



6830 Leopard
Corpus Christi, TX 78409

(361) 299-1711
(361) 299-1377 FAX

Date: 08/30/2018

Customer: MARATHON OIL

Vessel Description: 48" X 20' X 250#
ASME VERTICAL 2PHASE
SEPARATOR

Serial number: JF-4491

PO# 4500261671

SKID #05
PERMIAN PRODUCTION

**U-1A FORMS & PARTIAL
DATA REPORTS**

FORM U-1A MANUFACTURER'S DATA REPORT FOR PRESSURE VESSELS
Alternate Form for Single-Chamber, Completely Shop- or Field-Fabricated Vessels Only
As Required by the Provisions of the ASME Boiler and Pressure Vessel Code Rules, Section VIII, Division 1

1. Manufactured and certified by Jet Fabrication 6830 Leopard Street Corpus Christi, Texas 78409
 (Name and address of Manufacturer)

2. Manufactured for Marathon Oil
 (Name and address of Purchaser)

3. Location of installation Unknown
 (Name and address)

4. Type Vertical JF-4491 N/A 01-1815-1 Rev.0 2479 2018
 (Horizontal or vertical, tank) (Manufacturer's serial number) (CRN) (Drawing number) (National Board number) (Year built)

5. ASME Code, Section VIII, Division 1 2017 Edition N/A N/A
 [Edition and Addenda, if applicable (date)] (Code Case numbers) [Special service per UG-120(d)]

6. Shell SA-516 70 0.375" 0" 48" O.D 20'-0" S/S
 (Material spec. number, grade) (Nominal thickness) (Corr. allow.) (Inner diameter) [Length (overall)]

Body Flanges on Shells												
No.	Type	ID	OD	Flange Thk	Min Hub Thk	Material	How Attached	Location	Bolting			
									Num & Size	Bolting Material	Washer (OD, ID, thk)	Washer Material
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

7. Seams UW-11 Type 1 Full 1.00% N/A N/A UW-11 Type 1 Spot 1.00% 2
 [Long. (welded, dbl., snl., lap, butt)] [R. T. (spot or full)] (Eff., %) (H. T. temp.) (Time, hr) [Girth (welded, dbl., snl., lap, butt)] [R. T. (spot or full)] (Eff., %) (No. of courses)]

8. Heads: (a) Material SA-516 70 (b) Material SA-516 70
 (Spec. no., grade) (Spec. no., grade)

	Location (Top, Bottom, Ends)	Minimum Thickness	Corrosion Allowance	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side To Pressure (Convex or Concave)
(a)	TOP	0.34"	0"	N/A	N/A	2:1	N/A	N/A	N/A	Concave
(b)	BOTTOM	0.34"	0"	N/A	N/A	2:1	N/A	N/A	N/A	Concave

Body Flanges on Heads												
	Location	Type	ID	OD	Flange Thk	Min Hub Thk	Material	How Attached	Bolting			
									Num & Size	Bolting Material	Washer (OD, ID, thk)	Washer Material
(a)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
(b)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

9. MAWP 250 PSI N/A at max. temp. 150°F N/A
 (Internal) (External) (Internal) (External)
 Min. design metal temp. -20°F at 250 PSI Hydro., pneu., or comb. test pressure 325 PSIG

Proof test N/A

10. Nozzles, inspection, and safety valve openings:

Purpose (Inlet, Outlet, Drain, etc.)	No.	Diameter or Size	Type	Material		Nozzle Thickness		Reinforcement Material	Attachment Details		Location (Insp. Open.)
				Nozzle	Flange	Nom.	Corr.		Nozzle	Flange	
Inlet (C1)	1	6"-150#	RFLWN	SA-105	SA-105	0.875"	0"	Integral	UW-16.1(c)	N/A	Shell
Outlet (C2)	1	3"-3000#	CPLG	SA-105	N/A	0.375"	0"	Integral	UW-16.1(c)	N/A	Shell
Gauge (C3A,B)	1	1/2"-6000#	CPLG	SA-105	N/A	0.33"	0"	Integral	UW-16.1(c)	N/A	Shell
Supply Gas (C4)	1	1/2"-6000#	CPLG	SA-105	N/A	0.33"	0"	Integral	UW-16.1(c)	N/A	Top Head
Drain (C5)	1	2"-150#	RFLWN	SA-105	SA-105	0.218"	0"	Integral	UW-16.1(c)	Type 1	Bottom Head
Outlet (C6)	1	6"-150#	RFLWN	SA-105	SA-105	0.875"	0"	Integral	UW-16.1(c)	N/A	Top Head
Safety Head (C7)	1	2"-3000#	CPLG	SA-105	N/A	0.3125"	0"	Integral	UW-16.1(c)	N/A	Top Head

11. Supports: Skirt Yes Lugs 2 Legs N/A Other N/A Attached Welded to Shell
 (Yes or no) (Number) (Number) (Describe) (Where and how)

12. Remarks: Manufacturer's Partial Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of the report: Item# 6, Shell Cylinder done by Universal Steel America, Inc. Houston U-44,222 SN# 2482 B
 (Name of part, item number, Manufacturer's name and identifying stamp)

Impact test exempt per UCS-66(b)(d)(f)

Mfg. Representative:
Authorized Inspector:

Date: 5-16-18
Date: 5/16/18

FORM U-1A

Page 2 of 2

Manufactured by Jet Fabrication 6830 Leopard Street Corpus Christi, Texas 78409

Manufacturer's Serial No. JF-4491

CRN N/A

National Board No. 2479

CERTIFICATE OF SHOP / FIELD COMPLIANCE

We certify that the statements made in this report are correct and that all details of design, material, construction, and workmanship of this vessel conform to the ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1. "U" Certificate of Authorization Number 35,284

expires 08/19/20

Date 5-16-18

Co. name Jet Fabrication

Signed

(Manufacturer)

(Representative)

CERTIFICATE OF SHOP / FIELD INSPECTION

Vessel constructed by Jet Fabrication

at 6830 Leopard St. Corpus Christi, TX 78409 USA

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and employed by OneCIS Insurance Company of Lynn, MA

have inspected the component described in this Manufacturer's Data Report on 05-14-2018, and state that, to the best of my knowledge and belief, the Manufacturer has constructed this pressure vessel in accordance with ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1. By signing this certificate neither the Inspector nor his/her employer makes any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his/her employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date 05-14-18

Signed

(Authorized Inspector)

Commissions

1613594 (National Board Authorized Inspector Commission number)

FORM U-2A MANUFACTURER'S PARTIAL DATA REPORT (ALTERNATIVE FORM)
A Part of a Pressure Vessel Fabricated by One Manufacturer for Another Manufacturer
As Required by the Provisions of the ASME Boiler and Pressure Vessel Code Rules, Section VIII, Division 1

1. Manufactured and certified by: Universal Steel America, Inc. Houston 1230 East Richey Road Houston, Texas 77073
(Name and address of Manufacturer)

2. Manufactured for: Jet Specialty, Inc. 6830 Leopard Street Corpus Christi, Texas 78409
(Name and address of Purchaser)

3. Location of installation Unknown
(Name and address)

4. Type: Cylinder 2482 A,B -
(Description of vessel part (shell, two piece head, tube bundle)) (Manufacturer's serial number) (CRN)
(National Board number) (Drawing number) (Drawing prepared by) (Year built)
2018

5. ASME Code Section VIII Div 1 2017 - -
[Edition and Addenda, if applicable (date)] (Code Case number) (Special Service per UG-120(d))

6. Shell (a) Number of course (s): 2 (b) Overall Length: 240"

Course(s)			Material	Thickness		Long. Joint (Cat. A)			Circum. Joint (Cat. A, B & C)			Heat Treatment	
No.	Diameter	Length	Spec./Grade or Type	Nom.	Corr.	Type	Full, Spot, None	Eff.	Type	Full, Spot, None	Eff.	Temp.	Time
2	48" OD	120"	SA 516-70	.375"	-	1	Full	-	1	Full	-	None	None
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-

Body Flanges on Shell													
No.	Type	ID	OD	Flange Thk	Min Hub Thk	Material	How Attached	Location	Bolting				Washer Material
									Num & Size	Bolting Material	Washer (OD, ID, thk)	Washer Material	
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-

7. Heads: (a) - (b) -
(Material spec, number, grade or type) (H.T. - time and temp) (Material spec, number, grade or type) (H.T. - time and temp)

	Location (Top, Bottom, Ends)	Thickness		Radius		Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure		Category A		
		Min.	Corr.	Crown	Knuckle					Convex	Concave	Type	Full, Spot, None	Eff.
(a)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(b)	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Body Flanges on Heads													
	Location	Type	ID	OD	Flange Thk	Min Hub Thk	Material	How Attached	Bolting				Washer Material
									Num & Size	Bolting Material	Washer (OD, ID, thk)	Washer Material	
(a)	-	-	-	-	-	-	-	-	-	-	-	-	-
(b)	-	-	-	-	-	-	-	-	-	-	-	-	-

8. MAWP - - at max temp. - - Min. design metal temp. - at -
(Internal) (External) (Internal) (External)

9. Impact Test No at test temperature of -
Indicate yes or no and the component(s) impact tested

10. Hydro, pneu, or comb. test pressure. None PSI Proof Test None

11. Nozzles, inspection, and safety valve openings:

Purpose (Inlet, Outlet, Drain, etc)	No.	Diameter or Size	Type	Material		Nozzle Thickness		Reinforcement Material	Attachment Details		Location (Insp. open.)
				Nozzle	Flange	Nom.	Corr.		Nozzle	Flange	
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

12. Identification of part (s)

Name of Part	Quantity	Line No.	Mfr's Identification No.	Mfr's Drawing No.	CRN	National Board No.	Year Built
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-

13. Support: Skirt - Lugs - Legs - Other - Attached -
Yes or no (Number) (Number) Describe (Where and how)

14. Remarks Jet Specialty PO# FAB8771 USAH WO# 72105-1

2 pcs .375" x 48" OD x 240"

No Hydro Performed, Design By Others, Formed In Accordance With UG-80, UG-79, UCS-79

FORM U-2A

Page 2 of 2

Manufactured by Universal Steel America, Inc. Houston

Manufacturer's Serial No. 2482 A,B

CRN -

National Board No. -

CERTIFICATE OF SHOP/FIELD COMPLIANCE

We certify that the statements made in this report are correct and that all details of material, construction and workmanship of this pressure vessel part conform to the ASME Boiler and pressure Vessel Code, Section VIII, Division 1.

"U" Certificate of Authorization Number

44,222

Expires

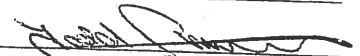
September 27, 2018

Date 03/16/2018

Name

Universal Steel America, Inc. Houston
(Manufacturer)

Signed


(Representative)

CERTIFICATE OF SHOP/FIELD INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and employed by

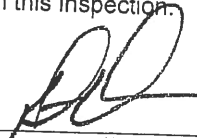
The Hartford Steam Boiler Inspection and Insurance Company

of

Connecticut

have inspected the pressure vessel part described in this Manufacturer's Data Report on 03/16/2018 and state that, to the best of my knowledge and belief, the Manufacturer has constructed this pressure vessel part in accordance with ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1. By signing this certificate neither the Inspector nor his/her employer makes any warranty, expressed or implied, concerning the pressure vessel part described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his/her employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date 03/16/2018 Signed



(Authorized Inspector)

Commissions

12906

(National Board Authorized Inspector Commission number)

5-16-18

5/16/18

MILL TEST REPORTS

FORT WORTH F & D HEAD CO
P.O. BOX 79700
FORT WORTH, TEXAS 76179-0700

COVER SHEET

CUSTOMER JET SPECIALTY		CUSTOMERS P.O. NUMBER FAB8770			DATE 2/23/18	
CODE LETTER	QTY.	SIZE-OD. OR ID.	THICKNESS	PLATE MFG.	HEAT NUMBER	SLAB NUMBER
CKNI	8	48"OD	3/8"NOM	NUCOR	7507207	07
CKNJ	7	48"OD	3/8"NOM	NUCOR	7507208	03
CKJJ	1	48"OD	3/8"NOM	SSAB	W71808	D42

HOT FORMED ☒

MATERIAL SA516-70

STYLE 2:1 ELLIPTICAL

SF: 2"
BEVEL: 30 DEG
DR:
MIN: .34" ✓

OUTSIDE ☒

INSIDE ☐

LAND

ICR

WO# 206471

FORT WORTH F & D HEAD COMPANY CERTIFIES THAT HEADS MANUFACTURED FROM MATERIAL LISTED ON THIS REPORT COMPLY WITH ASME CODE SECTION II & SECTION VIII, DIVISION I. ALL HEADS COMPLY WITH UG-81(a) AND UCS 79.

WE CERTIFY THAT THESE HEADS WERE HOT FORMED ABOVE 1,650 DEGREES FAHRENHEIT, HELD FOR A MINIMUM OF 30 MINUTES, AND AIR COOLED.

Roxanne L. Taylor
FORT WORTH F & D HEAD CO.

NUCOR
PLATE MILL

P.O. Box 279
Winston, NC 27386
(252) 358-5700

Mill Test Report

Page 1

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

NUCOR
By Our Mill

P-34333

Issuing Date: 11/08/2017 BIL No.: 487000 Load No.: 496881 Our Order No.: 1520442 Cust Order No.: 14311
Vehicle No: NOKL 725146 Sold To: RANGER STEEL SERVICES LP 1225 NORTH LOOP W STE 850 HOUSTON, TX 77008 Ship To: RANGER STEEL CO A/R TRUCKING AND STORAGE BNSF TRACK 9813 FT WORTH, TX 76179
Specification: 0.375" x 120.000" x 480.000" ASTM A516 70-10(2015) ASME SA516 70 PVD 2013/2015 Cu .15 Max. Sn .020 Max Normalized Test Coupons at 1650 F NACE MR0175 Annex 2.1.2 (2015), MR0103 (2010) Section 2.1.2 (2015) 13.1.1, 13.1.2(Compliant).

Marking:

Head No	C	Min	P	S	SI	Cu	NI	Cr	Mo	Al(%)	V	Nb	TI	N	Ca	B	Sn	Ceq	Pcm
7507207	0.20	1.02	0.008	0.001	0.20	0.13	0.14	0.09	0.01	0.037	0.004	0.002	0.003		0.0029	0.0001	0.007	0.41	0.27
7507208	0.20	1.03	0.010	0.001	0.19	0.14	0.14	0.06	0.01	0.021	0.004	0.002	0.002			0.0001	0.006	0.40	0.27
Tensile Test																			
Plate Serial No	Pieces	Tons	Dir.	Yield	(psi)	Tensile	Elong. % in 2"	Elong. % in 8"											
7507207-07	6	18.37	T	54,500	79,000	24.0	25.4	25.4	N>CKNI										
7507207-08	6	18.37	T	49,800	74,800	23.3	24.3	24.3	N										
7507208-01	3	9.18	T	62,200	79,800	22.3	26.4	26.4	N										
7507208-02	6	18.37	T	54,500	78,900	23.8	26.3	26.3	N										
7507208-03	6	18.37	T	54,700	79,100	24.0	25.3	25.3	N										

Test coupons only, normalized 60 minutes per inch of thickness at 1650 F ± 25 F. Hold 30 minutes minimum.

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 as-rolled, unless otherwise noted in Specification. For Material Specifications, see: www.nucor.com

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.

Ranger Steel
QC Approved

Yield by U.S. method unless otherwise specified. Ceq = C+(Mn/5)+(Cu+Ni/15)
Pcm = C+(Si/30)+(Mn/20)+(Cu/20)+(Ni/20)+(Mn/5)+(V/10)+B
Melted and Manufactured in the USA. ISO 9001:2008 certified (8010840) by SRI Quality System Registrar (40985-09). PED 9723/EC 712 Annex 1, Para. 4.3 Compliant
DIN 50049 3.1/BEN 10204 3.16(2004), DIN EN 10204 3.1(2005) compliant. For ABS grades only, Quality Assurance certificate 14-MMPQA-723

T.A. Depueble, Metallurgist

11/8/2017 12:03:47 PM

P. 44302
J.D. Q.C. By

NUCOR
PLATE MILL

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

Mill Test Report

Page 1

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

NUCOR
It's Our Nature.

0-34334

Issuing Date : 11/08/2017 B/L No. : 487000 Load No. : 495881 Our Order No. : 1520442 Cust. Order No. : 14311
Vehicle No: NOKL 725146 Sold To: RANGER STEEL SERVICES LP 1225 NORTH LOOP W STE 650 HOUSTON, TX 77008 SHIP TO: RANGER STEEL C/O AHR TRUCKING AND STORAGE BNSF TRACK 9813 FT WORTH, TX 76179
Specification: 0.3750" x 120.000" x 480.000"
ASTM A516 70-10(2015)/ASME SA516 70 PVQ 2013/2016 Cu .15 Max. Sn .020 Max Normalized Test Coupons at 1650 F 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(%)	V	Nb	Ti	N	Ca	B	Sn	Ceq	Pcm
7507207	0.20	1.02	0.008	0.001	0.20	0.13	0.14	0.09	0.01	0.037	0.004	0.002	0.003		0.0029	0.0001	0.007	0.41	0.27
7507208	0.20	1.03	0.010	0.001	0.19	0.14	0.14	0.06	0.01	0.021	0.004	0.002	0.002			0.0001	0.006	0.40	0.27
Tensile Test																			
Plate Serial No	Pieces	Tons	Dir.	Yield	(psi)	Tensile	Elong. % in 2"	Elong. % in 8"											
7507207-07	6	18.37	T	54,500	79,000	24.0	25.4		N										
7507207-08	6	18.37	T	52,700	78,300	23.3	24.3		N										
7507208-01	3	8.18	T	62,200	79,800	22.3	26.4		N										
7507208-02	6	18.37	T	54,500	78,800	23.8	26.3		N										
7507208-03	6	18.37	T	54,700	79,100	24.0	26.3		N										

CKNT

Ranger Steel
QC Approved

Test coupons only, normalized 60 minutes per inch of thickness at 1650 F ± 25 F. Hold 30 minutes minimum. ;
Manufactured to fully rolled 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 as rolled, unless otherwise noted in Specification. For Mexico shipments: rho-Sales@NUCOR.com
Yield by 0.5EUL method unless otherwise specified. Ceq = C+(Mn/5)+(Cr+Mo+V)/5+(Cu+Ni)/15
Pen = C+(Si/30)+(Mn/20)+(Cu/20)+(Nb/50)+(Cr/20)+(As/15)+(V/10)+S
Marked and Manufactured in the USA. ISO 9001:2008 certified (#010940) by SRI Quality System Registrar (#0985-09). PED 97/23/EC 712 Annex 1, Para. 4.3 Compliant.
DIN 50048 3.1, B1EN 10204 3.1B(2004), DIN EN 10204 3.1(2005) compliant. For ABS grades only. Quality Assurance certificate 14-MMPQA-723

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. Depreis, Metallurgist
06 44302

Q.C. By J.D.
11/08/2017 12:03:47 PM

X-RAY READER SHEETS

PAINT COATING PROCESS



COATING INSPECTION REPORT

JOB# 01-1815
SERIAL# # 5 JF-4491
ITEM: 48"X20' SEP

JOB NAME MARATHON

DATE
5/16/2018

TIME
5:00 PM

SURFACE PREPARATION

Metal Surface Temp 80°
Correct Abrasive & Size Y
Compressed Air Clean & Dry Y
Surface Free of Oil & Grease, Clean & Dry Y

Correct Abrasive Blasting Equipment Y
Abrasive Clean & Dry Y
Nozzle Pressure 130 PSI

Surface
Profile SP-10 NEAR
Specified: WHITE

Profile
Achieved: 2.5

Surface Anchor
Profile 2-3

	<u>TIME</u>	<u>DRY BULB</u> <u>TEMP</u>	<u>WET BULB</u> <u>TEMP</u>	<u>RELATIVE</u> <u>HUMIDITY</u>	<u>DEW POINT</u>	<u>SURFACE</u>
	5:00 PM	88°	75°	54%	69°	89°
	6:30 PM	85°	72°	52%	66°	85°

PAINT APPLICATION

DATE
5/16/2018

TIME
6:30 PM

Compressed Air Clean & Dry Y

Metal Substrate Clean & Dry Y

Primer Applied w/in 4 Hours of Blasting Y

Mixed in Accordance w/ Manuf. Instructions Y

Coating

PRIMER 646 MACROPOXY GRAY

Material Sherwin Williams

Temp 80°

Thinner
#15

Application Method:

Airless Spray _____
Conventional
Spray

X

Roller _____

Other _____

Wet Film Thickness Avg. 7-13

Range 7-13

Dry Film Thickness Avg. 7

Range 5-10

Recoat Time Allowed Between Coats:

Total System Dry Film Thickness 7

Comments

Inspector Enrique Ruiz

DIGITAL COPY OF DATA PLATE



U

W ✓

RT-2.

JB-2479 ✓

CERTIFIED BY **JET FABRICATION**

MAWP INTERNAL 250 ✓ PSI at 150 ✓ °F

MAWP EXTERNAL PSI at °F

MDMT 1 -20 ✓ °F at 250 ✓ PSI

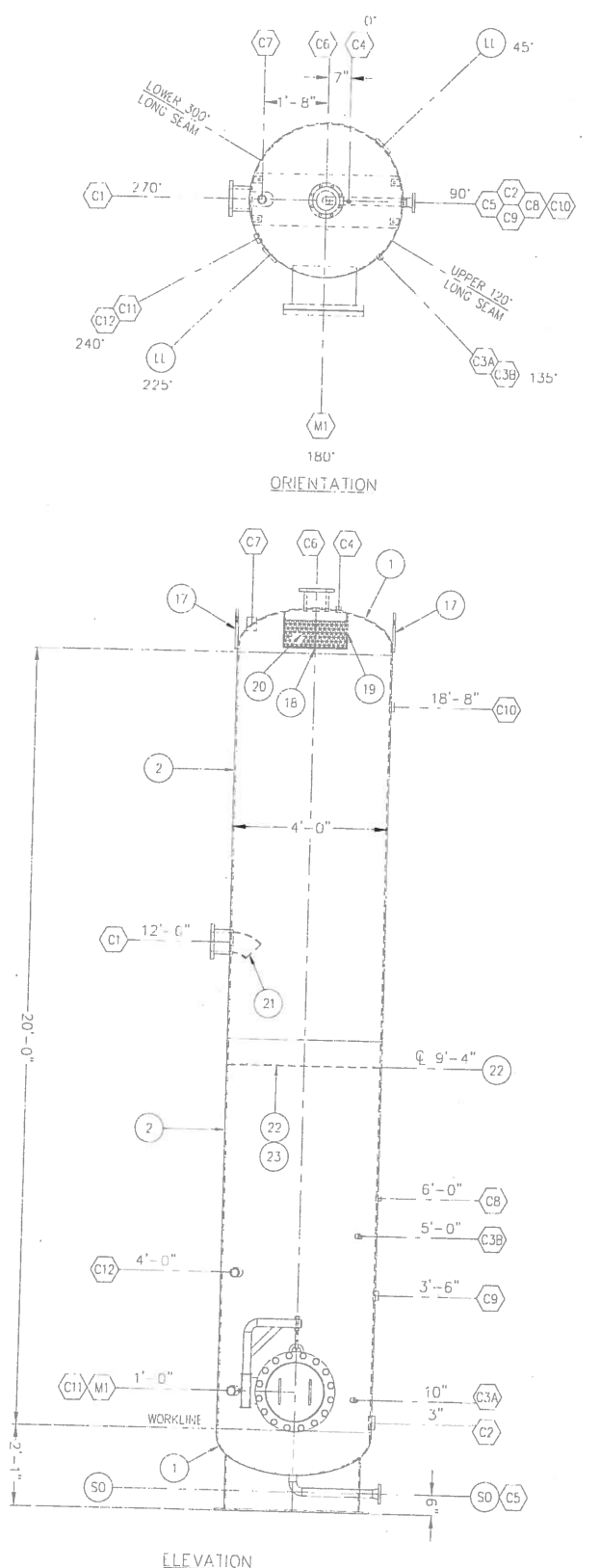
SERIAL NO. JF-4491 ✓

YEAR BUILT 2018 ✓

SIZE 48" O.D. X 240" S/S.

DRAWINGS

BILL OF MATERIAL									
ITEM	QTY	MARK	DESCRIPTION	MATERIAL	ITEM	QTY	MARK	DESCRIPTION	MATERIAL
1	2	WAS	HEAD 2 3/16 DIA (W) 1/2 IN DIA 2 1/4 LIP	SA-118 70	16	1	W	1/2" 10-32 UNC x 3" LONG	SA-105
2					17	2		1/2" 80000 ENG x 2" LONG	
3	2	SOFT	1/2" DIA 1/2" (W) 1/2" (H) 3/8 (D) 1/4 (L)	SA-38	18	4		1/4" LIP 1/2" FLAT BAR 1/2" LONG	SA-108
4	1	SOFT	1/2" DIA 1/2" (W) 1/2" (H) 3/8 (D) 1/4 (L)	SA-38	19	1		SOFTEN 1/2" 1/4" FLAT BAR 1/2" LONG	SA-108
5	1	SOFT	1/2" DIA 1/2" (W) 1/2" (H) 3/8 (D) 1/4 (L)	SA-38	20	1		1/2" 1/4" FLAT BAR 1/2" LONG	SA-108
6	1	C2	1/2" 20000 ENG x 2" LONG	SA-105	21	1		SOFTEN 1/2" 1/4" FLAT BAR 1/2" LONG	SA-108
7	2	SA/CBH	1/2" 80000 ENG x 2" LONG		22	1		SOFTEN 1/2" 1/4" FLAT BAR 1/2" LONG	SA-108
					23	4		1/4" LIP 1/2" FLAT BAR 1/2" LONG	SA-108
					24	1		SOFTEN 1/2" 1/4" FLAT BAR 1/2" LONG	SA-108
					25	1		SOFTEN 1/2" 1/4" FLAT BAR 1/2" LONG	SA-108
					26	1		SOFTEN 1/2" 1/4" FLAT BAR 1/2" LONG	SA-108
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					31	1		SOFTEN 1/2" 1/4" FLAT BAR 1/2" LONG	SA-108
					32	1		SOFTEN 1/2" 1/4" FLAT BAR 1/2" LONG	SA-108
					33	1		SOFTEN 1/2" 1/4" FLAT BAR 1/2" LONG	SA-108
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					36	1		SOFTEN 1/2" 1/4" FLAT BAR 1/2" LONG	SA-108
					37	1		SOFTEN 1/2" 1/4" FLAT BAR 1/2" LONG	SA-108
					38	1		SOFTEN 1/2" 1/4" FLAT BAR 1/2" LONG	SA-108
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					75	1		SOFTEN 1/2" 1/4" FLAT BAR 1/2" LONG	SA-108
					76	1		SOFTEN 1/2" 1/4" FLAT BAR 1/2" LONG	SA-108
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					97	1		SOFTEN 1/2" 1/4" FLAT BAR 1/2" LONG	SA-108
					98	1		SOFTEN 1/2" 1/4" FLAT BAR 1/2" LONG	SA-108
					99	1		SOFTEN 1/2" 1/4" FLAT BAR 1/2" LONG	SA-108
					100	1		SOFTEN 1/2" 1/4" FLAT BAR 1/2" LONG	SA-108



W	1	1/2	15/8	2 1/4	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100																																																																																																																																																																																																																																																																																																																																			
SIZE	1/2	3/4	1	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3	3 1/4	3 1/2	3 3/4	4	4 1/4	4 1/2	4 3/4	5	5 1/4	5 1/2	5 3/4	6	6 1/4	6 1/2	6 3/4	7	7 1/4	7 1/2	7 3/4	8	8 1/4	8 1/2	8 3/4	9	9 1/4	9 1/2	9 3/4	10	10 1/4	10 1/2	10 3/4	11	11 1/4	11 1/2	11 3/4	12	12 1/4	12 1/2	12 3/4	13	13 1/4	13 1/2	13 3/4	14	14 1/4	14 1/2	14 3/4	15	15 1/4	15 1/2	15 3/4	16	16 1/4	16 1/2	16 3/4	17	17 1/4	17 1/2	17 3/4	18	18 1/4	18 1/2	18 3/4	19	19 1/4	19 1/2	19 3/4	20	20 1/4	20 1/2	20 3/4	21	21 1/4	21 1/2	21 3/4	22	22 1/4	22 1/2	22 3/4	23	23 1/4	23 1/2	23 3/4	24	24 1/4	24 1/2	24 3/4	25	25 1/4	25 1/2	25 3/4	26	26 1/4	26 1/2	26 3/4	27	27 1/4	27 1/2	27 3/4	28	28 1/4	28 1/2	28 3/4	29	29 1/4	29 1/2	29 3/4	30	30 1/4	30 1/2	30 3/4	31	31 1/4	31 1/2	31 3/4	32	32 1/4	32 1/2	32 3/4	33	33 1/4	33 1/2	33 3/4	34	34 1/4	34 1/2	34 3/4	35	35 1/4	35 1/2	35 3/4	36	36 1/4	36 1/2	36 3/4	37	37 1/4	37 1/2	37 3/4	38	38 1/4	38 1/2	38 3/4	39	39 1/4	39 1/2	39 3/4	40	40 1/4	40 1/2	40 3/4	41	41 1/4	41 1/2	41 3/4	42	42 1/4	42 1/2	42 3/4	43	43 1/4	43 1/2	43 3/4	44	44 1/4	44 1/2	44 3/4	45	45 1/4	45 1/2	45 3/4	46	46 1/4	46 1/2	46 3/4	47	47 1/4	47 1/2	47 3/4	48	48 1/4	48 1/2	48 3/4	49	49 1/4	49 1/2	49 3/4	50	50 1/4	50 1/2	50 3/4	51	51 1/4	51 1/2	51 3/4	52	52 1/4	52 1/2	52 3/4	53	53 1/4	53 1/2	53 3/4	54	54 1/4	54 1/2	54 3/4	55	55 1/4	55 1/2	55 3/4	56	56 1/4	56 1/2	56 3/4	57	57 1/4	57 1/2	57 3/4	58	58 1/4	58 1/2	58 3/4	59	59 1/4	59 1/2	59 3/4	60	60 1/4	60 1/2	60 3/4	61	61 1/4	61 1/2	61 3/4	62	62 1/4	62 1/2	62 3/4	63	63 1/4	63 1/2	63 3/4	64	64 1/4	64 1/2	64 3/4	65	65 1/4	65 1/2	65 3/4	66	66 1/4	66 1/2	66 3/4	67	67 1/4	67 1/2	67 3/4	68	68 1/4	68 1/2	68 3/4	69	69 1/4	69 1/2	69 3/4	70	70 1/4	70 1/2	70 3/4	71	71 1/4	71 1/2	71 3/4	72	72 1/4	72 1/2	72 3/4	73	73 1/4	73 1/2	73 3/4	74	74 1/4	74 1/2	74 3/4	75	75 1/4	75 1/2	75 3/4	76	76 1/4	76 1/2	76 3/4	77	77 1/4	77 1/2	77 3/4	78	78 1/4	78 1/2	78 3/4	79	79 1/4	79 1/2	79 3/4	80	80 1/4	80 1/2	80 3/4	81	81 1/4	81 1/2	81 3/4	82	82 1/4	82 1/2	82 3/4	83	83 1/4	83 1/2	83 3/4	84	84 1/4	84 1/2	84 3/4	85	85 1/4	85 1/2	85 3/4	86	86 1/4	86 1/2	86 3/4	87	87 1/4	87 1/2	87 3/4	88	88 1/4	88 1/2	88 3/4	89	89 1/4	89 1/2	89 3/4	90	90 1/4	90 1/2	90 3/4	91	91 1/4	91 1/2	91 3/4	92	92 1/4	92 1/2	92 3/4	93	93 1/4	93 1/2	93 3/4	94	94 1/4	94 1/2	94 3/4	95	95 1/4	95 1/2	95 3/4	96	96 1/4	96 1/2	96 3/4	97	97 1/4	97 1/2	97 3/4	98	98 1/4	98 1/2	98 3/4	99	99 1/4	99 1/2	99 3/4	100	100 1/4	100 1/2	100 3/4																							
TYPE	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G	CP-G

SEE SHEET #01-1815-2 FOR DETAIL

[illegible]