

TITAN

Customer

Data Book

INFLECTION ENERGY

SO: 558

WO: 004058

S/N: CLB19-742

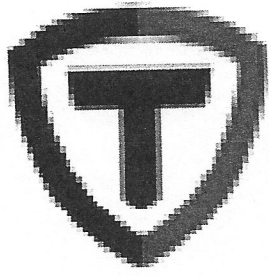
**48"ID X 30'-0" S/S @1440# PACKED
ABSORBER/SCRUBBER**



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SECTION I. VESSEL DATA

SECTION II. DRAWINGS



TITAN

Section I

1. Manufactured and certified by **Titan Production Equipment, LLC, 2207 FM 949, Alleyton, Texas, 78935**
 (Name and address of Manufacturer)

2. Manufactured for **INFLECTION ENERGY LLC**
 (Name and address of Purchaser)

3. Location of Installation **NOT KNOWN**
 (Name and address)

4. Type **Vertical** **CLB19-742** **N/A** **T-1001054-M02 R.1** **868** **2020**
 (Horizontal or vertical, tank) (Manufacturer's serial number) (CRN) (Drawing number) (National Board number) (Year built)

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

6. Shell: **SA516-70N** **2.00 in** **0.0625 in** **48" (ID)** **30'**
 (Material spec. number, grade) (Nominal thickness) (Corr. allow.) (Inner diameter) (Length (overall))

Body Flanges on Shells										Bolting			
No.	Type	ID	OD	Flange Thk	Min Hub Thk	Material	How Attached	Location		Num & Size	Bolting Material	Washer (OD, ID, thk)	Washer Material
1A	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: **TYPE 1** **FULL** **100%** **1100 °F** **2.16** **TYPE 1** **FULL** **100%** **3**
 [Long. (welded, dbl., singl., lap, butt)] [R.T. (spot or full)] [Eff. (%)] [H.T. temp] [Time, hr] [Girth, (welded, dbl., singl., lap, butt)] [R.T. (spot or full)] [Eff. (%)] (No. of courses)

8. Heads: (a) Material **SA516-70N** (Spec. no., grade) (b) Material **SA516-70N** (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	1.875"	0.0625"	N/A	N/A	2:1	N/A	N/A	N/A	CONCAVE
b)	BOTTOM	1.875"	0.0625"	N/A	N/A	2:1	N/A	N/A	N/A	CONCAVE

Body Flanges on Heads										Bolting			
Location	Type	ID	OD	Flange Thk	Min Hub Thk	Material	How Attached			Num & Size	Bolting Material	Washer (OD, ID, thk)	Washer Material
1)	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

9. MAWP **1440 psi** **N/A** at max. temp. **130 °F** **N/A**
 (Internal) (External) (Internal) (External)
 Min. design metal temp. **-20 °F** at **1440 psi** Hydro, pneu., or comb. test pressure **HYDRO at 2160 psi**

Proof test **N/A**

1. 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/OUTLET	2	12" 600#	RFLWN	SA-105N	N/A	1.88"	0.0625"		WELDED	N/A	HEAD/SHELL
/L CONTROL/INLET/OUTLET/DIFF PRESSU	6	2"	TOC	SA-105	N/A	3000#	0.0625"		WELDED	N/A	SHELL
UTLET/DRAIN/RELIEF VALVE/BLOWDOWN	5	1"	CPLT	SA-105	N/A	6000#	0.0625"		WELDED	N/A	SHELL
TEMP INDICATOR/GUGE GLASS	5	3/4"	CPLT	SA-105	N/A	6000#	0.0625"		WELDED	N/A	SHELL
PRESSURE INDICATOR	1	1/2"	CPLT	SA-105	N/A	6000#	0.0625"		WELDED	N/A	SHELL
MANWAY/W/BLIND, DAVIT	1	18" 600#	RF HB	SA-350-LF2	N/A	2.60"	0.0625"		WELDED	N/A	SHELL

1. Supports: Skirt **YES** Lugs **3** Legs **N/A** Other **BASE PLATE** Attached **WELDED TO HEADS AND SHELL**
 (Yes or no) (Number) (Number) (Describe) (Where and how)

2. Remarks: Manufacturer's Partial Data Reports properly identified and signed by Commissioned Inspectors, have been furnished for the following items of the report:

N/A
 (Name of part, item number, Manufacturer's name and identifying stamp)

PAUT IN LIEU OF RT ON LONG SEAM AND ROUND SEAM
FOR NON-LETHAL SERVICE
IMPACT TESTED TO -20 °F PER UG-84

Manufactured by Titan Production Equipment, LLC, 2207 FM 949, Alleyton, Texas, 78935
 Manufacturer's Serial No. CLB19-742 CRN N/A National Board No. 868

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 56617
 expires October 23, 2021

Date 03/31/2020 Co. name Titan Production Equipment, LLC Signed [Signature]
 (Manufacturer) (Representative)

CERTIFICATE OF SHOP/FIELD INSPECTION

Vessel constructed by Titan Production Equipment, LLC at 2207 FM 949, Alleyton, Texas, 78935
 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 March 10, 2020, 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 04/01/2020 Signed [Signature] Commissions 16118
 (Authorized Inspector) (National Board Authorized Inspector Commission number)



PRESSURE VESSEL TRAVELER

Application Code: ASME Section VIII, Div. 1 X, Div. 2 _____

Date: 12/03/2019

Vessel Serial #: CLB19-742

Drawing #: T-1001054-M01 REV 0

Description: 48" ID X 30'-0" S/S @1440# PACKED ABSORBER/SCRUBBER
W/12" 600# RF INLET & OUTLET

MAWP & MDMT: 1440 @ 130° / -20 @ 1440

Description WPS

Radiography: RT-1
 Other N.D.E.: MT/PT ON NOZZLE WELDS, LIFT LUG, SKIRT TO HEAD
 Heat Treatment: YES
 Time & Temp.: 1100° @ 130 MIN
 Hydro Pressure: 2160 W/ 30 MIN CHART
 Gauge Serial #: _____
 National Board #: 868
 Customer Name: INFLECTION ENERGY
 WIP Job No./Tag: 004058-000
 Impact Requirement: -20

Girth & LS A: gfs_11-12_N_ahV-20, gfs_11-12_pw_ac-20
 Noz & Cplg to Shell B: s2 1-1 N_NA_Nh-40AC, s 1-1 N_NA_Nh
 Misc. C: gf 1-1 N_a_h
 Nameplate D: gf 81-11 N_av-50
 Repairs E: mm 1-1 N_a_h, gf 1-1 N_a_h

Additional Notes:
CORROSION ALLOWANCE: 0.0625"

Step No.	Hold Point Description	Initial/Stencil	Date	Hold Point	Comments	See Remarks
1.0 - AUTHORIZED INSPECTOR HOLD POINTS						
1.1	Review Design Calculation & Drawing			AI		<input type="checkbox"/>
1.2	Review WPS's & PQR's			AI		<input type="checkbox"/>
1.3	Review N.D.T. Requirements			AI		<input type="checkbox"/>
1.4	Internal Final Prior to Installation of Heads			AI		<input type="checkbox"/>
1.5	Review Radiographs and/or UT Reports			AI		<input type="checkbox"/>
1.6	Vessel Hydro			AI		<input type="checkbox"/>
1.7	Review ASME Data Report (Including data package i.e. MTRs, PWHT, etc.)			AI		<input type="checkbox"/>
2.0 - FABRICATION HOLD POINTS						
2.1	Verify Correct Heads Assigned to Job			QC		<input type="checkbox"/>
2.2	Layout			QC		<input type="checkbox"/>
2.3	Internals Fit-up Prior to Welding	Ring 1- <u>EH</u>	<u>E7</u> 1-27-20	MFG		<input type="checkbox"/>
2.4	Nozzle & Cplg. to Head Fit-up		<u>WH</u> 1-16-19	QC		<input type="checkbox"/>
2.5	Internal Cleanliness	Ring 1- <u>EH</u>	<u>E7</u> 1-27-20	MFG		<input type="checkbox"/>
2.6	Internal Final Prior to Installation of Heads		<u>WH</u> 1-15-20	QC		<input type="checkbox"/>
2.7	MFG Head to Shell & Girth Seam Fit-up		<u>E7</u> 1-27-20	MFG		<input type="checkbox"/>
2.8	QC Head to Shell & Girth Seam Fit-up		<u>JC</u> 1-16-20	QC		<input type="checkbox"/>
2.9	Nozzle & Cplg. to Shell Fit-up	Ring 1- <u>EH</u>	<u>E7</u> 1-27-20	MFG		<input type="checkbox"/>
2.10	Hardness Testing Required - NO / YES Complete		<u>N/A</u>	QC		<input type="checkbox"/>
2.11	Saddle and Sump Fit-up		<u>N/A</u>	QC		<input type="checkbox"/>
2.12	MFG Final (Clean/Level/Visual/Dimensional/Welder ID/Nameplate/Pipe Weld)		<u>E7</u> 1-27-20	MFG		<input type="checkbox"/>
2.13	QC Final (Clean/Level/Visual/Dimensional/Welder ID/Nameplate/Pipe Weld)		<u>WH</u> 1-28-20	QC		<input type="checkbox"/>
3.0 - NON DESTRUCTIVE TESTING						
3.1	Review Radiographs/Reader Sheets			QC		<input type="checkbox"/>
3.2	Magnetic Particle Testing (MT)			QC		<input type="checkbox"/>
3.3	Ultrasonic Testing (UT)			QC		<input type="checkbox"/>
3.4	Penetrant Testing (PT)			QC		<input type="checkbox"/>
3.5	Oil Bucket Leak Test (as applicable)			QC		<input type="checkbox"/>
3.6	Vessel Hydro		<u>JC</u> 3-10-20	QC		<input type="checkbox"/>
3.7	Coil Hydro			QC		<input type="checkbox"/>



PRESSURE VESSEL TRAVELER

Vessel Serial #: CLB19-742

Step No.	Hold Point Description	Initial/Stencil	Date	Hold Point	Comments	See Remarks
4.0 - QUALITY CONTROL HOLD POINTS						
4.1	Review Design Calculation & Drawing	EH	12.3.19	QC		<input type="checkbox"/>
4.2	Review WPS's & WPQ's	EH	12.3.19	QC		<input type="checkbox"/>
4.3	Review NDT Requirements	EH	12.3.19	QC		<input type="checkbox"/>
4.4	Materials: Correct Heat #'s, Thickness, Grade, & Certs	EH	3-16-20	QC		<input type="checkbox"/>
4.5	Long Seam Weld NDE Verification	EH	3-16-20	QC		<input type="checkbox"/>
4.6	NCR #			QC		<input type="checkbox"/>
4.7	Nameplate Stamping	EH	3-10-20	QC		<input type="checkbox"/>
4.8	Review ASME Data Report			QC		<input type="checkbox"/>
4.9	Heat Treatment & Documents	EH	2.4.20	QC		<input type="checkbox"/>

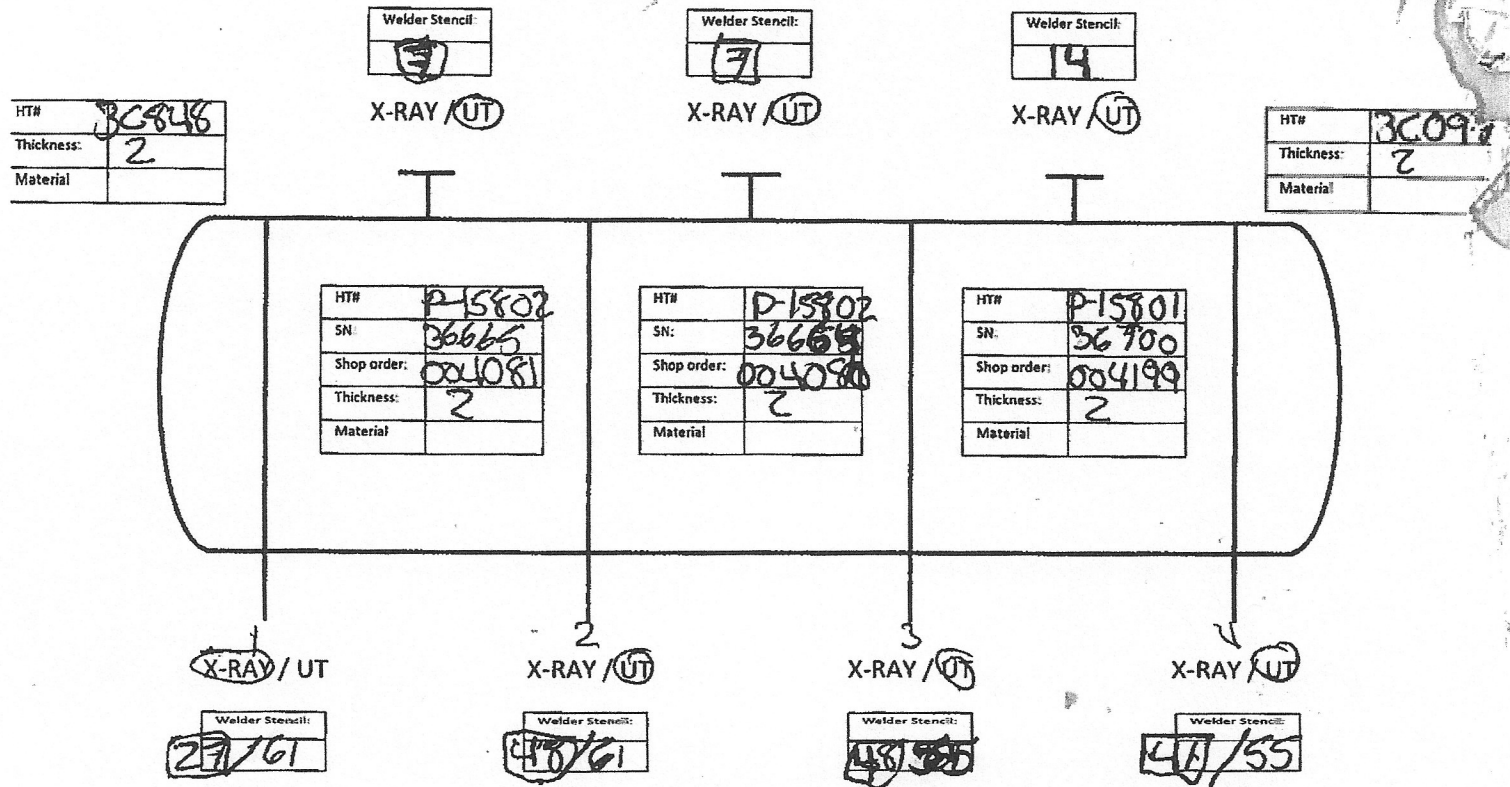
Step No.	BUBBLE CAP TRAY VISUAL CHECKLIST	WELDER STENCIL ID	CHECKED BY
5.0	Bubble Cap Tray #1		
5.0	Bubble Cap Tray #2		
5.0	Bubble Cap Tray #3		
5.0	Bubble Cap Tray #4		
5.0	Bubble Cap Tray #5		
5.0	Bubble Cap Tray #6		
5.0	Bubble Cap Tray #7		
5.0	Bubble Cap Tray #8		
5.0	Bubble Cap Tray #9		
5.0	Bubble Cap Tray #10		

HAT TRAY CHECKLIST	WELDER STENCIL ID	CHECKED BY
HAT TRAY LEAK TEST	19 14	WH 12-16-19
DYE PEN TEST DATE	19 14	WH 12-16-19
ADDITIONAL CHECKS	CHECKED BY	
LEVEL CONTROL VERIFICATION		
REMARKS		
2.2. Ring #1 layout ok JS 12/11/19		
12-13-19 Hat tray tubes fit ok WH		
12-13-19 Top head layout ok WH		
12-18-19 Ring #2 to #3 fit up ok WH		
12-20-19 layout ok N4/N14 on shell #3 ok FZ		
12-31-19 Bottom head fit up ok proceed with weld WH		
1-2-20 Layout of N158 ok WH		
1-2-20 Ring #3 Internal final before mesh support ok WH		
1-3-2020 Ring #3 mesh support bars ok FZ		
1-3-20 Ring #3 Vane hold down bars ok WH		
1-3-20 Top head fit up ok WH		
Ring #1 to Ring #2 fit up ok JS 1-16-2020		

TITAN

SHOP REPORT

CUSTOMER:	INFLECTION ENERGY	Job #:	004058-000
SERIAL NUMBER:	CLB19-742	NATIONAL BOARD NUMBER:	
DESCRIPTION:	48"ID X 30'-0" S/S @1440# PACKED ABSORBER/SCRUBBER		
DRAWING NUMBER:	T-1001054-M01 REV 0		
		TEST PRESSURE:	PSI



Tank Head Manufacturing Complex
 10703 Sheldon Road
 Houston, TX 77044

**UNI-FORM
 COMPONENTS CO.**

(281) 456-9310
 (800) 231-3272 toll-free
 (281) 456-0245 fax



Packlist No PL-98521	Customer ID TIPREQ
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MATERIAL CERTIFICATION

Customer PO No 6116	UCC Job No 144090	Date Cert. Originated 10/24/2019
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Sold To:
 TITAN PRODUCTION EQUIPMENT
 2207 FM 949

Ship To:
 TITAN PRODUCTION EQUIPMENT
 2207 FM 949

-20° Imp

ALLEYTON TX 78935

ALLEYTON TX 78935

Ln	Order Qty	Ship Qty	B/O Qty	Part Description	
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1	<u>2</u>	2	0	HEAD 2:1 ELLIP,48 ID X 2 SA516-70 Unit of Measure: EA	1.875" MIN
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Code: 3C087	HEAT/SLAB: 823C69390 / K054886	GRADE: SA516-70	Size: 2 X 74 X 296	MILL: ARCELOR MITTAL
Code: 3E241	HEAT/SLAB: D6587 / 2	GRADE: SA516-70	Size: 2 X 79 X 316	MILL: ARCELOR MITTAL

0003967000

MILL TEST REPORTS ATTACHED

The chemical and physical properties as indicated on the attached report are the results of the Mill Tests of the raw material used in the manufacture of these products and are certified to meet only the minimum requirements of the ASME and/or ASTM specifications for the material.

1. We hereby certify that these heads were hot formed at the required normalizing temperature and air cooled, in accordance with all applicable specifications.
2. We hereby certify that these heads comply with tolerances of UG-81 of ASME Section VIII, Div. 1.

WE HEREBY CERTIFY THAT THIS REPORT COVERING THE ABOVE AND ATTACHED INFORMATION IS TRUE AND CORRECT AS SHOWN AND CONTAINED IN OUR RECORDS.

John Sattler

Quality Control

11

ArcelorMittal Burns Harbor Plate

US HWY 12 Burns Harbor, Indiana

QUALITY ASSURANCE
REPORT OF TEST AND ANALYSES

SHIPMENT NO. 803-39862	DATE SHIPPED 10-13-18	CAR OR VEHICLE NO. CSS-CRGO-UP	LMIC 007057	PAGE 1
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S O L D T O	UNI-FORM COMPONENTS CO 10703 SHELDON RD HOUSTON TX 77044-6003	S H I P T O	UNI-FORM COMPONENTS CO THEIR SIDING HOUSTON TX

S E R I A L N O.	P A T N O.	H E A T N O.	N O. P C S.	T H I C K N E S S			W E I G H T	Y I E L D P O I N T	T E N S I L E S T R E N G T H	A F F R A C. E L O N G.	R E D.
				INCHES	INCHES	INCHES					

QUALITY STEEL MELTED & MANUFACTURED IN THE U. S. A.
 PLATES - ASME SA516 GR 70 PVQ 2017 EDITION
 MOD CU.15 MAX SN.02 MAX RLD FINE
 GRAIN PRAC --- GAS CUT 4 SIDES MILL
 TEST PCS NORM 1650F FOR 1HR/IN
 AIRCL --- TEST CERTS ARE PREPARED
 IN ACCORD WITH PROCEDURES OUTLINED
 IN EN 10204:2004 TYPE 3.1
 NO WELD REPAIR WAS PERFORMED ON BELOW PLATE(S)
 MFST - MFST PFI 0075651- 0001 MFST TEST CERTS ARE
 PREPARED IN ACCORD WITH PROCEDURES OUTLINED IN
 EN MFST 10204:2004 TYPE 3.1

30095-091

- LIFT MAX 10
 TON UNLDG FORK LIFT-SIDE
 CO# 35811A GH 353-2281B

TEST SPECIMENS LABORATORY HEAT TREATED AND YIELD STRENGTH @ .5% E.U.L.

K054894	811C05560	1	2	74	296	12424	48800	74800	2	34	30095
K054866	821C08390	1	2	74	296	12424	49800	74400	2	36	30091
K054896	823C69390	1	2	74	296	12424	48800	73800	2	35	30097

Q-QUENCH TEMPERATURE	T-TEMPERATURE	N-NORMALIZE TEMPERATURE
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S E R I A L N O.	P A T N O.	H E A T N O.	H A R D B H N	B E N D	T H I C K N E S S I N C H E S	T Y P E	S I Z E	O R I E N T A T I O N	T E M P E R A T U R E	C H A R P Y I M P A C T								
										E N E R G Y F T L B S			S H E A R T E N			L A T E X M I L E		

H E A T N O.	C H E M I C A L A N A L Y S E S																	M I C R O G R A N S I Z E
	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V	Ti	Al	B	Ca	N	BH		
811C05560	.17	1.08	.012	.004	.316	.028	.01	.12	.080	.001	.002	.026	.0002	.002	.005	.004		
821C08390	.17	1.12	.013	.005	.347	.019	.01	.12	.081	.003	.002	.034	.0002	.002	.004	.003		
823C69390	.17	1.06	.013	.003	.308	.019	.01	.12	.077	.001	.002	.031	.0002	.002	.006	.001		

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.

ANDREW SMITH PER ELJ

SMPLTRPT.TF SUPV. QUALITY ASSURANCE



GOOLSBY TESTING, INC.
 2620 WILSON ROAD - P.O. BOX 1416
 HUMBLE, TEXAS 77347-1416
 (281) 540-1266 FAX (281) 540-8126

CLIENT: UNIFORM COMPONENTS	DATE RECEIVED: 7-12-19
10783 SHELDON RD.	DATE TESTED: 7-18-19
HOUSTON, TEXAS 77044	REPORT DATE: 7-18-19
PURCHASE ORDER: 148387	LABORATORY TEST NO: 19-07-130994
GT# :8943 SHOP ORDER#:142277	PROCEDURE: #18 #18
HEAT #1 : 3C784 HEAT #2 : 3C097	LIGHTING: 30BFC
HUMIDITY: 37.4	TEMP: 67.6°F
ENVIRONMENTAL CONDITIONS: SP: 28.9	
MATERIAL THICKNESS: 2"	
MATERIAL/DESCRIPTION: SA516-70N & SPWHT WELDED PLATE	
SPECIFICATIONS: ASME BECT VIII DIV 1	
SPECIAL REQUIREMENTS: N/A	

CHARPY IMPACT TEST

TESTING MACHINE: BALDWIN GATEC 61-1 K3 S/N 1706					
LINEAR VELOCITY OF HAMMER: 17 FT/SEC.			TEST METHOD: SIMPLE BEAM CHARPY		
COOLANT BATH: FTS SYSTEMS S/N G8-1			EFFECTIVE ENERGY: 300 FTLBS/406.7 JOULES		
SPECIMEN TYPE: ASTM TYPE A LVNC			SPECIMEN SIZE: 10 MM X 10 MM		
SPECIMEN TEMP: -20° F			ACCEPTANCE CRITERIA: 18/12 FTLBS.		
SPECIMEN LOCATION	WIDTH	EFFECTIVE SECTION SIZE	IMPACT VALUES FOOT POUNDS	% SHEAR FRACTURE	LATERAL EXPANSION
TOP WELD	.394	.316	270	80	.076
TOP WELD	.394	.316	278	80	.077
TOP WELD	.394	.316	283	80	.088
MID WELD	.394	.316	94	30	.088
MID WELD	.394	.316	113	40	.091
MID WELD	.394	.316	49	20	.046
BASE 1	.394	.316	44	20	.041
BASE 1	.394	.316	31	10	.029
BASE 1	.394	.316	31	10	.029
1/4T TOP HAZ 1	.394	.316	49	20	.046
1/4T TOP HAZ 1	.394	.316	29	10	.024
1/4T TOP HAZ 1	.394	.316	122	40	.102
1/4T BOTTOM HAZ 1	.394	.316	146	60	.098
1/4T BOTTOM HAZ 1	.394	.316	66	20	.066
1/4T BOTTOM HAZ 1	.394	.316	39	20	.038
BASE 2	.394	.316	48	20	.046
BASE 2	.394	.316	64	20	.066
BASE 2	.394	.316	40	20	.034
1/4T TOP HAZ 2	.394	.316	60	20	.062
1/4T TOP HAZ 2	.394	.316	66	30	.079
1/4T TOP HAZ 2	.394	.316	77	30	.081
1/4T BOTTOM HAZ 2	.394	.316	88	20	.047
1/4T BOTTOM HAZ 2	.394	.316	37	20	.034
1/4T BOTTOM HAZ 2	.394	.316	42	20	.038

MATERIALS TESTED ARE: ACCEPTABLE REJECTABLE RECORDABLE

TECHNICIAN:	GOOLSBY TESTING, INC.
CHARLES WILLIAMS	PER: <i>William R. K. Goolsby</i> APPROVED SIGNEE
Accepted by:	Company:

Our letters and reports are for the use of our client to whom they are addressed. Our name may be used only with our prior written approval. Our letters and reports apply only to the sample tested and/or inspected, and do not necessarily represent the quality of other, apparently similar or identical materials. The results recorded represent opinions only and are not to be considered as warranties or guarantees of quality, classification or usability of material examined. In no event shall the liability of Goolsby Testing, Inc. as to any items inspected or tested (including liability as to selection and/or results of such tests) exceed the charge of Goolsby Testing, Inc. for the inspection of such items. We shall assume no responsibility following the acceptance by the customer's field representative upon signing of field ticket. Goolsby Testing reporting and certification are completed in accordance with ISO 17025.

Tank Head Manufacturing Complex
 10703 Sheldon Road
 Houston, TX 77044

**UNI-FORM
 COMPONENTS CO.**

(281) 456-9310
 (800) 231-3272 toll-free
 (281) 456-0245 fax

Packlist No. PL-98188		Customer ID TIPREQ
Customer PO No. 5885	UCC Job No. 143958	Date Cert. Originated 10/9/2019

MATERIAL CERTIFICATION

Sold To:
 TITAN PRODUCTION EQUIPMENT
 2207 FM 949

Ship To:
 TITAN PRODUCTION EQUIPMENT
 2207 FM 949

INSPECTED BY
 AG
 10-10-19

ALLEYTON TX 78935

ALLEYTON TX 78935

Ln	Order Qty	Ship Qty	B/O Qty	Part Description
----	-----------	----------	---------	------------------

1 4 4 0 HEAD 2:1 ELLIP, 48 ID X 2 SA516-70
 Unit of Measure: EA

1-7/8" min
 1.875" MIN

SO1

Code: 3C832	HEAT/SLAB: S27089 / 06B1	GRADE: SA516-70	Size: 2 X 124 X 248	MILL: JSW
Code: 3C848	HEAT/SLAB: S27083 / 06B1	GRADE: SA516-70	Size: 2 X 124 X 248	MILL: JSW
Code: 3C662	HEAT/SLAB: D5243 / 03	GRADE: SA516-70	Size: 2 X 123 X 484.75	MILL: ARCELOR MITTAL

MILL TEST REPORTS ATTACHED

The chemical and physical properties as indicated on the attached report are the results of the Mill Tests of the raw material used in the manufacture of these products and are certified to meet only the minimum requirements of the ASME and/or ASTM specifications for the material.

1. We hereby certify that these heads were hot formed at the required normalizing temperature and air cooled, in accordance with all applicable specifications.
2. We hereby certify that these heads comply with tolerances of UG-81 of ASME Section VIII, Div. 1.

WE HEREBY CERTIFY THAT THIS REPORT COVERING THE ABOVE AND ATTACHED INFORMATION IS TRUE AND CORRECT AS SHOWN AND CONTAINED IN OUR RECORDS.

John Satt

Quality Control

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

METALLURGICAL TEST REPORT

MET - 04 Rev. No.: 3 Rev. Date: 02/27/2018

3/20/2019

Order Item	Met	PO No.	Shipping Mode	Order Dimensions	Slab Origin	ITC No.
T051877	JSW12059-08	SZ7093 390254	TRUCK	2x12x248		TU51877-7083-1
Plates Certified for the Following Grades		Specifications		Marking Instructions		
ASME SA516-70 2017 EDITION, A516		TEST NORMALIZED AT 1650 °F FOR 60 MINS*		Stencils in 2 locations; X Loc. 18 Y Loc. 30; CUST. MADE IN USA FN PO; DIM GRADE: FREIGHT ORDER ITEM PLATED SHIPWEEK SLAB ID; TRANSMODE Stamp in 2 locations; X Loc. 18 Y Loc. 12; Slab ID; Slab ID; Slab ID		
Hot Rolled Carbon Steel Plates		Sold To: JINIFORM COMPONENTS CO. 16969 OLD BEAUMONT HWY 90 HOUSTON, TX 77049				
Plates Manufactured in the USA		Ship To: JINIFORM COMPONENTS CO. 10703 SHELDON RD. HOUSTON, TX 77044				

TABLE 0.23 1.17 0.015 0.005 0.20 0.030 0.010 0.020 0.000 0.000 0.039 0.0040 0.004 0.0000 0.001 0.001 0.0028 0.43

Test	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	Sn	Al	N	V	B	Ti	Nb	Ca	CE
------	---	----	---	---	----	----	----	----	----	----	----	---	---	---	----	----	----	----

Carbon Equivalent CE = C + Mn/8 + (Cr + Mo + V)/5 + (Ni + Cu)/15
PCM = C + S/30 + Mn/20 + Cu/20 + Ni/60 + Cr/20 + Mo/15 + V/10 + 5B

Slab Identity	Plate
1118399A 06B1	
1118399A 06B1	

Gauge Tested	Test Cond	Test Dir.	Yield Point	Tensile	Elong. in 2"	YS/UTS Ratio	Yield Strength Determined At
2.0000	AR	T	49	79	29.0%	0.62	0.2%
2.0000	7N	T	54	79	28.0%	0.66	0.2%

Plates Certified For The Above Tests

Material	Thickness (in)	Width (in)	Length (in)	Weight (lb)
1118399A	2.0000	124.000	248.00	17442.534

Material	Thickness (in)	Width (in)	Length (in)	Weight (lb)

DIN: EN 10204 2004 3.1 This is to certify that the product described 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 Confid Free. Does not contain Hg.

Lorena Barron

Lorena Barron 281-383-5325 Lorena.barron@jswsteel.us
Page 1 of 1





GOOLSBY TESTING, INC.

2620 WILSON ROAD - P.O. BOX 1416
HUMBLE, TEXAS 77347-1416

(281) 540-1255 FAX (281) 540-8126

CLIENT: UNIFORM COMPONENTS	DATE RECEIVED: 9-27-19
10703 SHELDON RD.	DATE TESTED: 9-30-19
HOUSTON, TEXAS 77044	REPORT DATE: 9-30-19
PURCHASE ORDER: 148841	LABORATORY TEST NO: 19-09-132600
GT#: 9549 SHOP ORDER#: 143958	PROCEDURE: #15 #16
HEAT #: 3C848 SLAB #: N/A	LIGHTING: 206FC
HUMIDITY: 39.5	TEMP: 69.6°F
ENVIRONMENTAL CONDITIONS: BP: 30.0	
MATERIAL THICKNESS: 2"	
MATERIAL/DESCRIPTION: SA516-70N	
SPECIFICATIONS: ASME SECT. VIII DIV.1	
SPECIAL REQUIREMENTS: ALL HEAT TREAT PERFORMED BY UCC	

CHARPY IMPACT TEST

TESTING MACHINE: BALDWIN SATEC S1-1 K3 S/N 1706					
LINEAR VELOCITY OF HAMMER: 17 FT/SEC.			TEST METHOD: SIMPLE BEAM CHARPY		
COOLANT BATH: FTS SYSTEMS S/N G6-1			EFFECTIVE ENERGY: 300 FT/LBS./406.7 JOULES		
SPECIMEN TYPE: ASTM TYPE A LVNC			SPECIMEN SIZE: 10 MM X 10 MM		
SPECIMEN TEMP: -20° F			ACCEPTANCE CRITERIA PER UCC 15/12 FT/LBS		
SPECIMEN LOCATION	WIDTH	EFFECTIVE SECTION SIZE	IMPACT VALUES FOOT POUNDS	% SHEAR FRACTURE	LATERAL EXPANSION
BASE	.394	.315	59	20	.051
BASE	.394	.315	48	20	.043
BASE	.394	.315	67	20	.058

MATERIALS TESTED ARE: [] ACCEPTABLE [] REJECTABLE [] RECORDABLE

TECHNICIAN:		GOOLSBY TESTING, INC.	
SEAN PINKERTON		PER:	<i>William R.K. Goolsby</i>
		APPROVED SIGNEE	
Accepted by:		Company:	


Our letters and reports are for the use of our client to whom they are addressed. Our name may be used only with our prior written approval. Our letters and reports apply only to the sample tested and/or inspected, and do not necessarily represent the quality of other apparently similar or identical materials. The results recorded represent opinions only and are not to be considered as warranties or guarantees of quality, classification or usability of material examined. In no event shall the liability of Goolsby Testing, Inc. as to any items inspected or tested (including liability as to selection and/or results of such tests) exceed the charge of Goolsby Testing, Inc. for the inspection of such items. We shall assume no responsibility following the acceptance by the customer's field representative upon signing of field ticket. Goolsby Testing reporting and certification are completed in accordance with ISO 17023.

Griffin Trade Group, LLC

Phone: 281-970-6030
 Fax: 281-970-6024

12777 Jones Rd. Suite 315
 Houston, TX 77375

UT CERTIFIED TEST REPORT


Date Received: 5/13/19		Specification: SA578 LVL C 100% Scan		Report #: GTG-UT-704																									
Date Complete: 5/13/19		Procedure: Griffin Trade Group UT-01		Rev. Release# GTC143483																									
Material: SA/A516-70 N		Deviation: N/A		Page 1 of 1																									
Dimensions: 2x120x480		UT Instrument: RFD 30		Serial#: 12110701																									
Slab #/ID#: 02		Couplant: Water		Calibration Due: 5/15/19																									
Heat #: 9501731		Batch #: N/A		RESULTS																									
Surface: ROUGH		Reject: 0		Acceptable: 1																									
<table border="1"> <thead> <tr> <th colspan="6">CALIBRATION BLOCKS</th> </tr> <tr> <th>DBS</th> <th>Calibration</th> <th>Serial #</th> <th>Reflector size</th> <th>Serial #</th> <th>Brand</th> <th>Size</th> <th>Degree</th> <th>Frequency</th> </tr> </thead> <tbody> <tr> <td>79</td> <td>80% FSH</td> <td>N/A</td> <td>1/8" FBH</td> <td>B14808</td> <td>Britek</td> <td>1"</td> <td>0</td> <td>2.25 Mhz</td> </tr> </tbody> </table>						CALIBRATION BLOCKS						DBS	Calibration	Serial #	Reflector size	Serial #	Brand	Size	Degree	Frequency	79	80% FSH	N/A	1/8" FBH	B14808	Britek	1"	0	2.25 Mhz
CALIBRATION BLOCKS																													
DBS	Calibration	Serial #	Reflector size	Serial #	Brand	Size	Degree	Frequency																					
79	80% FSH	N/A	1/8" FBH	B14808	Britek	1"	0	2.25 Mhz																					
<p>Comments:</p> <p>Transducer → Sound</p> <p>Technique Used</p> <p>Part</p>																													
<p>All tests are performed using calibrated equipment on samples provided by Griffin Trade Group, unless noted in the data section. This data applies only to samples tested by Griffin Trade Group, LLC. This test report may be reproduced in its entirety without permission from Griffin Trade Group, LLC. All requirements of Griffin Trade Group, LLC Quality Operating Procedures, Dated 1/16/2014 have been fulfilled.</p> <p>Tested By: Jarrod Harris ASNT Level II Date: 5/13/19</p> <p>Signature: </p>																													

Griffin Trade Group, LLC

Phone: 281-970-6030
Fax: 281-970-6024

12777 Jones Rd. Suite 315
Houston, TX 77375

UT CERTIFIED TEST REPORT

Date Received: 5/13/19		Specification: SA578 LVL C 100% Scan		Report #: GTG-JT-704
Date Complete: 5/13/19		Procedure: Griffin Trade Group UT-01		Rev. GTC143483
Deviations: N/A		UT Instrument: RFD 30 Couplant: Water		Page 1 of 1
Batch #: N/A		Heat #: 9501731		Serial#: 12110701 Calibration Due: 5/15/19
Material	Dimensions	Slab #/ID#	Surface	Reject
SA/A516-70 N	2x120x480	02	ROUGH	0
				Acceptable
				1
RESULTS				
CALIBRATION BLOCKS				
DBS	Calibration	Serial #	Reflector size	Serial #
79	80% FSH	N/A	1/8" FBH	B14608
TRANSDUCERS				
Technique Used				
Transducer		Part		
↓ Sound				
Comments:				
All tests are performed using calibrated equipment on samples provided by Griffin Trade Group, unless noted in the data section. This data applies only to samples tested by Griffin Trade Group, LLC. This test report may be reproduced in its entirety without permission from Griffin Trade Group, LLC. All requirements of Griffin Trade Group, LLC Quality Operating Procedures, Dated 1/16/2014 have been fulfilled.				
Tested By: Jarrod Harris		ASNT Level II		Date: 5/13/19
Signature: 				

DYNAMIC LABORATORIES

3650 Underwood ~ La Porte, Texas 77571 ~ USA Phone-281-478-0239 Fax-281-478-0259
 Welder Performance * Welding Procedures * Materials Testing

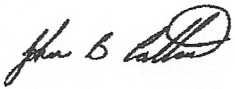
Client : Versa
 Attention : Ernesto Balderas Date : 10/16/2019
 Purchase Order : _____
 Initiated By : John Costlow Lab. No. : MT19-599

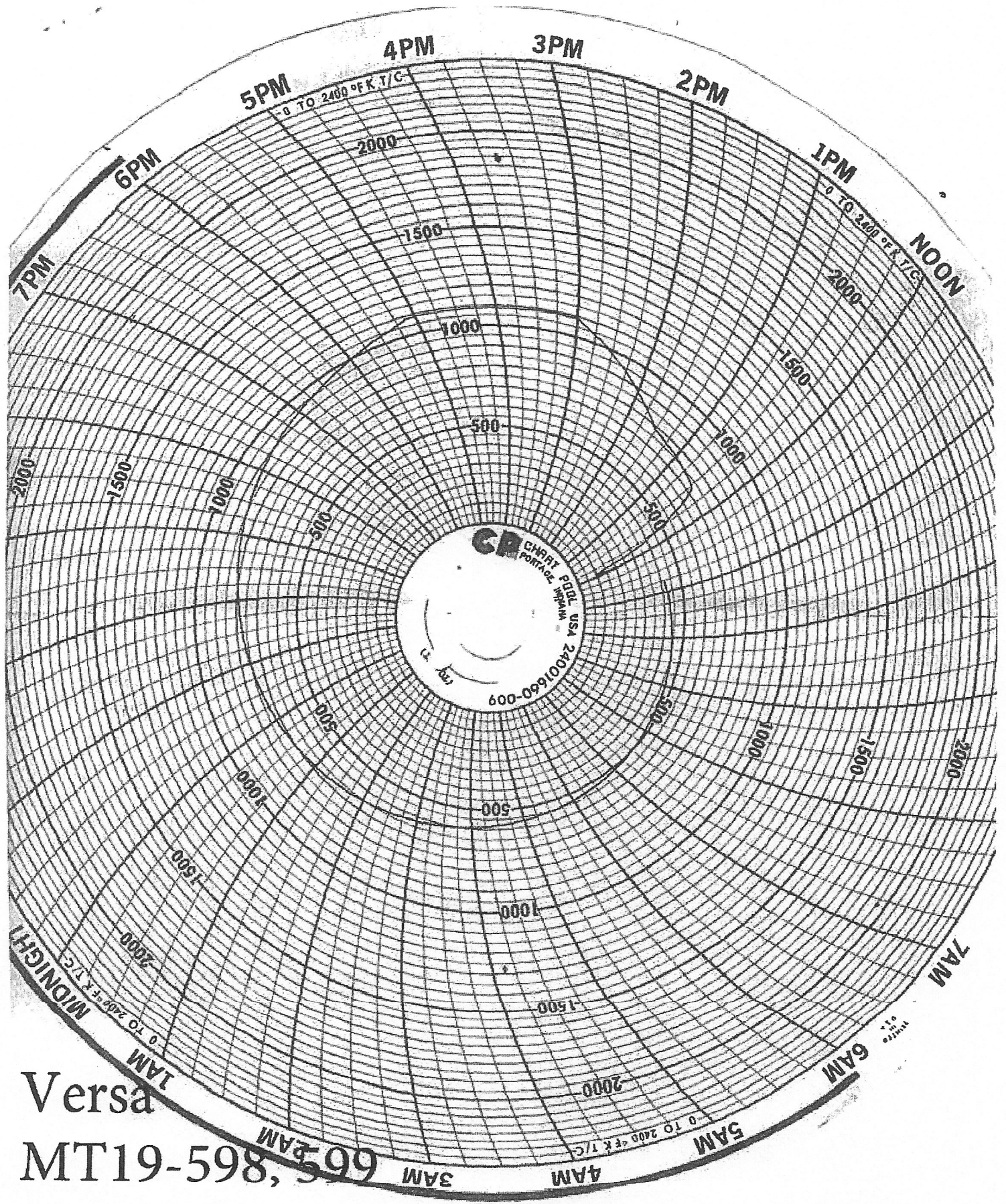
Production Impact testing per ASME SEC VIII UG-84, 2017 Edition

Material Info. : 2" SA516-70N
 Serial#: P-15391 GMAW / FCAW / SAW

Post Weld Heat Treat : 1100°F ± 25° for 2 Hrs.
 Heating Rate : 400°/Hr. Max Cooling Rate : 500°/Hr. Max
 Controlled heating and cooling from 800°F (See chart attached)

ASTM A370 E23 Charpy Impact Tests : 10 x 10 mm x 2v								
Location	Temperature	Fl. / Lbs			Avg.	% Shear	MLS Lateral Expansion	Pass / Fail
Weld	-20°F	83	79	72	78.0	50 - 45 - 45	80 - 75 - 64	Pass
Weld 1/4 T	-20°F	25	65	53	47.7	35 - 45 - 40	24 - 58 - 43	Pass
Haz 1/3T from cap	-20°F	129	167	88	128.0	70 - 90 - 60	92 - 97 - 76	Pass
HAZ 1/3T from root	-20°F	32	80	63	58.3	40 - 60 - 55	32 - 66 - 50	Pass

Dynamic Laboratories, Inc. Rep. : 



Versa
MT19-598, 599
10/10/2019

4301 Hwy.27 South
 Sulphur, LA 70665



{337} 558-6071 Office
 {337} 558-S114 Fax

REFERENCE NUMBER 19110845-301

PHASED ARRAY EXAMINATION REPORT

Customer Name		Titan PEQ		Inspection Date		11/20/2019	
Location		Lay Out		Purchase Order		N/A	
Facility		Alleyton, Tx		Work Order		N/A	
Project Name		4081 36665		Job Number		N/A	
Work Description:		Perform PAUT on 100% of long seam.		Work procedure		VIG-PAUT-01 Rev 1 / Appenic C	
				Acceptance Criteria		ASME Sect VIII Div I	
				Scan Plan ID		VIG-PAUT-SP-033	
Examination Parameters							
Testing Instrument				Probe 1	Probe 2	Probe 3	Probe 4
Manufacturer	Olympus	Make	Olympus	N/A	N/A	N/A	N/A
Model	MX2	Model	5L32-A31	N/A	N/A	N/A	N/A
S/N	Omni2 101793	Frequency	5MHz	N/A	N/A	N/A	N/A
Cal. Date	8/19/2019	Cable Type	Fixed	N/A	N/A	N/A	N/A
Module Model	Omni-MR-32:128	Cable Length	2.5m	N/A	N/A	N/A	N/A
Module S/N	QC-009550	S/N	R1S10	N/A	N/A	N/A	N/A
Cal. Due Date	8/19/2020	Wedge Material	Rexolite	N/A	N/A	N/A	N/A
Software Version	MXU 4.4 R3	Wedge Model	SA10-N55S	N/A	N/A	N/A	N/A
Encoder Information			Wedge Diameter	Flat	N/A	N/A	N/A
			Reference Db	27	N/A	N/A	N/A
Calibration (steps/in)	400.35	Scanning Db	30	N/A	N/A	N/A	N/A
Scan Resolution (in)	0.039"	Sweep Angles	40-72	N/A	N/A	N/A	N/A
Scan Speed (in/sec)	6.00"/ Max	Cal In time	7:00AM	N/A	N/A	N/A	N/A
Last Cal. Date	11/15/2019	Cal Out time	1:00PM	N/A	N/A	N/A	N/A
Calibration verified	Yes	Calibration Blocks Used					
Time Verified	7:30AM	Type	Material	Serial Number			
Scanners Used		Navshop	CS	53141			
		ODI	Scanner Block	CS	TNE-VIG-084		
Lamination Scan performed							
Transverse Scan performed							
				45°	60°	70°	
Result Details			Scan Plans Used (if multiple)				
Total Welds Scanned	1						
Total Welds Accepted	1						
Total Welds Rejected	0						
Total Inches Scanned	117						
Technician (Print)	Brandon Suttle	Level	Level III Review		Customer Approval		
Technician (Signature)	<i>Brandon Suttle</i>	<input checked="" type="checkbox"/> I <input type="checkbox"/> II <input type="checkbox"/> III	(Print)		(Print)		
Other Qualifications	<input checked="" type="checkbox"/> QUTE <input checked="" type="checkbox"/> QUPA <input type="checkbox"/> QUSE <input type="checkbox"/> PCN <input checked="" type="checkbox"/> Other: ASNT # 192157	(Sign)		(Sign)			
		Date:		Date:			

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Sulphur, LA 70665



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REFERENCE NUMBER 19101528-301

PHASED ARRAY EXAMINATION REPORT

Customer Name	Titan PEQ	Inspection Date	10/30/2019
Location	Lay Out	Purchase Order	N/A
Facility	Alleyton, Tx	Work Order	N/A
Project Name	4080 36664	Job Number	N/A

Work Description:	Perform PAUT on 100% of the long seam.	Work procedure	VIG-PAUT-01 Rev 1 / Appendic C
		Acceptance Criteria	ASME Sect VIII Div I
		Scan Plan ID	VIG-PAUT-SP-033

Examination Parameters						
Testing Instrument		Probe 1	Probe 2	Probe 3	Probe 4	
Manufacturer	Olympus	Make	Olympus	N/A	N/A	N/A
Model	MX2	Model	SL32-A31	N/A	N/A	N/A
S/N	Omni2-101793	Frequency	5MHz	N/A	N/A	N/A
Cal. Date	8/19/2019	Cable Type	Fixed	N/A	N/A	N/A
Module Model	Omni-MR-32:128	Cable Length	2.5m	N/A	N/A	N/A
Module S/N	QC-009550	S/N	R1510	N/A	N/A	N/A
Cal. Due Date	8/19/2020	Wedge Material	Rexolite	N/A	N/A	N/A
Software Version	MXU 4.4 R3	Wedge Model	SA31-N555	N/A	N/A	N/A
Encoder Information		Wedge Diameter	Flat	N/A	N/A	N/A
		Reference Db	33.7	N/A	N/A	N/A
		Scanning Db	36.7	N/A	N/A	N/A
Calibration (steps/in)	400.35	Sweep Angles	40-72	N/A	N/A	N/A
Scan Resolution (in)	0.039"	Cal in time	7:00AM	N/A	N/A	N/A
Scan Speed (in/sec)	6.00"/ Max	Cal Out time	1:00PM	N/A	N/A	N/A
Last Cal. Date	10/1/2019					

Calibration verified	Yes	Calibration Blocks Used			
Time Verified	7:30AM	Type	Material	Serial Number	

Scanners Used	Navshop	CS	S3141
ODI	Scanner Block	CS	TNE-VIG-084

Lamination Scan performed			
Transverse Scan performed			
	45°	60°	70°

Result Details	Scan Plans Used (if multiple)		
Total Welds Scanned	1		
Total Welds Accepted	1		
Total Weld Rejected	0		
Total Inches Scanned	117		

Technician (Print)	Brandon Suttle	Level	X	Level III Review	Customer Approval
Technician (Signature)	<i>Brandon Suttle</i>	II	III	(Print)	(Print)
Other Qualifications	<input checked="" type="checkbox"/> QUTE <input checked="" type="checkbox"/> QUPA <input type="checkbox"/> QUSE <input type="checkbox"/> PCN <input checked="" type="checkbox"/> Other: ASNT # 192157	(Sign)	(Sign)	Date:	Date:

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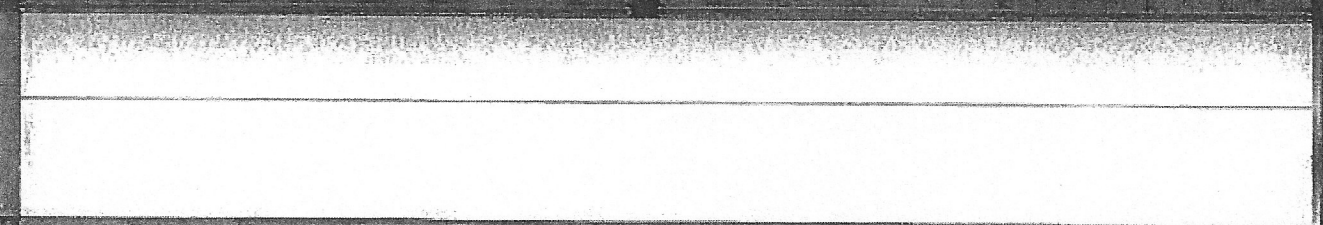
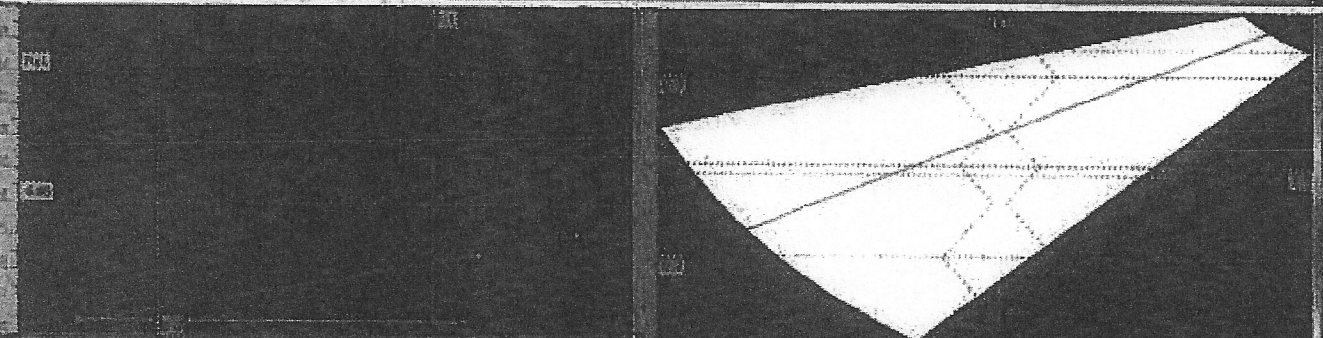
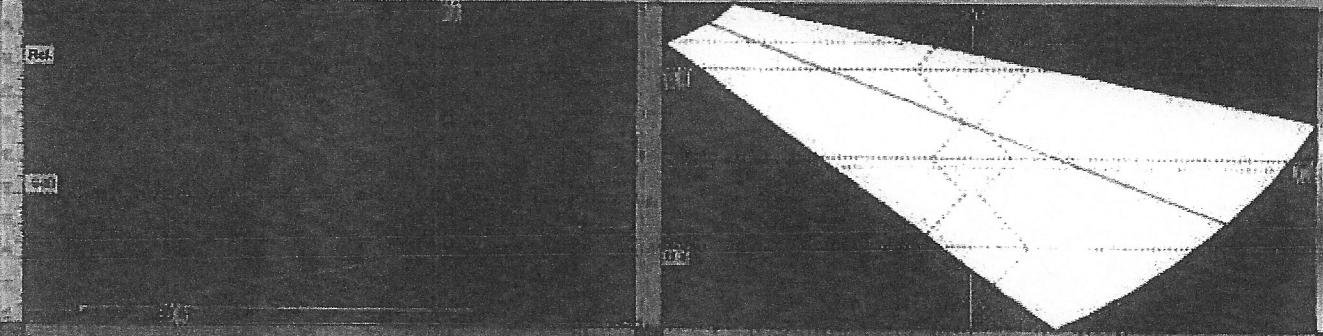
REFERENCE NUMBER 19101528-301

PHASED ARRAY EXAMINATION REPORT

Customer Name	Titan PEQ	Inspection Date	10/30/2019
Location	Lay Out	Purchase Order	N/A
Facility	Alleyton, Tx	Work Order	N/A
Project Name	4080 36664	Job Number	N/A

Weld Scan

LS



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Sulphur, LA 70665



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REFERENCE NUMBER
19110451-301

PHASED ARRAY EXAMINATION REPORT

Customer Name	Titan PEQ	Inspection Date	11/13/2019
Location	Lay Out	Purchase Order	N/A
Facility	Alleyton, Tx	Work Order	N/A
Project Name	4199 36700	Job Number	N/A

Work Description:	Perform PAUT on 100% of the long seam.	Work procedure	VIG-PAUT-01 Rev 1 / Appendic C
		Acceptance Criteria	ASME Sect VIII Div I
		Scan Plan ID	VIG-PAUT-SP-024

Examination Parameters						
Testing Instrument		Probe 1	Probe 2	Probe 3	Probe 4	
Manufacturer	Olympus	Make	Olympus	N/A	N/A	N/A
Model	MX2	Model	5L32-A31	N/A	N/A	N/A
S/N	Omni2-101793	Frequency	5MHz	N/A	N/A	N/A
Cal. Date	8/19/2019	Cable Type	Fixed	N/A	N/A	N/A
Module Model	Omni-MR 32:128	Cable Length	2.5m	N/A	N/A	N/A
Module S/N	QC-009550	S/N	R1510	N/A	N/A	N/A
Cal. Due Date	8/19/2020	Wedge Material	Rexolite	N/A	N/A	N/A
Software Version	MXU 4.4 R3	Wedge Model	SA31-NSS5	N/A	N/A	N/A
Encoder Information		Wedge Diameter	Flat	N/A	N/A	N/A
Calibration (steps/in)	400.35	Reference Db	35.7	N/A	N/A	N/A
Scan Resolution (in)	0.039"	Scanning Db	38.7	N/A	N/A	N/A
Scan Speed (in/sec)	6.00"/ Max	Sweep Angles	40-72	N/A	N/A	N/A
Last Cal. Date	10/1/2019	Cal In time	7:00AM	N/A	N/A	N/A
Calibration verified	Yes	Cal Out time	1:00PM	N/A	N/A	N/A
Time Verified	7:30AM	Calibration Blocks Used				

Scanners Used	Type	Material	Serial Number
ODI	Navshop	CS	53141
	Scanner Block	CS	TNE-VIG-084
Lamination Scan performed			
Transverse Scan performed			

Result Details		Scan Plans Used (if multiple)			
Total Welds Scanned	1				
Total Welds Accepted	1				
Total Welds Rejected	0				
Total Inches Scanned	117				

Technician (Print)	Brandon Suttle	Level I	Level III Review	Customer Approval
Technician (Signature)	<i>Brandon Suttle</i>	<input checked="" type="checkbox"/> I <input checked="" type="checkbox"/> II <input checked="" type="checkbox"/> III	(Print)	(Print)
Other Qualifications	<input checked="" type="checkbox"/> QUTE <input checked="" type="checkbox"/> QUPA <input type="checkbox"/> QUSE <input type="checkbox"/> PCN <input checked="" type="checkbox"/> Other: ASNT # 192157	(Sign)	(Sign)	
		Date:	Date:	

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Sulphur, LA 70665



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(337) 558-5114 Fax

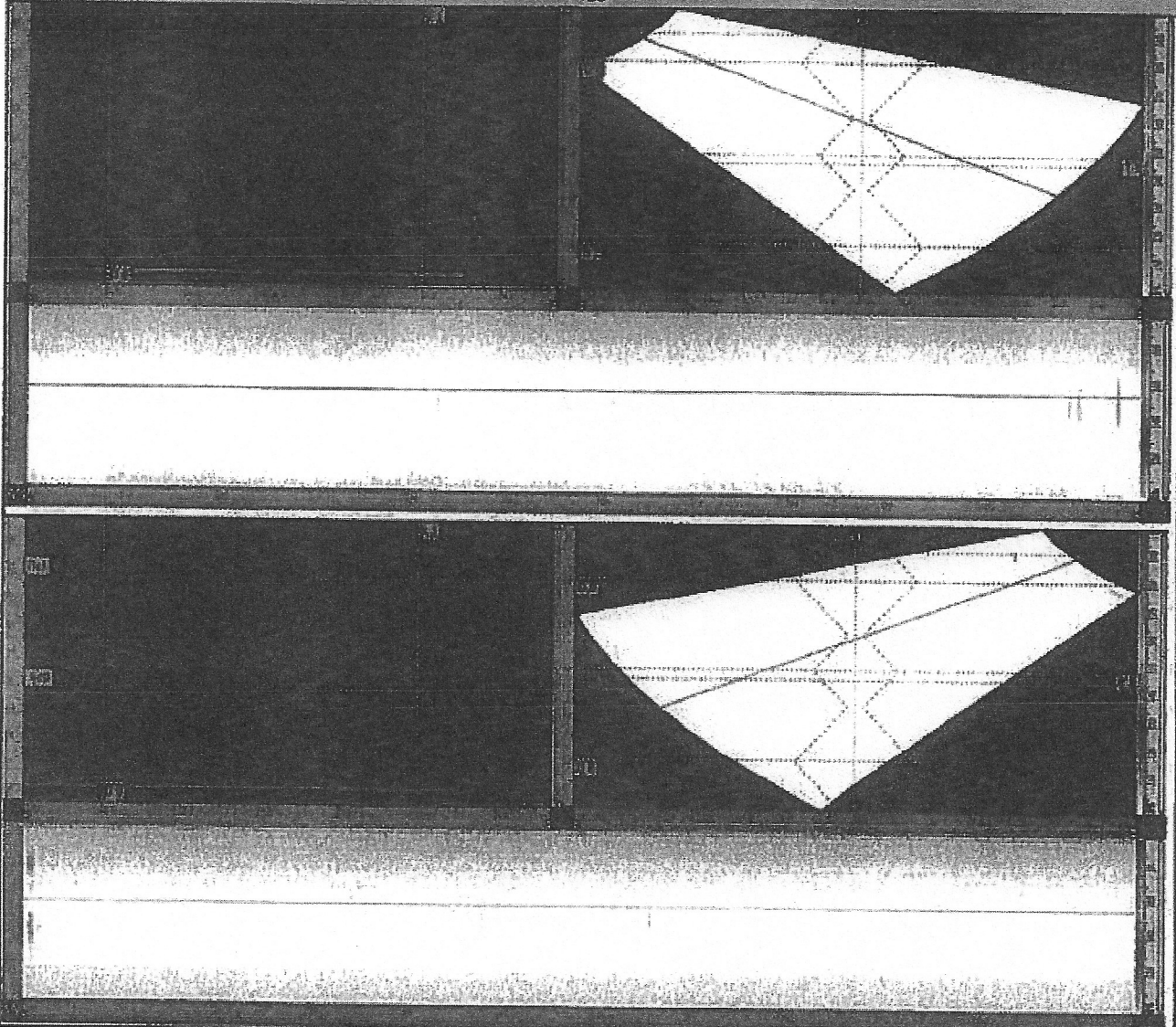
REFERENCE NUMBER
19110451-301

PHASED ARRAY EXAMINATION REPORT

Customer Name	Titan PEQ	Inspection Date	11/13/2019
Location	Lay Out	Purchase Order	N/A
Facility	Alleyton, Tx	Work Order	N/A
Project Name	4199 36700	Job Number	N/A

Weld Scan

LS



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4301 Hwy.27 South
 Sulphur, LA 70665



(337) 558-6071 Office
 (337) 558-5114 Fax

REFERENCE NUMBER 20010835-301

PHASED ARRAY EXAMINATION REPORT

Customer Name	Titan PEQ	Inspection Date	1/22/2020
Location	Bay 2	Purchase Order	N/A
Facility	Alleyton, Tx	Work Order	N/A
Project Name	4058 CLB19-742	Job Number	N/A
Work Description:	Perform PAUT on 100% of welds RS2-4.	Work procedure	VIG-PAUT-01 Rev 1 / Appencic C
		Acceptance Criteria	ASME Sect VIII Div I
		Scan Plan ID	VIG-PAUT-SP-0030
Examination Parameters			
Testing Instrument		Probe 1	Probe 2
Manufacturer	Olympus	Olympus	N/A
Model	MX2	SL32-A31	N/A
S/N	Omni2-101793	Frequency	5MHz
Cal. Date	8/19/2019	Cable Type	Fixed
Module Model	Omni-MR-32:128	Cable Length	2.5m
Module S/N	QC-009550	S/N	R1510
Cal. Due Date	8/19/2020	Wedge Material	Rexolite
Software Version	MXU 4.4 R3	Wedge Model	SA31-N55S
Encoder Information		Wedge Diameter	Flat
		Reference Db	39.7
Calibration (steps/in)	400.35	Scanning Db	42.7
Scan Resolution (in)	0.039"	Sweep Angles	40-72
Scan Speed (in/sec)	6.00"/ Max	Cal In time	7:00AM
Last Cal. Date	1/13/2020	Cal Out time	1:00PM
Calibration verified	Yes	Calibration Blocks Used	
Time Verified	7:30AM	Type	Material
Scanners Used		Navshop	Serial Number
ODI		Scanner Block	CS
			S3141
			TNE-VIG-084
Lamination Scan performed			
Transverse Scan performed			
<input type="checkbox"/> 45° <input type="checkbox"/> 60° <input type="checkbox"/> 70°			
Result Details		Scan Plans Used (if multiple)	
Total Welds Scanned	3		
Total Welds Accepted	3		
Total Weld Rejected	0		
Total Inches Scanned	492		
Technician (Print)	Brandon Suttle	Level	<input checked="" type="checkbox"/> I <input type="checkbox"/> II <input type="checkbox"/> III
Technician (Signature)	<i>Brandon Suttle</i>	Level III Review	<input type="checkbox"/> (Print)
Other Qualifications	<input checked="" type="checkbox"/> QUTE <input checked="" type="checkbox"/> QUPA <input type="checkbox"/> QUSE <input type="checkbox"/> PCN <input checked="" type="checkbox"/> Other: ASNT # 192157	Customer Approval	<input type="checkbox"/> (Print)
		Date:	<input type="checkbox"/> (Sign)
			<input type="checkbox"/> (Sign)

This report is not to be construed as a guaranty or warranty of the condition of the materials tested. Versa Integrity Group, Inc. is not liable for any misinterpretation of results or conditions, or for any claims or losses attributable to performance of a test. These services are rendered without any warranty. Any liability is limited to the amount paid for the services at issue. All orders are subject to Versa Integrity Group, Inc. Standard Terms and Conditions of Sale, which are available upon request. By signing above you agree with the interpretation of the test results and the manner in which it was performed.

4301 Hwy.27 South
Sulphur, LA 70665



(337) 558-6071 Office
(337) 558-5114 Fax

REFERENCE NUMBER

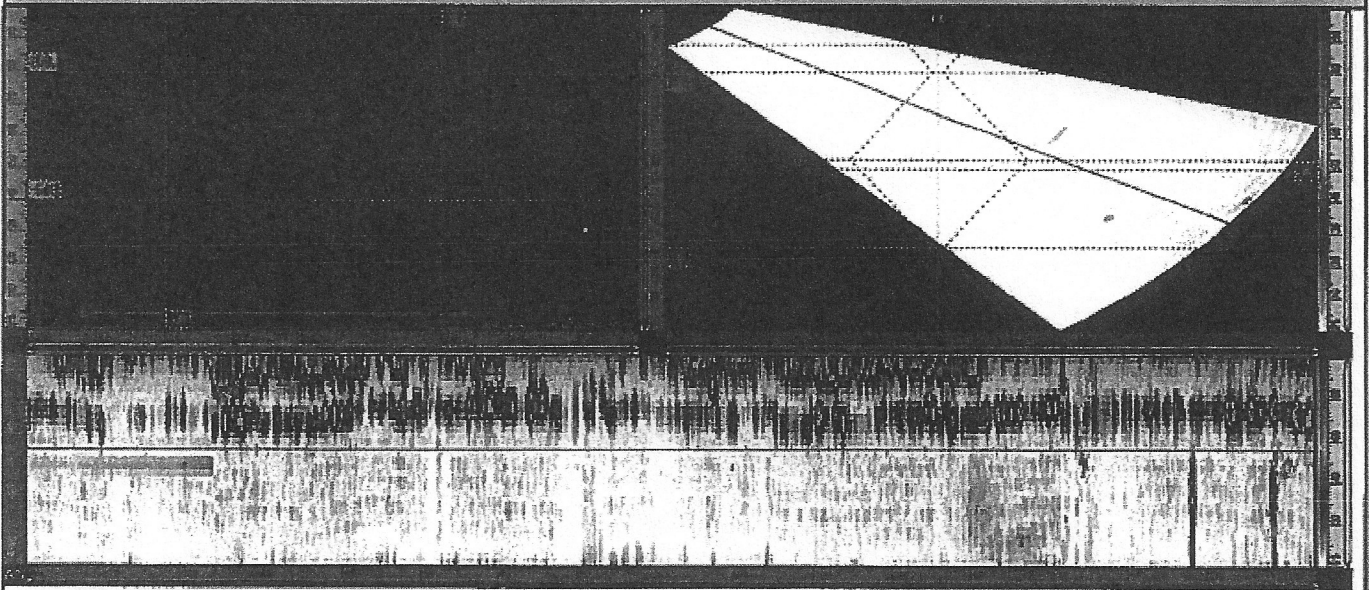
20010835-301

PHASED ARRAY EXAMINATION REPORT

Customer Name	Titan PEQ	Inspection Date	1/22/2020
Location	Bay 2	Purchase Order	N/A
Facility	Alleyton, Tx	Work Order	N/A
Project Name	4058 CLB19-742	Job Number	N/A

Weld Scan

RS2



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Sulphur, LA 70665



(337) 558-6071 Office
(337) 558-5114 Fax

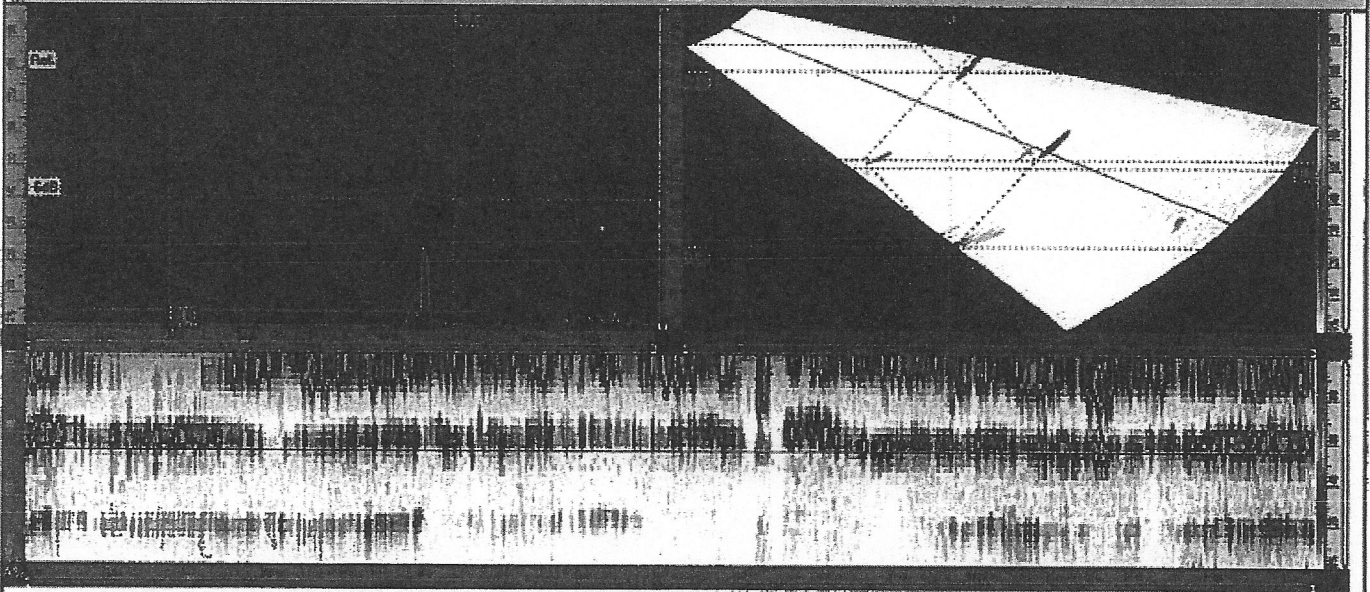
REFERENCE NUMBER 20010835-301

PHASED ARRAY EXAMINATION REPORT

Customer Name	Titan PEQ	Inspection Date	1/22/2020
Location	Bay 2	Purchase Order	N/A
Facility	Alleyton, Tx	Work Order	N/A
Project Name	4058 CLB19-742	Job Number	N/A

Weld Scan

RS3



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4301 Hwy.27 South
Sulphur, LA 70665



(337) 558-6071 Office
(337) 558-5114 Fax

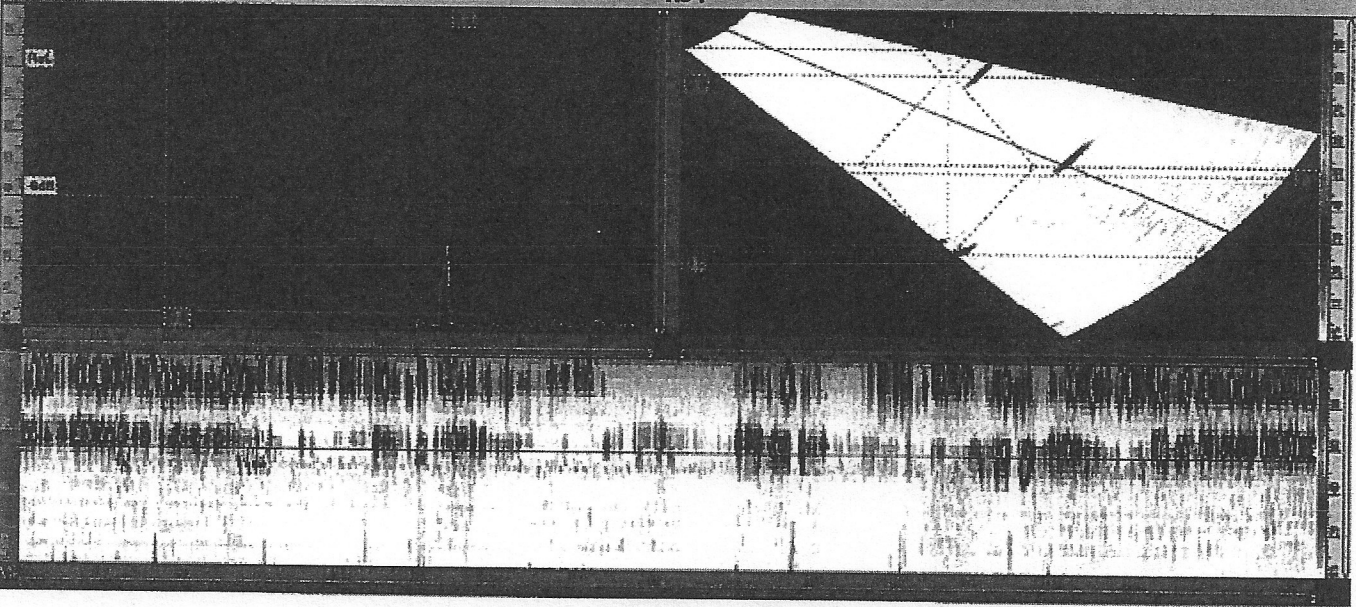
REFERENCE NUMBER
20010835-301

PHASED ARRAY EXAMINATION REPORT

Customer Name	Titan PEQ	Inspection Date	1/22/2020
Location	Bay 2	Purchase Order	N/A
Facility	Alleyton, Tx	Work Order	N/A
Project Name	4058 CLB19-742	Job Number	N/A

Weld Scan

RS4



This report is not to be construed as a guaranty or warranty of the condition of the materials tested. Versa Integrity Group, Inc. is not liable for any misinterpretation of results or conditions, or for any claims or losses attributable to performance of a test. These services are rendered without any warranty. Any liability is limited to the amount paid for the services at issue. All orders are subject to Versa Integrity Group, Inc. Standard Terms and Conditions of Sale, which are available upon request. By signing above you agree with the interpretation of the test results and the manner at which it was performed.



Magnetic Particle Test Report

VERSA INTEGRITY GROUP, INC.
4682 S. Sam Houston Pkwy East
Houston, Texas 77048

Client: Titan
Location: Houston, TX
Job or Project#: See Report
Surface Condition: Clean
Type of Examination: MT

Site: Columbus Page 4 of 5
Date: 3/26/2020
VIG Lab#: 20031074-302
NDT Procedure#: VIG-MT-01 Rev.2
Acceptance Std: ASME Sect. VIII Div.1
Material: C/S

Test Parameters

Magnetizing Source		Particles		Light Source (UV)		Light Source (White)	
Manu:	Contour Probe	Manu:	MAGNAVIS	UV Manu:	N/A	Meter Manu:	3E
Model	B100	Type:	7HF	Model:	N/A	Model #:	DLM1337
S/N	11637	Batch#:	4214	Intensity @ Surface:	N/A $\mu\text{W/cm}^2$	Meter SN:	170309572
Cal. Due	7/15/2020	Color:	WHITE	UV Light Meter Manu:	N/A	Foot-Candles:	100+
Type:	YOKE	10lb Block SN	F-349	Model:	N/A		
Input:	115 AC	50lb Block SN	N/A	S/N	N/A		
Amps:	6	Test Block Verification	YES	Cal Date:	N/A	Demag Required:	No
Temperature Gage SN:	N/A	Temperature Gage Manu:	N/A	Temp°:	Ambient		

TEST RESULTS

Flaw Code:	C-Crack	P-Porosity	NF-Non Fusion	LI-Linear Indication	S-Slag	LA-Lamination	Others-Specify
Part/ID No.	Part Size:	Thickness:	Accept	Reject	Flaw Code	Remarks	
Job # 004058	12" Noz	2"	✓			N1	
S/N # CLB-19-742	12" Noz	2"	✓			N2	
	2" Noz	2"	✓			N3 A	
	2" Noz	2"	✓			N3 B	
	2" Noz	2"	✓			N4	
	2" Noz	2"	✓			N5	
	1" Noz	2"	✓			N6	
	1" Noz	2"	✓			N7	
	1" Noz	2"	✓			N8	
	1" Noz	2"	✓			N9	
	1" Noz	2"	✓			N10	
	.75" Noz	2"	✓			N11	
	.75" Noz	2"	✓			N12 A	
	.75" Noz	2"	✓			N12 B	
	.75" Noz	2"	✓			N12 C	
	.75" Noz	2"	✓			N12 D	
	.5" Noz	2"	✓			N13	
	18" Noz	2"	✓			N14	
Accepted at time of inspection	2" Noz	2"	✓			N15 A	
	2" Noz	2"	✓			N15 B	

Technician/Level: Anthony Infante /LVL II Signature: [Signature] QC Verified:

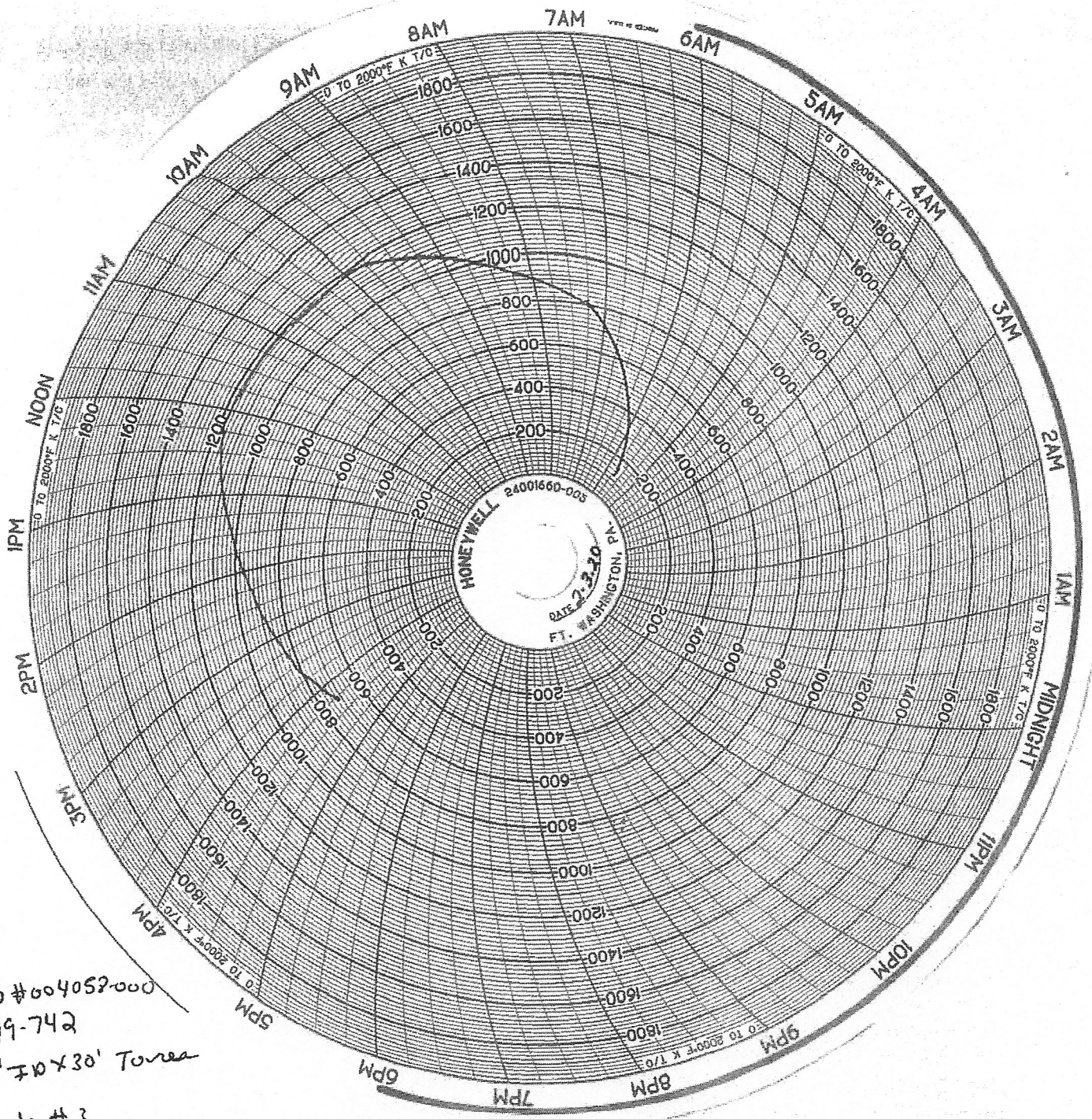
Phone: (832) 433-7942 Fax: (832) 433-7854 Toll Free (877) 703-3235 Versaintegrity.com

This report is not to be construed as a guaranty or warranty of the condition of the materials tested. Versa Integrity Group, Inc. is not liable for any misinterpretation of results or conditions, or for any claims or losses attributable to performance of a test. These services are rendered without any warranty. Any liability is limited to the amount paid for the services at issue. All orders are subject to Versa Integrity Group, Inc. Standard Terms and Conditions of Sale, which are available upon request. By signing above you agree with the interpretation of the test results and the manner at which it was performed. VIG MT

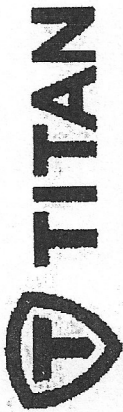


PWHT Procedure – Section VIII, Div. 1

Job No: 004058	SN: CLB19-742	Description: 48" ID X 30'-0" PACKED ABSORBER Thickness 2"
Materials: SA-36, SA-105n, SA-105, SA-350-LF2, SA-193-B7, SA-194-2H, SA-516-70N, SA-516-70		
Governing P No [UW-40(d) & UCS-56(c)]:		Governing thickness [UW-40(f)]:
Heat Treating Instructions: Maximum furnace loading temperature 800°F [UCS-56(d)(1)] Heating rate above 800°F: <u>200</u> °F per hour (400°F /max. thickness of shell or head in inches). Not to exceed 400 °F per hour. [UCS-56-(d)(2)] Hold at or above <u>1100</u> °F for <u>2</u> hours and <u>10</u> minutes. [UCS-56 (d) (3)(4) Table UCS-56. _____] Cooling rate to 800 °F: <u>250</u> °F per hour (500 °F/max. thickness of shell or head in inches). Not to exceed 500 °F per hour. [UCS-56(d)(5)] Cooling below 800 °F shall be in still air. Special Instructions: <u>FUTHER COOLING IN STILL AIR HEAT TRETMENT TO BE PERFORMED IN ACCORDANCE WITH ASME CODE SECTION VIII PRAGRAPH UCS-56</u>		
The operation of postweld heat treatment shall be performed in accordance with the following procedure: [UCS-56 (d)] <ul style="list-style-type: none">• Enclosed furnace- UW-40(a)(1)		
Thermocouples: <ul style="list-style-type: none">• Attachment by capacitor discharge welding will be performed to a WPS in accordance with UW-37(h)(1) and shall be limited to 125 W-sec (UW-37(h)(2).• Placement will be such that the minimum temperature (thickest part) will be measured (UW-40(c)• The maximum spacing shall be 15 foot (UCS-56(d)(2)- 7 ½' recommended		
QC release for PWHT: <ul style="list-style-type: none">• Welding is complete. [UW-40(e)]• Item is properly marked QC release <i>Brent Eckert</i> Date: <u>2/4/2020</u>		
QC acceptance post PWHT: <ul style="list-style-type: none">• Identification maintained• Inspection of pressure retaining item for damage.• Time/temperature chart complete and acceptable (UW-49)• Calibration of heat-treating equipment available QC acceptance: <i>Brent Eckert</i> Date: <u>2/4/2020</u>		



Wrip #004052-000
 Clb 19-742
 42" x 30' Tower
 records # 3
 S/N 8848



Piping: X
 Vessels:

Customer: INFLECTION ENERGY

Customer P.O. No.: _____

The pressure gauge on the item being tested, rules, and record, when used, are for pictorial representation only.

Date	Job #	Skid/Unit	Vessel S/N	Spool No./Skid No.	Re-test	Chart Recorder Number	Test Pressure	Medium	Gauge Number	Test Tech.	QC Inspector	Customer Inspector	Trans. Pressure Range
3-10-2020	004058-000	VESSEL	CLB19-742	NA		5009 5009	2160 30 MIN	WATER	5000-10		SC		

Titan certifies that the above test information is correct and accurate and the report is to verify that the components listed above have satisfactorily passed a

Hydrostatic Test Pneumatic Test Other: _____

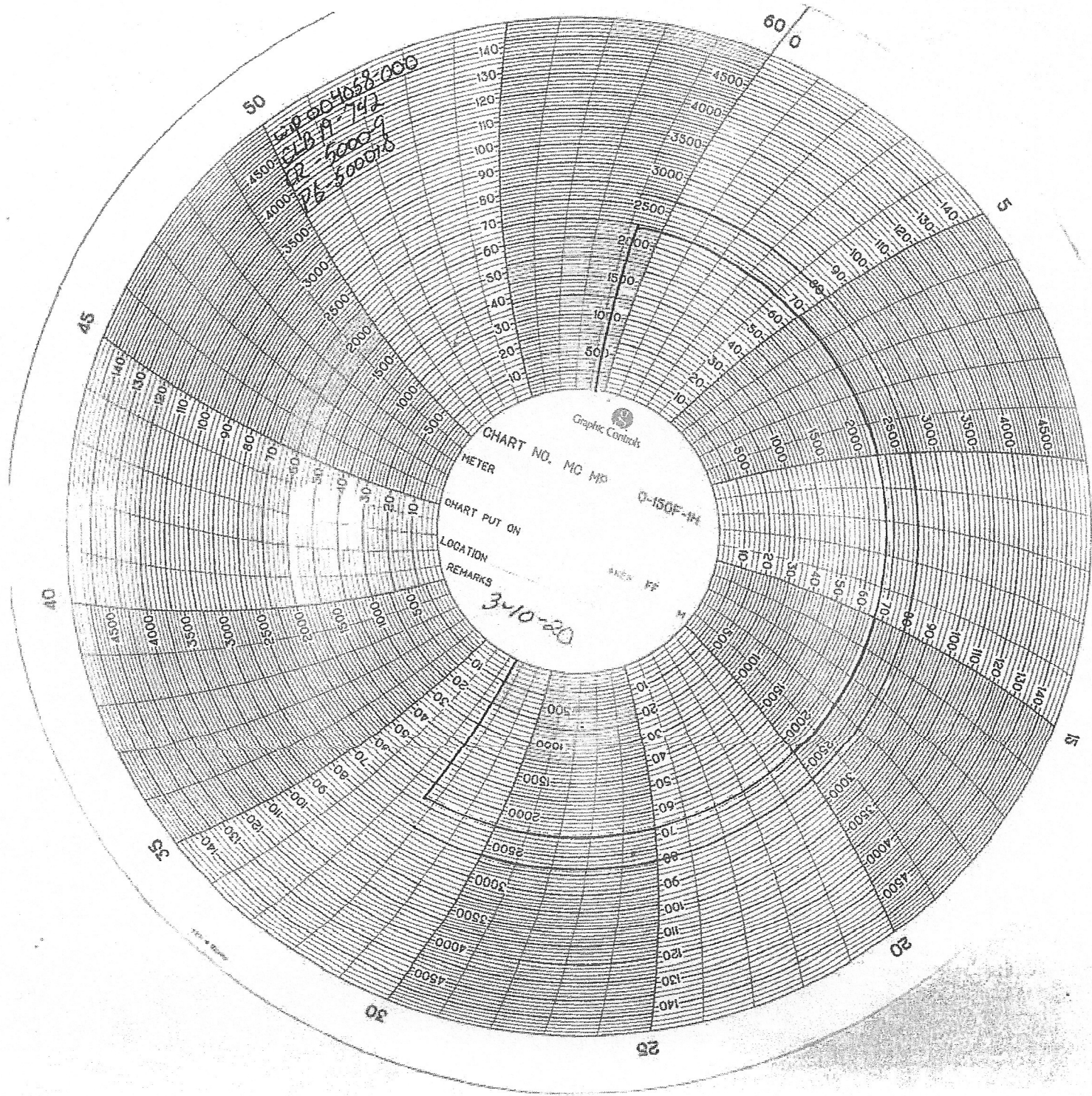
and complies with all, required codes, specifications, and procedures

[Signature] Titan QC Representative 3-10-2020 Date

[Signature] Customer Witness Representative 3/10/20
 Authorized Inspector

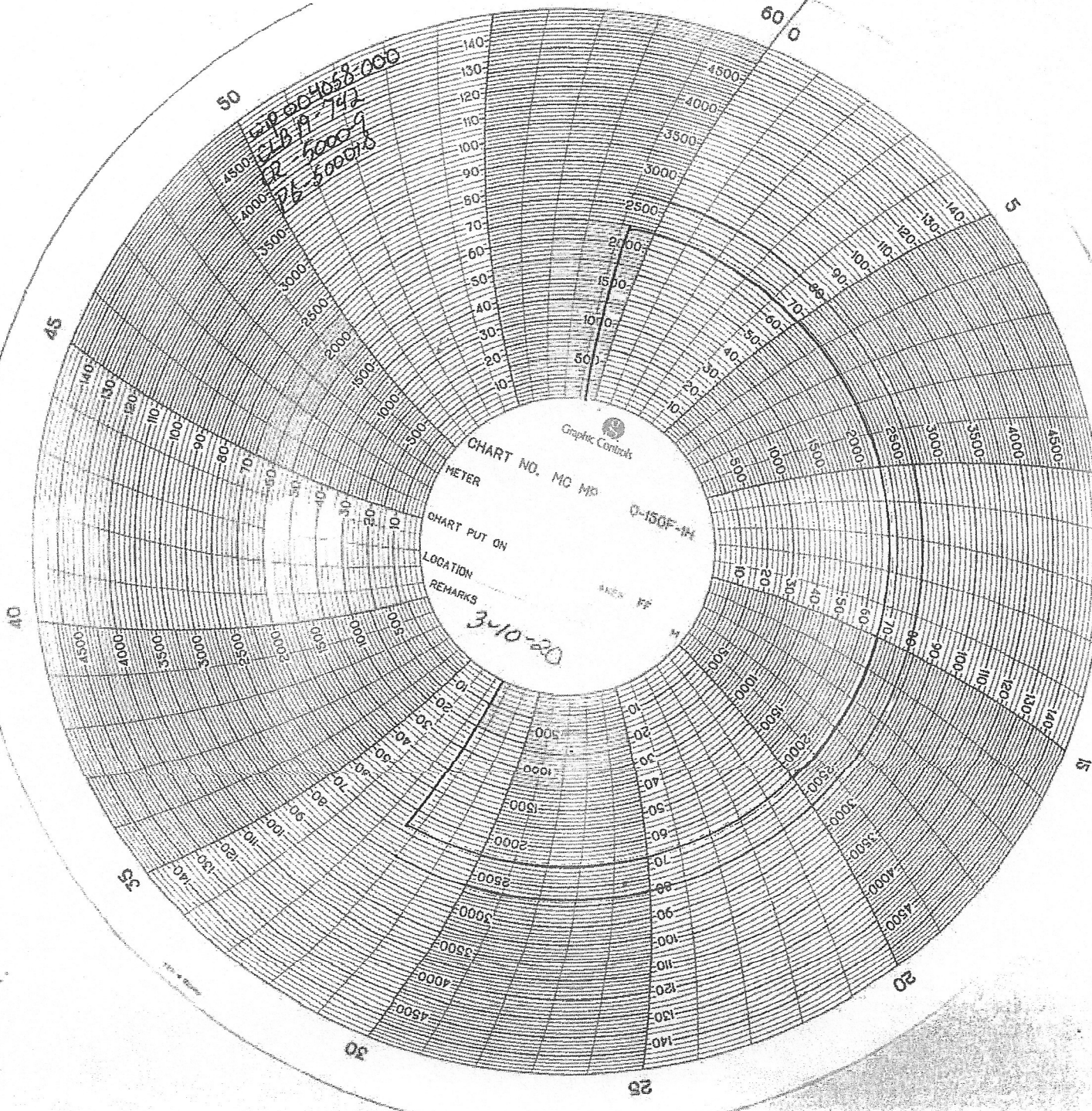
Other Signature _____

Notes: _____



Handwritten notes in the upper left quadrant:
100-604058-000
CLB-A-742
ER-50009
76-500078

Graphic Controls
CHART NO. MC MK 0-150F-IN
METER
CHART PUT ON
LOCATION
REMARKS
3410-20



CERTIFIED CALIBRATION REPORT

INDUSTRIAL INSTRUMENT COMPANY

3807 PINEMONT DR. HOUSTON TEXAS 77018 PHONE (713) 861-9556

PRESSURE GAUGES / PRESSURE-TEMP.RECORDERS / DEADWEIGHTS TESTERS /
CHART DRIVES / RENTALS

CUSTOMER TITAN PRODUCTION EQUIPMENT

DATE TESTED 1-23-20

INVOICE NO. 3699

CERTIFIED PRESSURE / TEMPERATURE RECORDER CALIBRATION CERTIFICATE

CUSTOMER ORDER NO. 0007637-0

SERIAL NO. CR-5000-9

INSTRUMENT TYPE: BARTON 2 PEN CHART RECORDER 5000# / 0-150F

	READING NUMBERS	APPLIED PRESSURE	ACTUAL READING	DIFFERENCE
1.	5000#	1000	1000	+/-0
2.		2000	2000	+/-0
3.		3000	3000	+/-0
4.		4000	4000	+/-0
5.		5000	5000	+/-0
6.				
7.				
8.				
9.				
10.				

ROOM TEMP AT TEST 74-DEGREES-F.

THE ABOVE INSTRUMENT HAS BEEN CALIBRATED TO A STANDARD TRACEABLE TO N.I.S.T.
AND THE READINGS ARE CORRECT WITHIN (+/-1%) OF THE INDICATED READINGS.

SUPERVISOR OF INSPECTION
KEVIN BATTARBEE



DATE TESTED 01-23-20

DATE DUE 01-23-21

The standards used in this certification have measurement traceability to the National Institute of Standards and Technology (NIST).
The calibrations were performed to customer requirements using standards that have been calibrated at an ISO 9002:2015 accredited laboratory.

STANDARDS UTILIZED

Manufacturer	Model	Serial Number	Report Number	Due Date	Reference Uncertainty
Crystal Engineering	10KPSIXP2I	261028	31630:25727	28-Oct.-2020	0-20% of FS: +/- (.02% of FS); 20%-100% of FS: (+/-).1% of Rdg.
McDaniel	30,000 PSI	12387A	28042:24656	07-July-2020	0.5% of Span

INDUSTRIAL INSTRUMENT COMPANY OF HOUSTON
3807 PINEMONT DR. HOUSTON, TX. 77018 (713)861-9556

**CERTIFIED CALIBRATION REPORT
(TEMPERATURE) DEGREES F.**

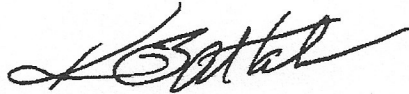
INDUSTRIAL INSTRUMENT COMPANY HEREBY CERTIFIES THAT THE EQUIPMENT ITEMIZED BELOW HAS BEEN CALIBRATED TO MEET MANUFACTURER'S STANDARDS.

COMPANY NAME: TITAN PRODCUTION EQUIPMENT

MANUFACTURER: BARTON RECORDER SERIAL NO. CR-5000-9

DESCRIPTION: 0-150-TEMP.F

CALIBRATED BY: KEVIN BATTARBEE



CALIBRATION DATE: 01-23-20

DATE DUE: 01-23-21

TEMPERATURE DEG.F	TEST READING	INSTRUMENT READING	FINAL
0-150-F	40	40	40
	100	100	100
	140	140	140

STANDARDS UTILIZED:

Manufacturer	Model	Serial Number	Report Number	Due Date	Reference Uncertainty
Tegam, Inc.	819A	T-281778	30365:25333	11-04-2020	+/-0.18F Deg.
Vaisala	HMP75	M0550086	H33-16050184	07-09-2020	+/-0.18F Deg.

TEMPERATURE 74-DEGREES AT TEST

THE STANDARDS USED IN THIS CALIBRATION ARE TRACEABLE TO THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (NIST).
THE CALIBRATIONS PERFORMED TO CUSTOMER REQUIREMENTS USING STANDARDS THAT HAVE BEEN CALIBRATED AT AN ISO/IEC 17025 ACCREDITED LABORATORY.

Certificate of Calibration

Report number FASTCAL-C00372
 INDUSTRIAL INSTRUMENT CO. OF HOUSTON 3807 PINEMONT DR 77018

Manufacturer	Model	Gauge Number	Serial Number	Calibration Date	Expiration Date
ASHCROFT	ASHCROFT 5000	PG-5000-10	PG-5000-10	6/3/2019	6/3/2020

Model Uncertainty
+/- ASME 1A of span (1%)

All instrument calibrations are verified for accuracy before they are shipped. The recommended calibration interval for this instrument is 12 months from the date of verification. Your particular quality assurance requirements may supersede this recommendation.

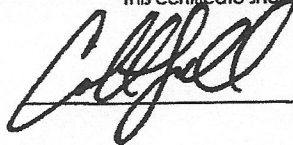
As Received Condition: Out of tolerance **As Left Condition:** In tolerance

Laboratory ambient conditions throughout this calibration were: Temperature 74F

Reference Standards used in this calibration are traceable to the National Institute of Standards and Technology of the United States, through the following report numbers:

Manufacturer	Model	Serial Number	Report Number	Due Date	Reference Uncertainty
Crystal Engineering	10KPSIXP21	261028	261028	12-Nov-19	0-20% of FS: ±(0.02% of FS); 20%-100% of FS: ±(0.1% of Rdg)

This certificate shall not be reproduced except in full, without written approval.



Laboratory Representative



Quality Representative

Test Results

Report number FASTCAL-C00372

PG-5000-10

As Received Test Results

5000 PSI

Reference Reading	Gauge Reading	Allowable Tolerance	Difference	Difference (% of FS)	Condition
-1	0	50	1	0.02%	Pass
947	1000	50	53	1.06%	Fail
1937	2000	50	63	1.26%	Fail
2957	3000	50	43	0.86%	Pass
3935	4000	50	65	1.30%	Fail
4941	5000	50	59	1.18%	Fail
3935	4000	50	65	1.30%	Fail
2925	3000	50	75	1.50%	Fail
1902	2000	50	98	1.96%	Fail
926	1000	50	74	1.48%	Fail
-1	0	50	1	0.02%	Pass

As Left Test Results

5000 PSI

Reference Reading	Gauge Reading	Allowable Tolerance	Difference	Difference (% of FS)	Condition
-1	0	50	1	0.02%	Pass
1001	1000	50	-1	-0.02%	Pass
2000	2000	50	0	0.00%	Pass
2999	3000	50	1	0.02%	Pass
3999	4000	50	1	0.02%	Pass
5001	5000	50	-1	-0.02%	Pass
3996	4000	50	4	0.08%	Pass
3000	3000	50	0	0.00%	Pass
2001	2000	50	-1	-0.02%	Pass
1003	1000	50	-3	-0.06%	Pass
-1	0	50	1	0.02%	Pass

AR Head correction:
AL Head correction:

0 PSI
0 PSI

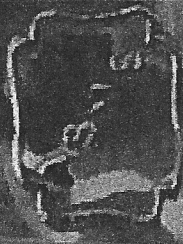
CERTIFIED



MAWP

MAWP

MDMT



W

HT
HT

S/N:

CLB19-74

YEAR

2020

DWG NO T-100108-101

FOR S...

ULIAN

CODE

CLB

1440

FSI @

130

9F

FSI @

9F

220

9F @

1440

PSI

EST. WT. 51,000 LBS

TRIP NO 004058-000

170

NO MORE PACKED

BEER

1/6" GA

8668

CLB

130

11

1440

TITAN

PSI @

PSI @

PSI @

1440

-20

OF

OF

PSI

19-742




TITAN

STANDARD RELEASE FOR SHIPMENT FORM

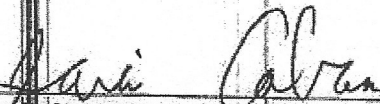
Vendor Name	BARTEN CONTROLS	Date	3/23/20
Job Number	4058	Due Date	3/23/20
Purchase Order Number	8685	Quantity <small>(If multiple, note # of total #)</small>	1
Customer Name <small>(if available)</small>	INFLECTION	Serial Number(s) <small>(if regen unit - list all associated serial numbers in the comments section)</small>	
Equipment Description	48" x 30' ABS/SCA		
Comments			

- Release for Shipment *(Please note in comments ship to location, including direct ship).*
- Rejected *(note reason for rejection in the comments)*


Vendor Release Signature

Title

3/23/20
Date


Titan Release Signature

Title

3-24-2020
Date

Barten Industrial Coatings QA/QC Program

Facility/Project: TITAN Job# CLB19-742
 Area/Item: 48' X 30' ABS / SCR POWER W/ HEAT EXCHANGER
 Date: 5/19/20 Day: MON/TUE/WED/THUR ~~SAT/SUN~~
 Existing Coating Thickness: MIN DFT 2.9 MAX DFT 9.6 AVG DFT 6.0
 Existing Substrate Condition: NEW FREE MILL SCALE

ATMOSPHERIC CONDITION

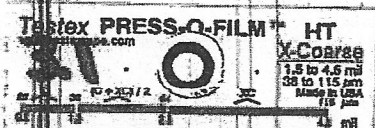
Note: All atmospheric measurements taken at time of application.

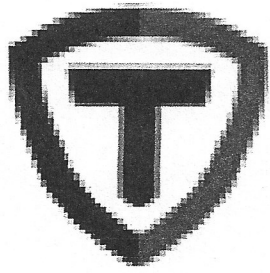
TIME:	_____ am	_____ am	<u>2</u> pm	_____ pm
DRY BULB:	_____ F	_____ F	<u>78.2</u> F	_____ F
WET BULB:	_____ F	_____ F	_____ F	_____ F
HUMIDITY:	_____ %	_____ %	<u>71.0</u> %	_____ %
SURFACE TEMP	_____ F	_____ F	<u>79.3</u> F	_____ F
DEW POINT	_____ F	_____ F	<u>68.3</u> F	_____ F

MATERIALS USED

Product	Color	Batch# Part A	Batch# Part B
Coat 1 <u>Chromalox 8232</u>	<u>Grey</u>	<u>192070203</u>	<u>192007213</u>
Thinner	<u>2151</u>	_____	_____
Coat 2	_____	_____	_____
Thinner	_____	_____	_____
Coat 3	_____	_____	_____
Thinner	_____	_____	_____

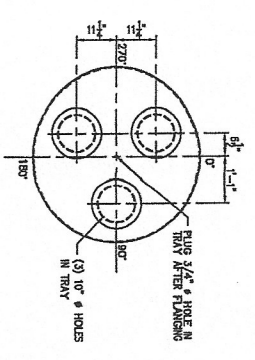
Best Profile Readings:



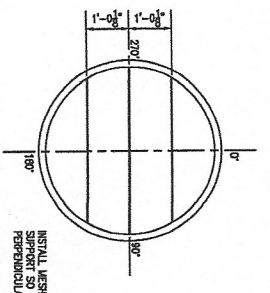


TITAN

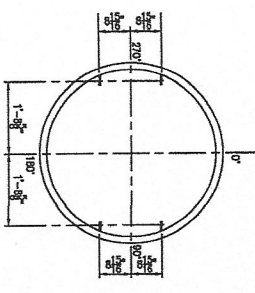
Section II



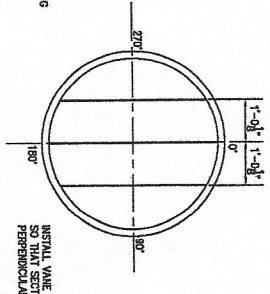
HAT TRAY DETAIL
(ONE TRAY W/3 STANDPIPES REQUIRED)



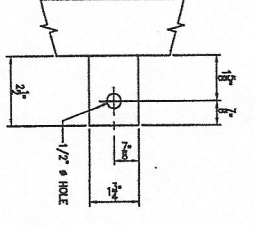
MIST EXTRACTOR / PACKING SUPPORT DETAIL
(INSTALL MESH EXTRACTORS & PACKING SUPPORT SO THAT SECTIONS ARE PERPENDICULAR TO SUPPORTS)



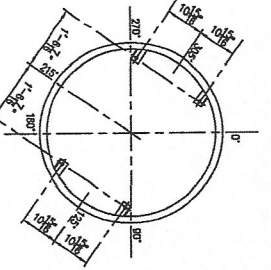
PACKING HOLD-DOWN CLIP PLAN



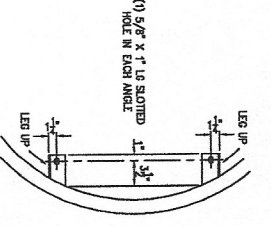
VANE HOLD DOWN DETAIL
(INSTALL VANE SO THAT SECTIONS ARE PERPENDICULAR TO SUPPORTS)



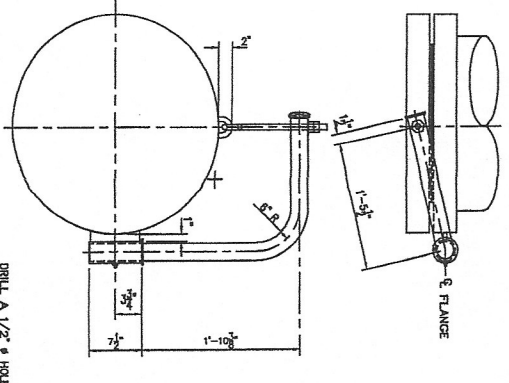
DETAIL ITEM #51



DISTRIBUTOR SUPPORT CLIP PLAN

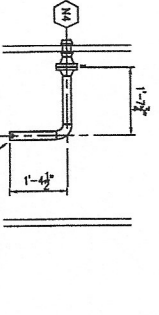


DISTRIBUTOR SUPPORT CLIP DETAIL
(1) 5/8\"/>

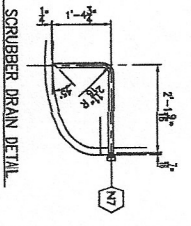


DAVIT DETAIL

DRILL A 1/2\"/>



GLYCOL INLET PIPE DISTRIBUTOR DETAIL



SCRUBBER DRAIN DETAIL

TOLERANCES:
CUTS ± 1/8"
ANGLES ± 1/2° BEARING
DIMENSIONS ± 0.005
DECIMAL DIM. ± .002
BEND DIM. ± 1/8"

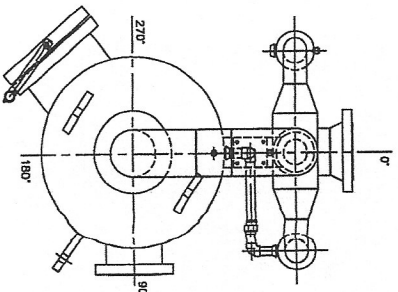
THIS DRAWING IS THE PROPERTY OF TITAN, LLC. IT IS TO BE USED FOR CONSTRUCTION ONLY. IT IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF TITAN, LLC.



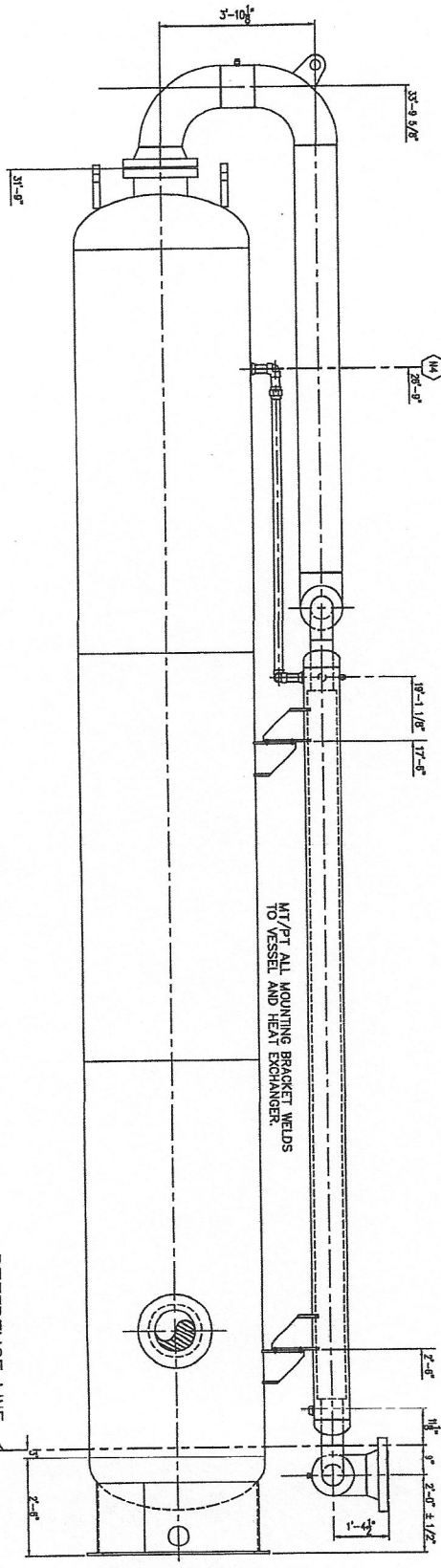
DATE	BY	CHK	REV	DATE	BY	CHK	REV
02/24/2018	VB		1	02/24/18	BN		1
TITAN PRODUCTION EQUIPMENT STOCK 2227 FM 290 AUSTIN, TEXAS 78755 TITLE: 48" ID X 30'-0" S/S Ø 1440" PACKED ABSORBER/SCRUBBER W/HEAT EXCHANGER DRAWN BY: JONAS CHECKED BY: JONAS SCALE: 1/4" = 1'-0" DRAWING NO: T-1001054-102 SHEET NO: 2 of 3							

SURFACE PREPARATION & COATING SYSTEM									
ITEM	SURFACE PREPARATION	REF. RATE (MIN-MAX)	COAT NO. 1	PAINT TYPE	REF. RATE (MIN-MAX)	COAT NO. 2	PAINT TYPE	REF. RATE (MIN-MAX)	THICKNESS (MIN-MAX)
Attachment/Accessories	SSP-SP4 W/1.5-SALT BLAST PROFILE	3.0-5.0	COLOUR	NONE	NONE	COLOUR	NONE	NONE	3.0-5.0
TOTAL		3.0-5.0	COLOUR	NONE	NONE	COLOUR	NONE	NONE	3.0-5.0

NOTES:
 1. BIDDY OF SHOP PRICES AND COSTS SHALL BE BASED ON THE ABOVE SPECIFICATIONS.
 2. BIDDY OF SHOP PRICES AND COSTS SHALL BE BASED ON THE ABOVE SPECIFICATIONS.
 3. BIDDY OF SHOP PRICES AND COSTS SHALL BE BASED ON THE ABOVE SPECIFICATIONS.
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 10. BIDDY OF SHOP PRICES AND COSTS SHALL BE BASED ON THE ABOVE SPECIFICATIONS.
 11. BIDDY OF SHOP PRICES AND COSTS SHALL BE BASED ON THE ABOVE SPECIFICATIONS.



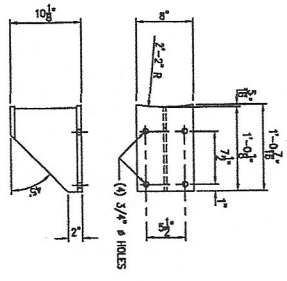
PLAN



ELEVATION

MT/PT ALL MOUNTING BRACKET WELDS TO VESSEL AND HEAT EXCHANGER.

REFERENCE LINE
 ALL VERTICAL DIMENSIONS ARE FROM THIS LINE



DETAIL ITEM 76

1/2" SOCKETWELD INSERTIONS



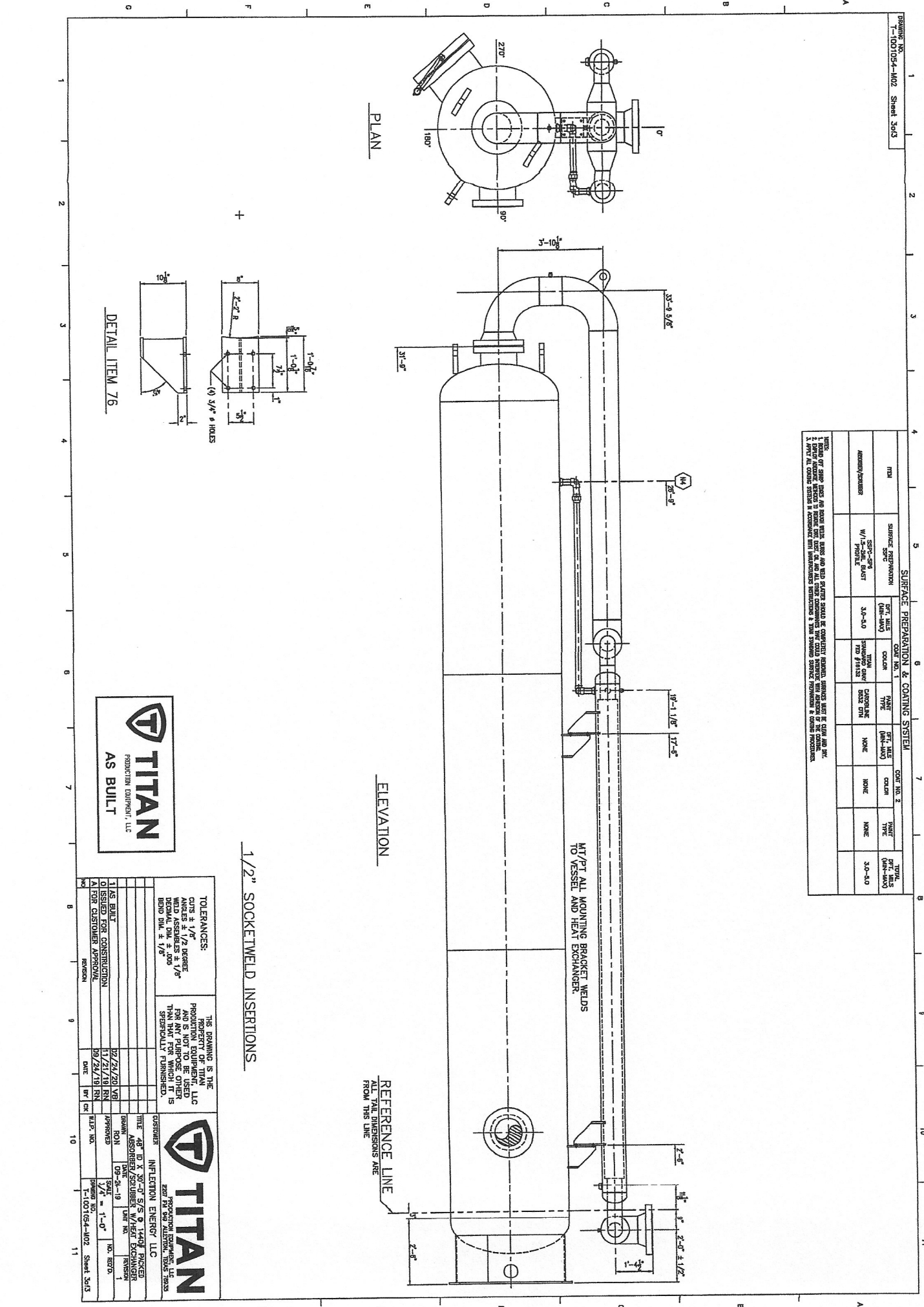
TOLERANCES:
 CUTS ± 1/8"
 ANGLES ± 1/2 DEGREE
 WELD ASSEMBLIES ± 1/8"
 DECIMAL DIM. ± .005
 BEND DIM. ± 1/8"

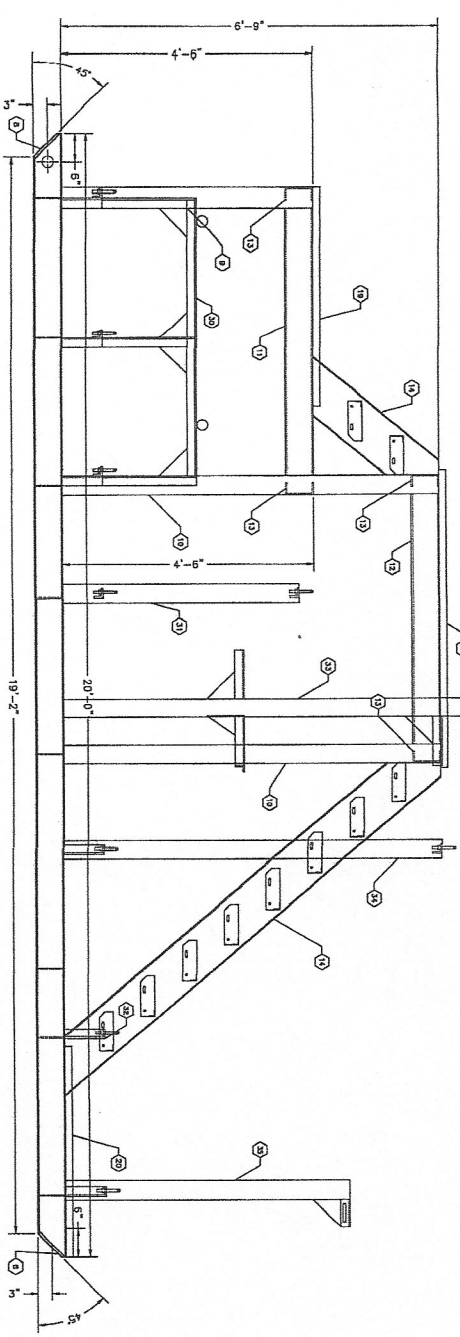
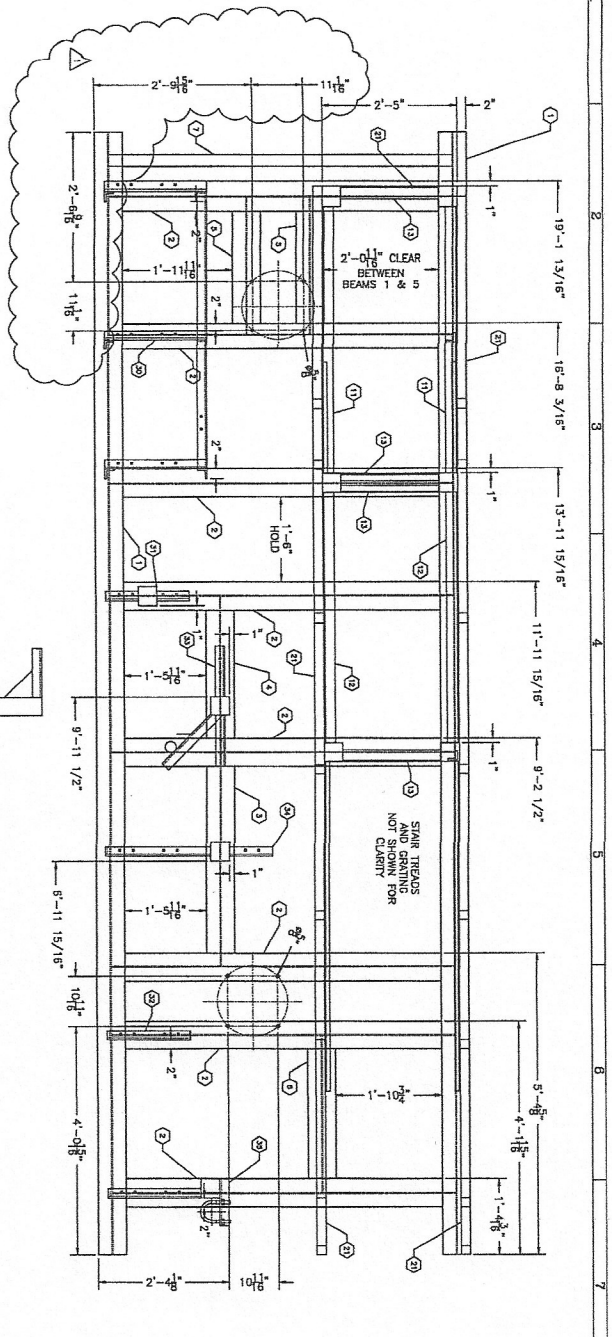
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NO.	DESCRIPTION	DATE	BY	CHK
1	AS BUILT	02/24/20	VB	
2	ISSUED FOR CONSTRUCTION	11/21/19	RM	
3	FOR CUSTOMER APPROVAL	09/24/19	RM	

CUSTOMER: INFLICTION ENERGY LLC
 PROJECT: 48" ID X 30'-0" S/S W/144" EXCHANGER
 DRAWN: RON
 DATE: 02-24-19
 UNIT NO.: 101-8870
 REVISION: 1
 1/2" ± 1-0"





CONSTRUCTION	
USE SYMBOLS TO INDICATE TYPE	<input type="checkbox"/> FOR JOIST
<input type="checkbox"/> ROOF / FLOOR	<input type="checkbox"/> ROOF / FLOOR
<input type="checkbox"/> ROOFING / FINISH	<input type="checkbox"/> ROOFING / FINISH
<input type="checkbox"/> OTHER	<input type="checkbox"/> OTHER
<input type="checkbox"/> AS BUILT	<input type="checkbox"/> AS BUILT
<input type="checkbox"/> RECONSTRUCTED	<input type="checkbox"/> RECONSTRUCTED

NO.	QTY	DESCRIPTION	REFERENCE
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2	1	WOODS, 2x4 Lamin. CS	15-333-MONT-301
3	1	WOODS, 2x4 Lamin. CS	15-333-MONT-301
4	1	WOODS, 2x4 Lamin. CS	15-333-MONT-301
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11	1	WOODS, 2x4 Lamin. CS	15-333-MONT-301
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34	1	WOODS, 2x4 Lamin. CS	15-333-MONT-301
35	1	WOODS, 2x4 Lamin. CS	15-333-MONT-301

BILL OF MATERIAL			
NO.	QTY	DESCRIPTION	REFERENCE
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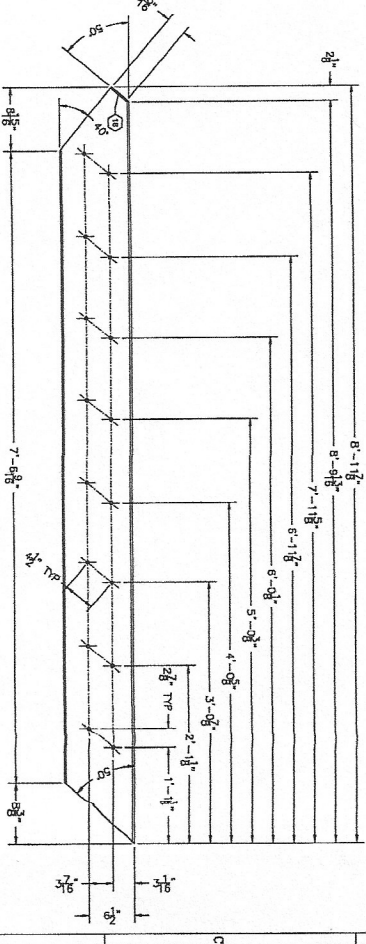
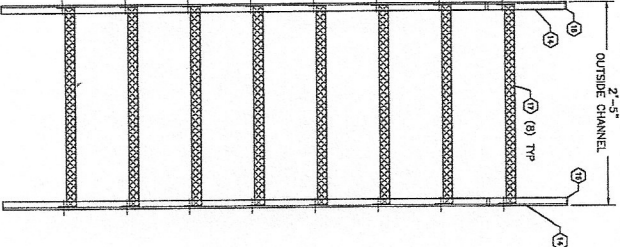
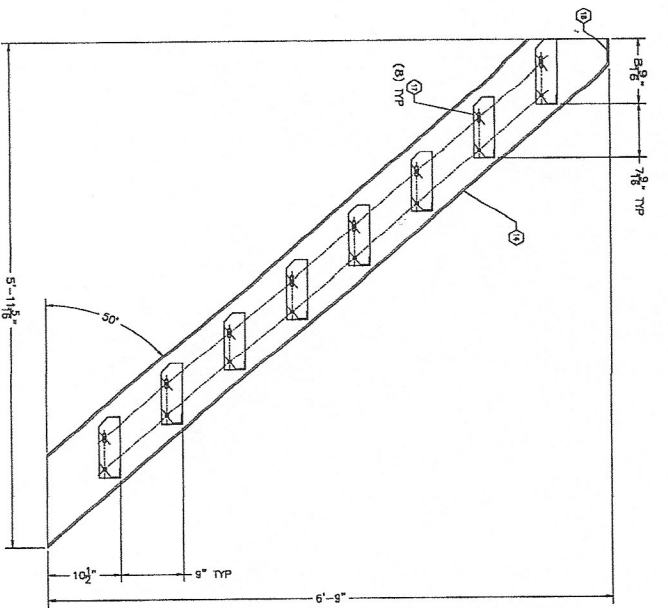
VAVCO LLC.

FOR MAJOR EXHAUST THROUGH THE ROOF

TYPICAL PLAN AND ELEVATION VIEWS

DATE	1/17/2013	BY	MM
SCALE	1/4" = 1'-0"	SCALE	1/4" = 1'-0"
PROJECT NO.	1300	PROJECT NO.	1300
REV.	1	REV.	1

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100	2



STAIR STRINGER
UPPER PLATFORM
DTY: 2

CONSTRUCTION

THIS DRAWING IS RELEASED FOR:

- FOR THE ARCHITECT
- FOR THE ENGINEER
- FOR THE CONTRACTOR
- FOR THE MANUFACTURER
- FOR THE INSTALLER
- FOR THE MAINTENANCE PERSONNEL
- FOR THE USER

DATE: 8/1/2013

RELEASED FOR CONSTRUCTION:

NO.	DESCRIPTION	DATE	BY
1	ISSUED FOR CONSTRUCTION	8/1/2013	...

VAVCOLL.C.

THE HANOVER GROUP, INC.

FIRE PROTECTION ENGINEER

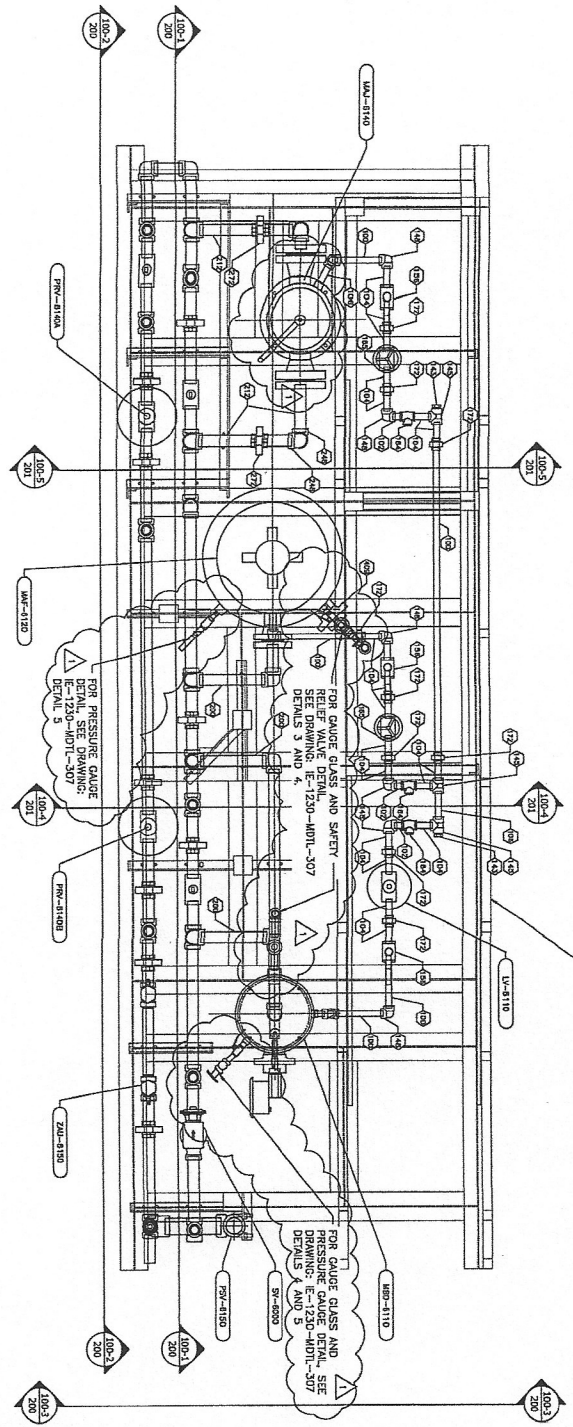
1111 HANOVER STREET, SUITE 200

HANOVER, MA 01927

TEL: 603-271-1111

WWW.VAVCOLL.C.COM

FUEL GAS SKID
PLAN VIEW



- GENERAL NOTES AND COMMENTS:**
1. GENERAL NOTES, COMMENTS, DIMENSIONS, AND MATERIALS TO BE INDICATED AS NOTED. VISUAL INSPECTION SHALL SHOW NO LACKS, OCCURRENCE OF SUCCESSFUL.
 2. DIMENSIONS SHALL BE PROVIDED AS SHOWN UNLESS OTHERWISE NOTED.
 3. ONE (1) OF EACH ASSSEMBLY SHOWN UNLESS OTHERWISE NOTED.
 4. ALL PIPE MATERIAL AND FINISHES SHALL BE AS SHOWN UNLESS OTHERWISE NOTED.
 5. ALL PIPE MATERIAL AND FINISHES SHALL BE AS SHOWN UNLESS OTHERWISE NOTED.

CONSTRUCTION	
FOR SKID	C FOR AS
FOR VALVE	C FOR AS
FOR GAUGE	C FOR AS
FOR RELIEF VALVE	C FOR AS
FOR PRESSURE GAUGE	C FOR AS
FOR SAFETY RELIEF VALVE	C FOR AS
FOR OTHER	C FOR AS
FOR PIPE	C FOR AS
FOR FITTINGS	C FOR AS
FOR WELDS	C FOR AS
FOR PAINT	C FOR AS
FOR GRATING	C FOR AS
FOR SKID	C FOR AS
FOR VALVE	C FOR AS
FOR GAUGE	C FOR AS
FOR RELIEF VALVE	C FOR AS
FOR PRESSURE GAUGE	C FOR AS
FOR SAFETY RELIEF VALVE	C FOR AS
FOR OTHER	C FOR AS
FOR PIPE	C FOR AS
FOR FITTINGS	C FOR AS
FOR WELDS	C FOR AS
FOR PAINT	C FOR AS
FOR GRATING	C FOR AS

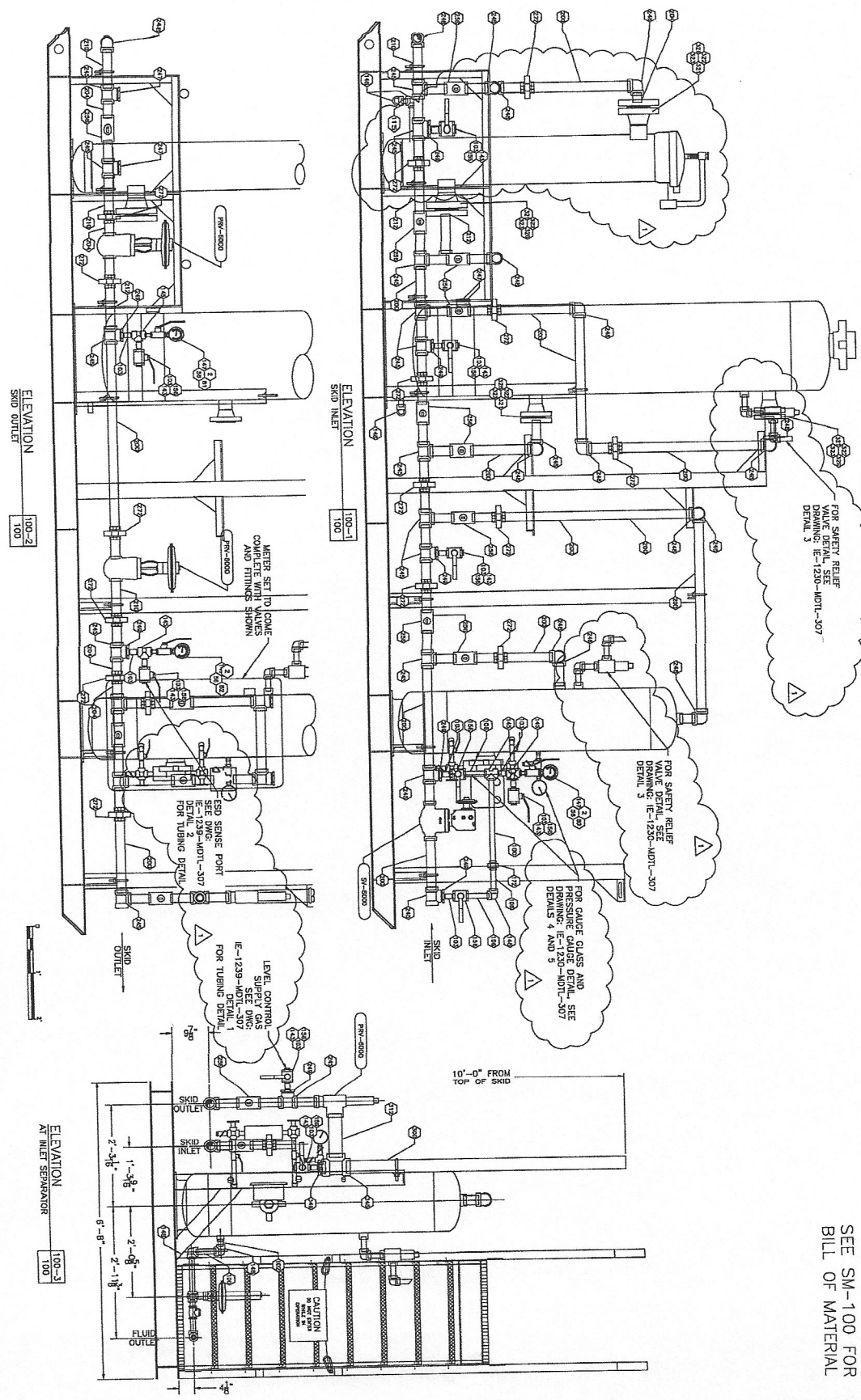
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94	1	1/2" NPT FURNACE GAS SKID	D-3171
95	1	1/2" NPT FURNACE GAS SKID	D-3171
96	1	1/2" NPT FURNACE GAS SKID	D-3171
97	1	1/2" NPT FURNACE GAS SKID	D-3171
98	1	1/2" NPT FURNACE GAS SKID	D-3171
99	1	1/2" NPT FURNACE GAS SKID	D-3171
100	1	1/2" NPT FURNACE GAS SKID	D-3171

YAVCO, INC.
100 BARBER ROAD, PHOENIX, AZ 85024
TEL: 602-998-1100

FOR: INTEGRATION ENERGY
PROJECT: FUEL GAS SKID
PLAN VIEW

DATE: 11/17/2011
DRAWN BY: JAV
CHECKED BY: JAV
SCALE: 1" = 1'-0"

SEE SM-100 FOR
BILL OF MATERIAL



- CONSTRUCTION**
- THE FOLLOWING IS RELATED TO:
 - MATERIALS
 - FABRICATION / WELDING
 - INSTALLATION / ERECTION
 - START
 - COMPLETION
 - TESTING
 - OPERATION
 - MAINTENANCE
 - REPAIRS
 - DEMOLITION

NO.	DESCRIPTION	DATE	BY	CHKD.
1	ISSUED FOR CONSTRUCTION			
2	REVISIONS			
3	CHANGED SIZE OF VALVE-3142 AND GENERAL DIMENSIONS			
4	REVISIONS			
5	REVISIONS			
6	REVISIONS			
7	REVISIONS			
8	REVISIONS			
9	REVISIONS			

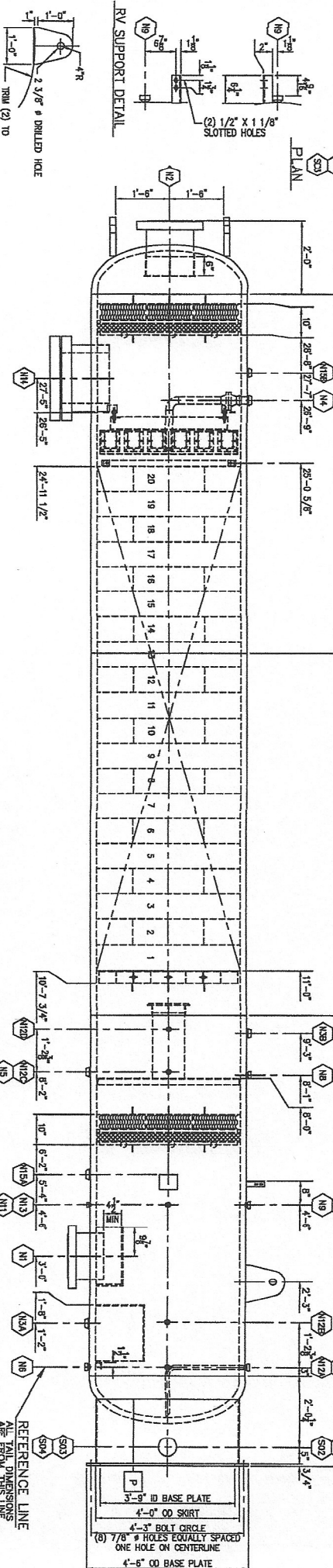
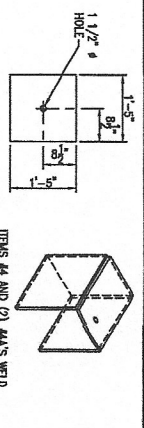
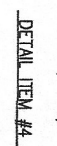
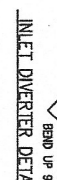
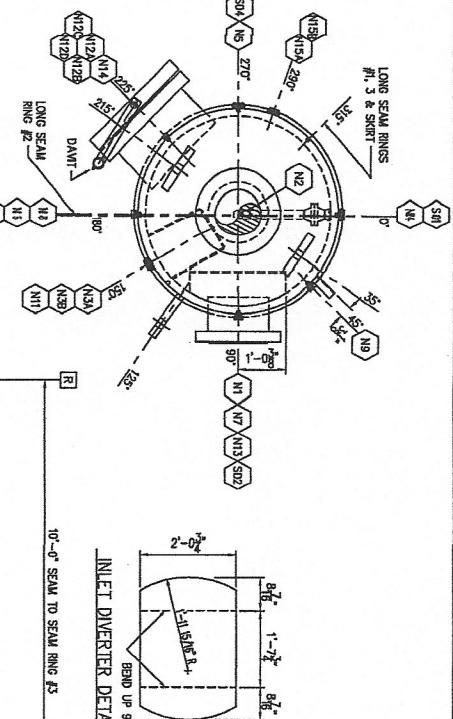
VAVCOLIC

FOR INJECTION ENERGY
FUEL GAS SKID
ELEVATION VIEWS

BY: [Name]
DATE: [Date]

SCALE: 1" = 1'-0"
DATE: 5/1/75
PROJECT: IE-1230-MDTL-307

DESIGNED BY: [Name]
CHECKED BY: [Name]
DATE: 5/1/75



RV SUPPORT DETAIL

LONG SEAM RINGS #1, 3 & SKIRT

LONG SEAM RINGS #1, 3 & SKIRT

LONG SEAM RINGS #1, 3 & SKIRT

LONG SEAM RINGS #1, 3 & SKIRT

LONG SEAM RINGS #1, 3 & SKIRT

LONG SEAM RINGS #1, 3 & SKIRT

LONG SEAM RINGS #1, 3 & SKIRT

LONG SEAM RINGS #1, 3 & SKIRT

DESIGN AND CONSTRUCTION NOTES

1. REFER TO 2017 ASME, SECT. VIII, DIV. 1, APPENDIX A, TABLE 1A FOR MATERIALS.
2. STRESS RELIEFING: 200°F MIN. FOR 1 HR.
3. WELDING PROCEDURE: ASME B31.3, SECTION VIII, DIV. 1, PART 5.
4. WELD METS: 308L & 309L FOR 304 & 304L.
5. CORROSION ALLOWANCE: HEAVY, 1/16" SKEW, 1/16" WELLS, 1/16" WELLS.
6. CORROSION ALLOWANCE: HEAVY, 1/16" SKEW, 1/16" WELLS, 1/16" WELLS.
7. MAX ALLOWABLE STRESS: 20000 PSI @ 150°F.
8. DESIGN PRESSURE: 1450 PSIA @ 150°F.
9. WIND PRESSURE: 20 PSF @ 150 MPH.
10. SEISMIC: ASME B31.3, SECTION VIII, DIV. 1, PART 5.
11. WIND PRESSURE: 20 PSF @ 150 MPH.
12. WIND PRESSURE: 20 PSF @ 150 MPH.
13. WIND PRESSURE: 20 PSF @ 150 MPH.
14. WIND PRESSURE: 20 PSF @ 150 MPH.
15. WIND PRESSURE: 20 PSF @ 150 MPH.
16. WIND PRESSURE: 20 PSF @ 150 MPH.
17. WIND PRESSURE: 20 PSF @ 150 MPH.
18. WIND PRESSURE: 20 PSF @ 150 MPH.
19. WIND PRESSURE: 20 PSF @ 150 MPH.
20. WIND PRESSURE: 20 PSF @ 150 MPH.

MARK	QTY	SIZE	RATING	PLATE	NO. OF BOLTS	SPACING	ATTACHMENT	SERVICE
N1	1	1/2"	HOOP ST. LIN.	15	1	1"	1/2" BOLT	INLET
N2	2	2"	HOOP ST. LIN.	15	2	1"	1/2" BOLT	OUTLET
N3	1	1/2"	HOOP ST. LIN.	15	1	1"	1/2" BOLT	INLET
N4	1	2"	HOOP ST. LIN.	15	1	1"	1/2" BOLT	OUTLET
N5	1	1"	HOOP ST. LIN.	15	1	1"	1/2" BOLT	INLET
N6	1	1"	HOOP ST. LIN.	15	1	1"	1/2" BOLT	OUTLET
N7	1	1"	HOOP ST. LIN.	15	1	1"	1/2" BOLT	INLET
N8	1	1"	HOOP ST. LIN.	15	1	1"	1/2" BOLT	OUTLET
N9	1	1"	HOOP ST. LIN.	15	1	1"	1/2" BOLT	INLET
N10	1	1"	HOOP ST. LIN.	15	1	1"	1/2" BOLT	OUTLET
N11	1	1"	HOOP ST. LIN.	15	1	1"	1/2" BOLT	INLET
N12	1	1"	HOOP ST. LIN.	15	1	1"	1/2" BOLT	OUTLET
N13	1	1"	HOOP ST. LIN.	15	1	1"	1/2" BOLT	INLET
N14	1	1"	HOOP ST. LIN.	15	1	1"	1/2" BOLT	OUTLET
N15	1	1"	HOOP ST. LIN.	15	1	1"	1/2" BOLT	INLET
N16	1	1"	HOOP ST. LIN.	15	1	1"	1/2" BOLT	OUTLET
N17	1	1"	HOOP ST. LIN.	15	1	1"	1/2" BOLT	INLET
N18	1	1"	HOOP ST. LIN.	15	1	1"	1/2" BOLT	OUTLET
N19	1	1"	HOOP ST. LIN.	15	1	1"	1/2" BOLT	INLET
N20	1	1"	HOOP ST. LIN.	15	1	1"	1/2" BOLT	OUTLET
N21	1	1"	HOOP ST. LIN.	15	1	1"	1/2" BOLT	INLET
N22	1	1"	HOOP ST. LIN.	15	1	1"	1/2" BOLT	OUTLET
N23	1	1"	HOOP ST. LIN.	15	1	1"	1/2" BOLT	INLET
N24	1	1"	HOOP ST. LIN.	15	1	1"	1/2" BOLT	OUTLET
N25	1	1"	HOOP ST. LIN.	15	1	1"	1/2" BOLT	INLET
N26	1	1"	HOOP ST. LIN.	15	1	1"	1/2" BOLT	OUTLET
N27	1	1"	HOOP ST. LIN.	15	1	1"	1/2" BOLT	INLET
N28	1	1"	HOOP ST. LIN.	15	1	1"	1/2" BOLT	OUTLET
N29	1	1"	HOOP ST. LIN.	15	1	1"	1/2" BOLT	INLET
N30	1	1"	HOOP ST. LIN.	15	1	1"	1/2" BOLT	OUTLET

SCHEDULE OF OPENINGS

WATER LIST NO. _____

ATTACHMENT _____

SERVICE _____

THIS DRAWING IS THE PROPERTY OF TITAN PRODUCTION EQUIPMENT, LLC & IS NOT TO BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS FURNISHED.

DATE: 12/20/18
 DRAWN BY: [Signature]
 CHECKED BY: [Signature]
 APPROVED BY: [Signature]

REVISION: _____

DESCRIPTION: _____

DATE: _____

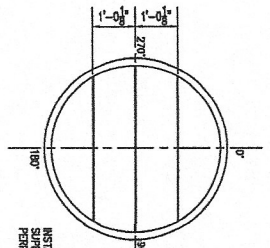
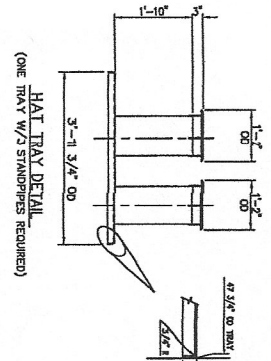
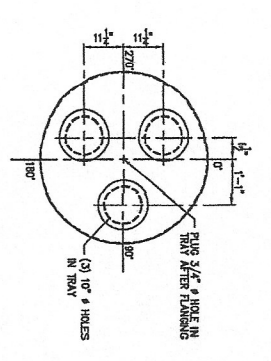
TITAN PRODUCTION EQUIPMENT, LLC
 2207 NW 57th AVENUE, SUITE 2000
 MIAMI, FL 33150

TITAN AS BUILT

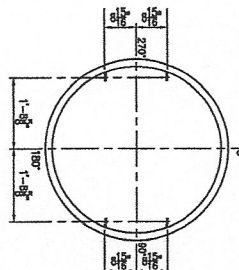
51000#

48" ID X 30'-0" S/S @ 1440#
 TITAN ASSEMBLER / SCRAPER
 W/2" S/S IN INLET AND OUTLET

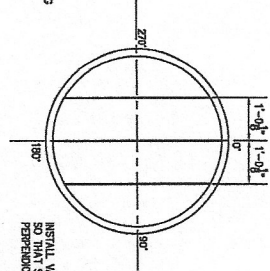
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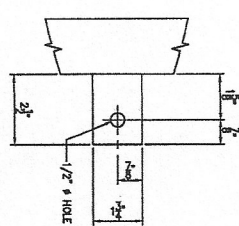
MIST EXTRACTOR / PACKING SUPPORT DETAIL
 (COMPONENTS BEFORE FLANGING & LUBRICANT NOT CLEANABLES & BEFORE MACHINE STARTING)



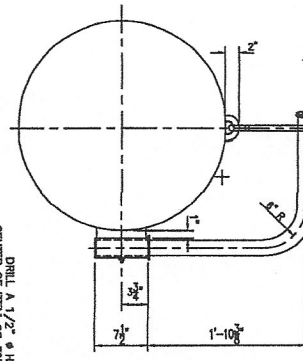
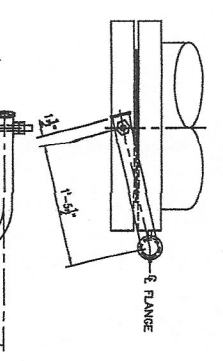
PACKING HOLD-DOWN CLIP PLAN



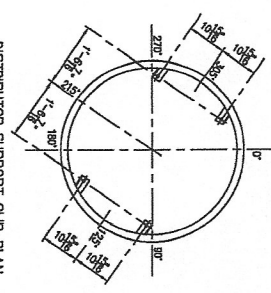
VANE HOLD DOWN DETAIL
 (POSITIONAL ABOVE UPPER & LOWER VANE)



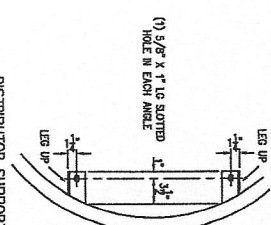
DETAIL ITEM #51



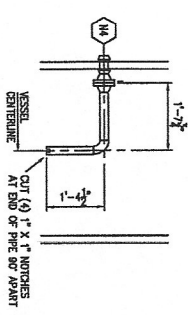
DAVIT DETAIL



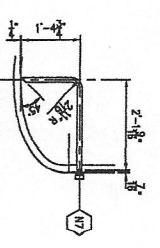
DISTRIBUTOR SUPPORT CLIP PLAN



DISTRIBUTOR SUPPORT CLIP DETAIL
 (2 OF EACH REQUIRED)



GLYCOL INLET PIPE DISTRIBUTOR DETAIL



SCRUBBER DRAIN DETAIL

TOLERANCES:
 CUTS ± 1/32"
 ANGLES ± 1/2 DEGREE
 WELD ASSEMBLIES ± 1/8"
 WELD DIM. ± .005
 BOND DIM. ± 1/32"

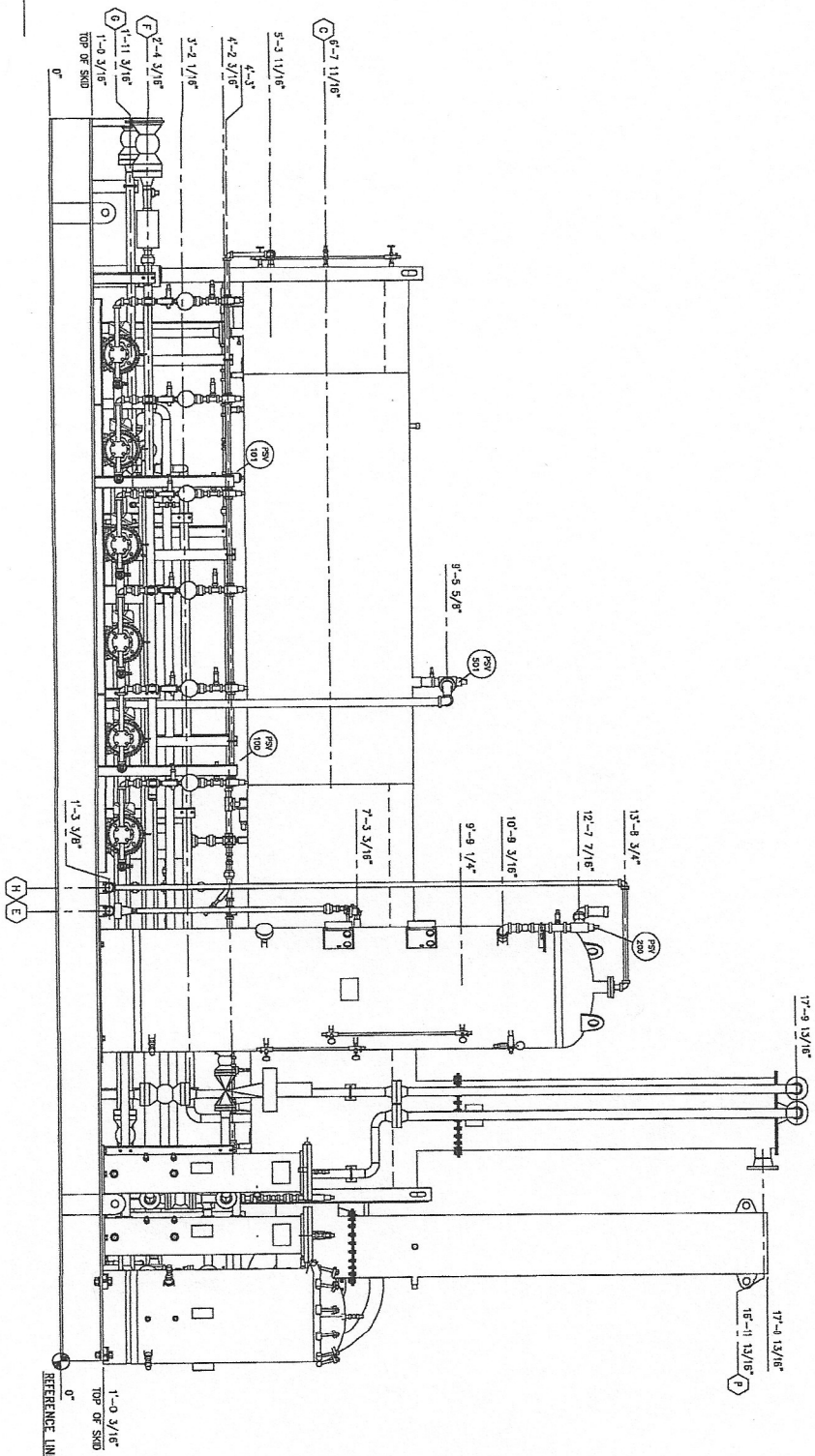
THIS DRAWING IS THE PROPERTY OF TITAN PRODUCTION EQUIPMENT, LLC AND IS NOT TO BE USED FOR ANY PURPOSE OTHER THAN THAT SPECIFICALLY FINISHED.

TITAN PRODUCTION EQUIPMENT STOCK
 2027 NATIONAL DRIVE, LLC
 4800 N. X. 300 - D S/V 9 11409 PARKED
 GRANVILLE, OH 43024
 DATE: 08-24-19
 SCALE: 1:1
 DRAWING NO. T-1001054-1102
 SHEET NO. 2 of 3

REVISION	DATE	BY	CHK	DESCRIPTION
1	02/24/20	VB		AS BUILT
2	11/21/18	RN		DESIGNED FOR CONSTRUCTION
3	09/24/18	RN		FOR CUSTOMER APPROVAL

NO.	DATE	BY	CHK	DESCRIPTION
1	08-24-19	RN		AS BUILT

TITAN PRODUCTION EQUIPMENT, LLC
 2027 NATIONAL DRIVE, LLC
 4800 N. X. 300 - D S/V 9 11409 PARKED
 GRANVILLE, OH 43024
 DATE: 08-24-19
 SCALE: 1:1
 DRAWING NO. T-1001054-1102
 SHEET NO. 2 of 3



VIEW "A-A"
SCALE 3/4"=1'-0"

- LEGEND**
- A REFRIGERATOR DRUM
 - Z 150# R/F
 - B STORAGE DRAIN
 - 1 1/2" 3000# NPT
 - C REFRIGERATOR SINKER
 - 1/2" 3000# NPT
 - D REFRIGERATOR FILL
 - 2" 3000# NPT
 - E CONDENSATE OUT OF SEPARATOR
 - 1" 3000# NPT
 - F DRY GLYCOL TO ABSORBER
 - Z 300# R/F
 - G WET GLYCOL FROM ABSORBER
 - Z 600# R/F
 - H SEPA. BACK PRESSURE OUTLET
 - 1" 3000# NPT
 - P WAPOR OUTLET FROM REFRIGERATOR
 - 4" 150# R/F
 - R DRY FUEL GAS INLET (1500# MAX)
 - 3/4" 3000# NPT

REV.	DESCRIPTION	DATE	BY	CHK.	APP'D.	REVISIONS
1	ISSUED FOR CONSTRUCTION	01/25/20	SM	NI		
2	ISSUED FOR CONSTRUCTION	11/25/19	UD	NI		
3	ISSUED FOR APPROVAL					

TITAN
REFRIGERATION EQUIPMENT, LLC
ISSUED FOR CONSTRUCTION

V-0400 FUEL GAS SCRUBBER 1.5MM BTU/HR REBOLVER
 10" O.D. X 12' H. 1.5MM BTU/HR REBOLVER
 VERTICAL W/INTERNAL SQUIRREL

V-0500 GY/GLY HEAT EXCHANGER
 10" O.D. X 12' H. 1.5MM BTU/HR REBOLVER
 PARALLEL SHEETS

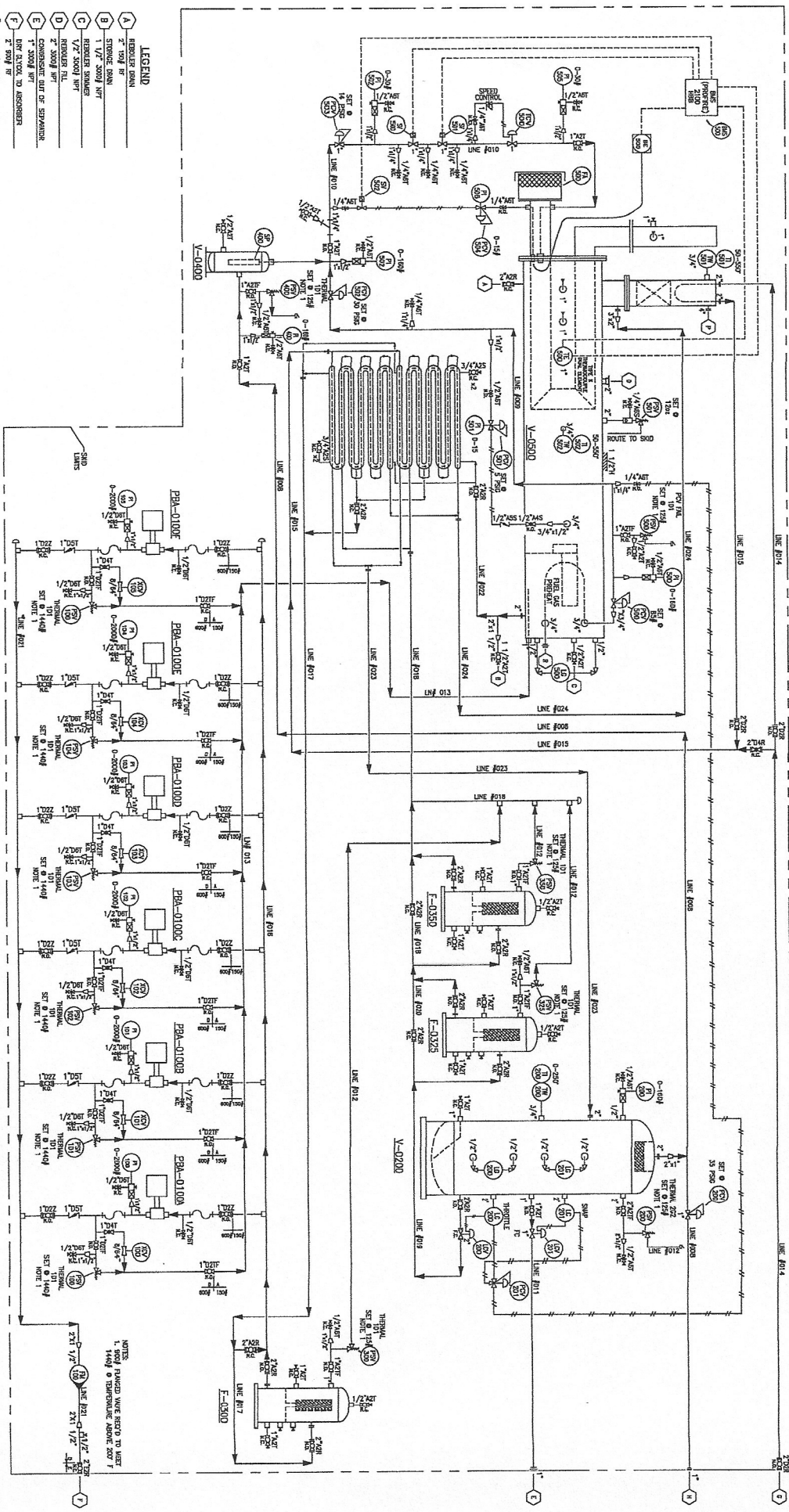
PRA-0100A/B SILICA PUMPS
 7.5 HP 1750 RPM
 10" O.D. X 12' H. 1.5MM BTU/HR REBOLVER

F-0300 SODK FILTER
 10" O.D. X 12' H. 1.5MM BTU/HR REBOLVER

F-0325 SODK FILTER
 10" O.D. X 12' H. 1.5MM BTU/HR REBOLVER

F-0350 CHARGE FILTER
 10" O.D. X 12' H. 1.5MM BTU/HR REBOLVER

V-0200 FLASH GAS SEPARATOR
 10" O.D. X 12' H. 1.5MM BTU/HR REBOLVER



- LEGEND**
- A REBOLVER HEAD
 - B STORAGE DRUM
 - C REBOLVER SHAKER
 - D REBOLVER TAIL
 - E COMPRESSOR OUT OR SEPARATOR
 - F REBOLVER TO REBOLVER
 - G WET DRYER FROM ABSORBER
 - H SEPT. BACK PRESSURE OUTLINE
 - I WARE OUTLET FROM REBOLVER
 - J 3/4" 3000 RPM

NOTES:
 1. P&ID CASE SCHEMATIC WAS IMPROVED BY CLIENT.



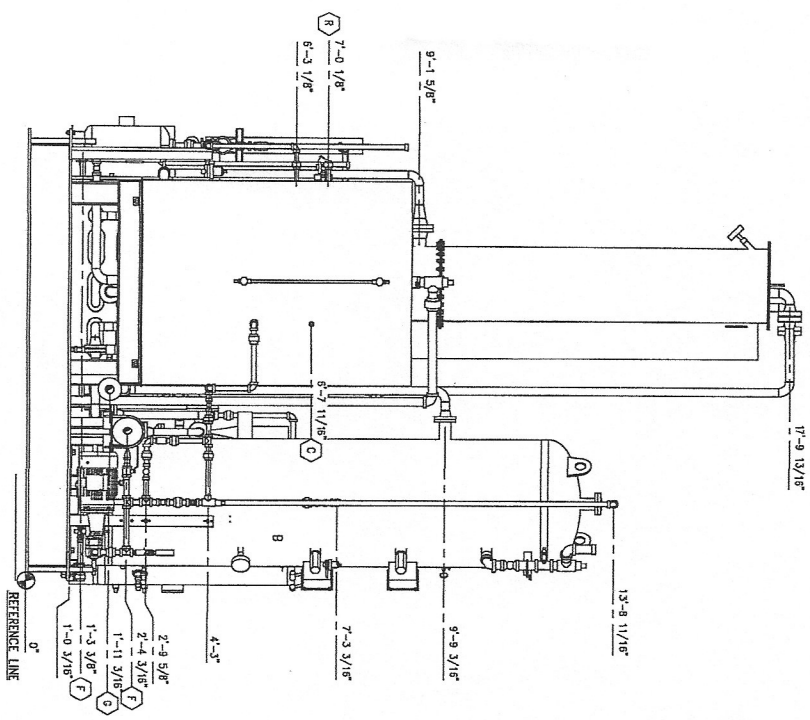
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1	ISSUED FOR CONSTRUCTION	10/20/20	MM			
2	REVISIONS AS PER CLIENT COMMENTS	11/27/19	LD	NI		
3	ISSUED FOR APPROVAL	12/11/19	LD	CR	APP'D	



NO.	DESCRIPTION	DATE	BY	CHK	APP'D	REVISIONS
1	ISSUED FOR CONSTRUCTION	10/20/20	MM			
2	REVISIONS AS PER CLIENT COMMENTS	11/27/19	LD	NI		
3	ISSUED FOR APPROVAL	12/11/19	LD	CR	APP'D	

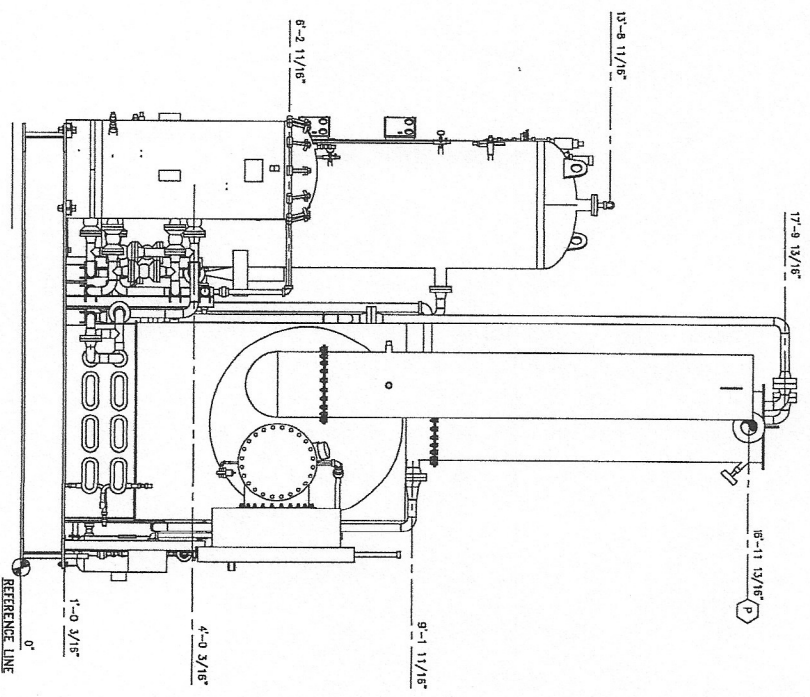
VIEW "C-C"

SCALE 3/4"=1'-0"



VIEW "D-D"

SCALE 3/4"=1'-0"



REV	DESCRIPTION	DATE	BY	CHK	APP'D	SCALE	PROJECT NO.	REVISED BY
1	ISSUED FOR CONSTRUCTION	11/25/19	LMJ	NI	J	3/4"=1'-0"	1-1010CIS-403	
2	ISSUED FOR APPROVAL	11/25/19	LMJ	NI	J	3/4"=1'-0"	1-1010CIS-403	

TITAN
 PRODUCED BY EQUIPMENT, LLC
 2025 PA 345
 ALLEN 17344 7265

TITAN
 PRODUCED BY EQUIPMENT, LLC
 ISSUED FOR CONSTRUCTION

PROJECT: INJECTION ENERGY LLC
 DRAWING: 1-1010CIS-403
 DATE: 11/25/19
 SCALE: 3/4"=1'-0"