Cu	Copper	0.16		Y	7440-50-8
Ni	Nickel	0.05		Y	7440-02-0

Element	(%wt)	Ladle	Product	EPCRA	CAS#
Cr	Chromium	0.13		Y	7440-47-3
Mo	Molybdenum	0.02			
V	Vanadium	0.03			
Cb	Columbium	0.001			
B	Boron	0.0004			
Al	Aluminum	0.024			
C.E.		0.41			

Mechanical Testing

Test Lab	GOOLSBY GT:22-2403
Test Bar Size	3x3x11
HBW	156 - 156
Elg (%)	36.5
RA (%)	68
Tensile Specimen Size (in)	.500
Tensile (ksi)	76.6
Yield (ksi)	49.5
Gauge Length (in)	2
Charpy Orientation	LONGITUDINAL
Charpy Temp(F)	-50
Charpy Specimen Size (mm)	10X10
Charpy (ft lbs)	68 - 50 - 55
Avg Energy 3 Specimens (ft-lbs)	58
Min Energy 1 Specimens (ft-lbs)	50
% Shear	20 - 20 - 20
Lat. Exp.(in)	.056 - .043 - .062

Heat Treat

Norm. Temp. (F)	1676
Norm. (Hrs)	4
Norm. Cooling Type	AIR

Other

Gr.Sz	13.5

ANTHONY CARDWELL
08/03/2022

Certification No.: 1598654
Certification Date: 7/11/2022
Issued By: Maria Ramirez

This report is issued in compliance with the requirements of EN10204 3.1 / ISO 10474 3.1.b

FVC622 / CR3-KD / 2.0RFLWNX9#30L / 2" 300# RFLWN X 9" A350 LF2

Material Test Report

Heat Code: CR3-KD

Forged Vessel Connections (FVC)
13770 Industrial Rd. Houston, TX 77015
Sales: (713) 393-4200

ISO 9001:2015 Certified

Lee Supply, Inc. LSI0001 821 East Independence Tulsa, OK 74106	PO: 22-1789-CM	Sales Order: 188481	Line: 1
	Item Code: LWN020300090A004A1	Qty Shipped: 2	
	Item Desc: 2 X 300 X 9 LWN RF SA350-LF2-CL1		
	Mill Heat: C206734		
Spec: ASTM A350(18)/ASME SA350(21)- LF2 CL1 & ASTM A105/A105M(21)/ASME SA105/SA105M(21)			

Material is Fully Killed; Fine Grain Practice

Product compliant with NACE MR0175/ISO 15156-2:2015, Annex A (A.2.1.2, A2.1.3).
Product compliant with NACE MR0103/ISO 17945:2015, Section 13.1.1 and 13.1.3.

We hereby certify that the material represented by this document has been tested and is in conformance with the Purchase Order and Specification Requirements.

* No Weld repair performed.
* Ladle Chemical Analysis results are reported from the raw material suppliers MTR.
* Tensile taken from a round specimen. Measurement of elongation after fracture.
* Yield strength was determined using the .2% offset method, unless specified.
* All material supplied under this order is certified to be free of mercury contamination and no mercury bearing equipment was used in manufacturing, fabrication or testing.
* When reported on MTR: Tensile Testing Per ASTM E8; Brinell Hardness Per ASTM E10; Charpy Testing Per ASTM E23
* AF Global manufactures materials according to a certified Quality Management System conforming to ISO 9001:2015 and PED certified to 2014/68/EU, Annex 1, Section 4.3.
Unless otherwise noted on PO, Dimensions of all standard pipe flanges and flange fittings (NPS 1/2 to NPS 24) per ASME B16.5-2020 , large diameter steel flanges (NPS 26 to 60) per ASME B16.47-2020, Orifice flanges per ASME B16.36-2020.
* AFGlobal uses the latest edition of ASTM E29 (Standard practice for using significant digits in test data to determine conformance with specifications), to claim conformance or nonconformance to a specification. When a accept/reject determination is required AFGlobal uses a test uncertainty ratio (TUR) of 1:1 or higher as acceptable.
* DNV-GL PED Certificate No 10000425664-PA-ACCREDIA-USA Valid thru December 03, 2023.

ANTHONY CARDWELL
08/03/2022

Certification No.: 1598654
Certification Date: 7/11/2022
Issued By: Maria Ramirez

Dusty Bannon - Quality Analyst

This report is issued in compliance with the requirements of EN10204 3.1 / ISO 10474 3.1 b

SSAB

Test Certificate

1770 Bill Sharp Boulevard, Muscatine, IA 52761-9412, 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 TC1: Revision 4: Date 6 Feb 2019

Customer:
STEEL & PIPE SUPPLY
P.O. BOX 1688

MANHATTAN
KS 66502

Customer P.O.No.: 4500353651 | **Mill Order No.** 41-617854-01 | **Shipping Manifest:** MR417701

Product Description: ASTM A36(19)/A709(18)36/ASME SA36(19)
0.80%-1.20% MN, MAX 0.05% SI, 0.45% CEV

Ship Date: 27 Oct 20 | **Cert No:** 061863816
Cert Date: 27 Oct 20 | (Page 1 of 1)

Size: 0.242(MIN) X 72.00 X COIL (IN)

Tested Pieces:				Tensiles:							Charpy Impact Tests										
Heat Id	Piece Id	Tested Thickness	Tst Loc	YS (KSI)	UTS (KSI)	%RA	Elong % 2in	Elong % 8in	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
B0J739	0673	0.250		54	73		26		T													
B0J740	0663	0.250		50	70		34		T													

Chemical Analysis

Heat Id	C	Mn	P	S	Si	Tot Al	Cu	Ni	Cr	Mo	Cb	V	Ti	B	N	IIW	ORGN
B0J739	.16	.83	.006	.004	.03	.027	.31	.15	.09	.03	.001	.002	.006	.0000	.0081	.35	USA
B0J740	.16	.84	.008	.003	.04	.024	.32	.15	.12	.04	.000	.002	.006	.0000	.0079	.36	USA

KILLED STEEL
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.
CEV (IIW) = 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:

B0J740	0665	PCES:	1,	LBS:	49200	B0J739	0670	PCES:	1,	LBS:	49200
B0J739	0668	PCES:	1,	LBS:	49250	B0J739	0667	PCES:	1,	LBS:	49200

ANTHONY CARDWELL
08/03/2022

Q.A. APPROVED
By _____ Date 2/3/21

(P) Cust Part #. 70872999M3

WE HEREBY CERTIFY THAT THIS MATERIAL WAS TESTED IN ACCORDANCE WITH, AND MEETS THE REQUIREMENTS OF, THE APPROPRIATE SPECIFICATION

Brian Wales
SENIOR METALLURGIST PRODUCT

JSW Steel (USA) INC.
5200,East McKinney Road,
BAYTOWN, TX 77523

METALLURGICAL TEST REPORT

MET - 04 Rev. No.: Rev. Date:02/27/2018

5/9/2022

Certifctn	Order Item	Heat	PO No.	Shipping Mode		Order Dimensions	Slab Origin	TC No.
T112982	JSW18688-06	S30081	25.448	TRUCK		1.25x96x240	JSW USA	T112982-0081-1

MELTED AND MANUFACTURED IN THE USA.

Plates Certified for the Following grades	Specifications	Marking Instructions
ASTM-A36, ASTM-A709-36, ASME-SA36 AR		Stencil in 1 location(s); X Loc. 18 Y Loc. 30; CUST; MADEINUSA PN PO; DIM GRADE; FREIGHT ORDERITEM PLATEID SHIPWEEK SLABID
Hot Rolled Carbon Steel Plates Plates Manufactured In the USA		TRANSMODE Stamp in 1 location(s); X Loc. 18 Y Loc. 12; Slab ID; Slab ID; Slab ID

Sold To: SUNBELT GROUP INC. 1990 POST OAK BLVD.SUITE 950 HOUSTON, TX 77056
Ship To: SUNBELT GROUP C/O RICHARDSON CO 2333 CLINTON DRIVE GALENA PARK, TX 77547

Complies with ASTM A36 2019

Test	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	Sn	Al	N	V	B	Ti	Nb	Ca	CE
LADLE	0.16	1.06	0.006	0.003	0.19	0.116	0.095	0.051	0.010	0.006	0.032	0.0090	0.005	0.0002	0.002	0.003	0.0024	0.36

Carbon Equivalent CE = C + Mn/6 + (Cr + Mo + V)/5 + (Ni + Cu)/15
PCM = C + Si/30 + Mn/20 + Cu/20 + Ni/60+ Cr/20 + Mo/15 + V/10 + 5B
AWS = C + (Mn+Si)/6 + (Cr + Mo + V)/5 + (Ni + Cu)/15

Plate Tested	Smpl. Loc.	Slab Identity	Gauge Tested	Test Cond	Test Dir.	Yield Point (KSI)	Ten. Stgth. (KSI)	Elong in 2"	YS/UTS Ratio	Yield Strength Determined At
1209615	A	06C	1.2500	AR	T	44	71	26.0%	0.62	0.2%
1209616	A	06D	1.2500	AR	T	46	72	26.0%	0.64	0.2%

Plates Certified For The Above Tests

Material	Thick(IN)	Width (IN)	Len(IN)	Wgt(LB)
1240547B	1.2500	96.000	240.00	8167.680

Material	Thick(IN)	Width(IN)	Len (IN)	Wgt(LB)

Material	Thick(IN)	Width(IN)	Len(IN)	Wgt(LB)

ANTHONY CARDWELL
08/03/2022

Q.A. APPROVED
By Date 5/24/2022

DIN: EN 10204 2004 3.1 This is to certify that the product decribed herein was manufactured, sampled, and tested in accordance with the specifications and requirements in such specifications. Fine Grain, Si-Al Fully Killed Steel. We certify that delivery of this product with the requirement of the specification and purchase order received from customer. DRC Conflict Free. No intentional addition of Pb, Se, S, Hg or B.

Jackie Tamayo 281-383-5325 Jackie.Tamayo@jswsteel.us

MANNESMANN PRECISION TUBES

Inspection Certificate

acc to EN 10204/3.1

Certificate no.: 9220346

Purchaser:	Webco Industries, Inc 74063 Sand Springs OK	Your order no.	10075464
Manufacturer:	Mannesmann Precision Tubes Netherlands B.V. NL-Helmond	Our order no.:	3400033

Product: Seamless cold drawn low-carbon steel heat exchanger and condenser tubes

Specification: (S)A 179 / (S)A 450 / NACE MR0103-05 / NACE MR0175

Steelgrade:	A 179 SA 179	acc. to norm:	A179 SA179	Edition:	2021 2021

Marking: On tubes / On tags

Manufacturer's mark: MPT-HE

Process: Basic oxygen steel

Stamp of the mill's inspector: (Q-MPT-NL)

Steelmarks: (S)A 179 + N

Extent of the delivery:

Shipping no.: 4400608
Our shipping date: 01-06-2022

Item	Numbers	Dimension			Heat no.	Sample no.
10	393	1,250" OD x 0,120" MW x 24'0"	2874,80 m	6673 kg	270569	

Shipping marks:
PO : 10075464
Item : 00001 Line 1
Mat. : A320125012008
Quantity : 393pcs.
Tag Nr. : PO# A22-13312 T-1
ASTM/ASME A/SA 179 SMLS
Grade 1010
OD: 1,2500" Inches
Wall: 0.1200 inches MW Wall
Melting Western Europe
Hot finished tube fabrication in Germany
Cold drawn in The Netherlands
Max. 1 heat per bundle – Max 1 heat per box

	C	Mn	P	S	Cr		Heat no
Requirements	*0,06-0,18*	*0,27-0,63*	*≤0,035*	*≤0,035*			
Heat analysis (%)	0,15	0,51	0,009	0,002	0,03		270569

	Mo	V	Cu	Ni	Sn		Heat no
Requirements							
Heat analysis (%)	0,01	0,001	0,02	0,03	0,001		270569

Heat treatment: Normalized at 920 °C

Remarks: It is certified that the products have been tested in accordance to purchase specifications and found satisfactory

Helmond(NL.) : 30-06-2022

Mannesmann Precision Tubes - NL
Inspector
B. van Lier

ANTHONY CARDWELL
10/24/2022

MANNESMANN PRECISION TUBES

Test results

Certificate no.: 9220346

1. Visual inspection and control of dimensions: OK
2. Eddy current test acc. to: E309: OK
3. Flattening test: OK
   Flaring test: OK
4. Hardness test: OK

Mechanical data	Dimensions of the test tube mm	Hardness HRB
Requirements:		*Mex 72*
1	31,75 x 3,26	66
2		64

Helmond: 30-06-2022

Mannesmann Precision Tubes - NL
Inspector
B. van Lier

ANTHONY CARDWELL
10/24/2022

WORLD ENERGY RENEWABLE FUELS CONVERSION PROJECT
Project No: A8KM
Vendor Input to PCMS
Doc number: A8KM-PCMS-001, Rev. 1

Vendor Doc Number: PCMS_PO Number Rev: 1
EN207119-FAB-9V3-00108 4505606036

Identification					
1: Tag No.	18-XF-352A/B				
2: Model No.					
3: Serial No.	A22-13312-2-3				
4: Registration No.	11567				Code Vessels Only
5: Code Stamped	yes				Drop Down
General Design					
15: Build Date	2024				
17: Manufacturer	FABSCO FIN AIR				
19: General Material	CS				
20: Insulation Type	None				Drop Down
21: Support Type	Baseplate				Drop Down
22: External Coating	Epoxy				Drop Down
23: MAWP (psig)	325				
24: MAWT (F)	600				
25: Design Pressure (psig)	325				
26: Full Vacuum	yes				Drop Down
27: Design Temp (F)	600				
28: MDMT (F)	32				
29: Weight Empty (lbs)	68403				
30: Weight Full (lbs)	72524				
31: Equipment Length (inches)	33'-2"				
32: Orientation	Horizontal				Drop Down
33: Equipment Width (inches)	14'-5"				
34: Equipment Height (inches)	12'-8"				
35: Storage Volume (bbls)	NA				Vessels Only
36: Outer Diameter (inches)	NA				
37: PWHT	yes				
38: Fire Proofing	no				
39: Heat Tracing	None				
40: Test Medium	Water				Pressure Testing