

**TORNADO Combustion Technologies Inc.**  
**QUALITY CONTROL DATA BOOK**



**PennWest**  
c/o Pioneer Engineering

**TCTI Job No.: 13554-V**

**Lease: d-55-A/94-P-10**  
**Cordova, AB.**

**P.O.# PEI-A13370744-04**  
**AFE# A13370744**

**5'-0" dia. x 10'-0" S/S**  
**Above Ground Knockout**  
**c/w 12" dia. Inlet Conn.**



PennWest c/o Pioneer Engineering  
TCTI Job# 13554-V  
P.O. # PEI-A13370744-04  
LSD: d-55-A/94-P-10  
Jan. 2014

INDEX FOR Q.C. MANUAL AND DRAWINGS

<u>TAB NUMBER</u>	<u>DESCRIPTION</u>
1.0	Vessel ITP
2.0	Vessel Heat Sheet
3.0	Vessel MTR's (Material Test Reports)
4.0	In-House Dimensional Check Report
5.0	Hydrostatic Test Report
6.0	Vessel Blast Profile Report
7.0	Vessel Internal Coating Report
8.0	Vessel Internal Holiday Test Report
9.0	Vessel External Coating Report
10.0	Secondary Containment Blast profile Report
11.0	Secondary Containment Paint Report
12.0	Nameplate Photograph
13.0	As Built Drawings

Prepared By: LN.  
Reviewed By: AP

**TORNADO Combustion Technologies Inc.**  
#200 261200 Wagon Wheel Way  
Md of Rockyview, AB T4A 0E3  
Ph 403-244-3333  
Fax 403-275-3740



PennWest c/o Pioneer Engineering  
TCTI Job# 13554-V  
P.O. # PEI-A13370744-04  
LSD: d-55-A/94-P-10  
Jan. 2014

1.0 Vessel ITP

TORNADO Combustion Technologies Inc.  
#200 261200 Wagon Wheel Way  
Md of Rockyview, AB T4A 0E3  
Ph 403-244-3333  
Fax 403-275-3740



**TORNADO COMBUSTION  
TECHNOLOGIES INC.**

**ATMOSPHERIC VESSEL ITP**

**MAIN OFFICE**  
#200 261200  
Wagon Wheel Way  
MD od Rockyview, AB  
T4A 0E3  
Ph: 403-244-3333  
Fax: 403-275-3740

*PennWest c/o Pioneer Engineering*

Review Date: \_\_\_\_\_ Date: \_\_\_\_\_  
 Serial No.: *13554-V* Job No.: *13554-V* Vessel Typ. *HORIZONTAL*  
 Drawing No.: *PennWest - 13554* Revision No.: *0*

Seq	Item	Comments	Q.C.	Date	Hold PT	H	Date	Owner	Date
1	Release of App'd Dwg.		AL	Oct 29/13		H			
2	Heat Numbers Recorded		AL	Dec 2/13		V			
3	MTR's Checked		AL	Dec 2/13		V			
4	W.P.S. Checked		AL	Oct 29/13		V			
5	Welders Qualified		AL	Oct 29/13		V			
6	Thicknesses Recorded		AL	Dec 2/13		V			
7	Shell & Head Fitted		AL	Dec 17/13		V			
8	Nozzles & Fittings Fitted		AL	Dec 16/13		V			
9	Nozzle Orientation		AL	Dec 19/13		V			
10	Nozzle & Flange Rating Checked		AL	Dec 2/13		V			
11	Internals Checked		AL	Dec 19/13		V			
12	Final Internal Inspection		AL	Dec 19/13		V			
14	Weld Sizes Checked		AL	Dec 19/13		V			
15	Welder I.D. Checked		AL	Dec 19/13		V			
16	Final External Inspection		AL	Dec 19/13		V			
17	Radiography	N/R	/	/	/	H	/	/	/
18	M.P.I.	N/R	/	/	/	H	/	/	/
19	Hardness	N/R	/	/	/	H	/	/	/
20	Hydrostatic Test <i>22PSI</i>	Shell Gauge#	AL	Dec 23/13		H			
21	Secondary Containment Check		AL	Dec 30/13		H			
22	Sandblast Checked		AL	Dec 28/13		V			
	SSPC SP#	<i>SP 6/SP 10</i>	AL	Dec 28/13		V			
23	Exterior Painting Checked		AL	Jan 2/14		V			
	Primer/Top Coat		AL	Dec 28/13		V			
24	Internal Coating Checked		AL	Dec 31/13		V			
25	Nameplate Installation		AL	Jan 20/14		H			
26	N.C.R. #	<i>None</i>	/	/	/	V	/	/	/

Notes:  
 \_\_\_\_\_  
 \_\_\_\_\_  
*Andrew Hittle - Q.C. - AL*  
 \_\_\_\_\_  
 \_\_\_\_\_



PennWest c/o Pioneer Engineering  
TCTI Job# 13554-V  
P.O. # PEI-A13370744-04  
LSD: d-55-A/94-P-10  
Jan. 2014

2.0 Vessel Heat Sheet

TORNADO Combustion Technologies Inc.  
#200 261200 Wagon Wheel Way  
Md of Rockyview, AB T4A 0E3  
Ph 403-244-3333  
Fax 403-275-3740



TORNADO Combustion  
Technologies Inc.

# AGKO Heat Sheet

Head Office:  
#200, 261200  
Wagon Wheel Way  
MD of Rockyview, AB  
Ph. 403-244-3333  
Fax 403-275-3740

Customer:	PennWest c/o Pioneer Engineering	Date:	Jan, 2014
Stack Description:	5'-0" Dia x 10'-0" S/S AGKO c/w 12" Inlet/Outlet Conn.		
Welder(s):	Nolan Lattery	P.O.#:	PEI-A13370744-04
		Location:	Cordova, AB
		LSD:	d-55-A/94-P-10

## BILL OF MATERIALS

NO.	PART #	MATERIAL DESCRIPTION	HEAT NUMBER
1	FLG-0160	12" Dia RFWN 150# SA 105N Flange	13271, 12/34863
2	FLG-0019	2" Dia Sch 80 RFWN 150# SA 105N Flange	A87T3, 11/38305
3	FLG-0019	2" Dia Sch 80 RFWN 150# SA 105N Flange	12/72669
4	FLG-0079	2" Dia RFBL 150# SA 105N Flange	08/75402
5	FLG-0118	4" Dia Sch STD RFWN 150# SA 105N Flange	13/76392
6	FLG-0065	4" Dia RFBL 150# SA 105N Flange	12/34986
7	PFB-0019	2" Sch 80 Weld Welbow 90 deg.SA 234 WPB	12F00018
8	PFB-0034	4" Dia Sch Std 90 Deg SA 234 WPB Weld Elbow	11H00067
9	VES-0055	5'-0" OD x 3/8"thk 2:1 SE SA 516-70N Vessel Heads	G8924-874720280
10	VES-0055	5'-0" OD x 3/8"thk 2:1 SE SA 516-70N Vessel Heads	G9690-5702702341
11	PFT-0186	2" DIA. 3000# NPT SA 105N HCPLG.	K288, 3861
12	PFT-0173	2" DIA. 3000/6000# NPT SA 105N HPLUG	3065
13	PFT-0227	1/2" DIA. 3000# NPT SA 105N HCPLG.	3430, 79144
14	PFB-0038	1/2" Dia 3000# NPT SA 105N ELBOWLET	57618
15	PFT-0158	1/2" DIA. 3000/6000# NPT SA 105N HPLUG	3334
16	PFT-0174	1" DIA. 3000# NPT SA 105N HPLUG	3715
17	PIPE-0080	12" Dia Sch Std SMLS SA 106B Pipe	1333415
18	PIPE-0030	2" Dia Sch 80 SMLS SA 106B Pipe	12228185
19	PIPE-0052	4" Dia Sch Std SMLS SA 106B Pipe	10708253
20	PIPE-0033	20" Dia Sch Std SMLS SA 106B Pipe	BSM-1086
21	ORDER	3/8"thk SA 516-70N CS Plate (KO Shell)	58396
22	VES-0062	6" x 4" x 1/2"thk SA 36 CS Plate ESD Lift Lugs	6251769
23	FGL-0213/214	3/4"thk SA 36 CS Plate (Manway Flg. & Blind)	8351L
24	ORDER	3/8"thk 316L S.S. Deflector Plates	E39571
25	ORDER	3/8"thk SA 36 CS PLATE (Vessel Stand Bases)	LFH9118
26	ORDER	3/8"thk SA 36 CS PLATE (Vessel Stand & Stiffeners & Side)	0166119, R1729
27	ORDER	3/8"thk SA 36 CS PLATE (Vessel Repads)	A3F236
28	ORDER	4"DIA x 2"DIA NPS Sch std/80 SA 234 WPB Conc. Reducers	56G20156

Comments:

Q.C. Andrew+Little CET *Andrew Little*



PennWest c/o Pioneer Engineering  
TCTI Job# 13554-V  
P.O. # PEI-A13370744-04  
LSD: d-55-A/94-P-10  
Jan. 2014

**3.0 Vessel MTR's (Material Test Reports)**

**TORNADO Combustion Technologies Inc.**  
#200 261200 Wagon Wheel Way  
Md of Rockyview, AB T4A 0E3  
Ph 403-244-3333  
Fax 403-275-3740

PO# 2398 Item# 13271 Heat Number 13271  
 Shipment/Serial# 1428  
 12 - Products  
 12 - 1428  
 1 Rev'd By: 98



COMPANY WITH QUALITY MANAGEMENT SYSTEM CERTIFIED BY DNV = ISO 9001:2008 =

**CERTIFICATO DI COLLAUDO SECONDO EN 10204 - 3.1 INSPECTION CERTIFICATE**  
 Certif. N. 2448 Del/Dated 16.05.2012 Fatima / Invoice N. Del/Dated  
 DDT / Del Note N. Del/Dated Ns.Ord. / Our ref. N.  
 TRANS AM PIPING PRODUCTS LTD CA  
 9335 ENDEAVOR DRIVE S.E. CALGARY, ALBERTA

SALA PROVE E ANALISI MATERIALI / MATERIAL TEST DEPARTMENT

COD. COL. COLATA HEAT CODE/HEAT	POS. ITEM	VS. ORDINE YOUR REFERENCE	Q.T.A. Q.T.Y	DESCRIZIONE DESCRIPTION	Q.T.A. Q.T.Y	DESCRIZIONE DESCRIPTION	DIM. IN ACC. A DIM. ACCORDANCE TO	VISIVO E DIMENS. VIS. & DIMENS.	
ASTIM A105 (LADLE)	33271	60,00 W/N 150 RF 12" STD A105N	60,00	WIN 150 RF 12" STD A105N	60,00	WIN 150 RF 12" STD A105N	ASME/ANSI B16.5-2009	SATISFACTORY	
PROVETTA / TEST SPECIMEN	FORZA / TENSILE STRENGTH	ALLUNGAMENTO / ELONGATION	CONTRAZIONE / REDUCTION OF AREA	ROTTURA / TENSILE STRENGTH	ALLUNGAMENTO / ELONGATION	CONTRAZIONE / REDUCTION OF AREA	RESILLENZA / IMPACT TEST - JOULE/INCH	INDURIMENTO / HARDNESS	
126,60 50,80	341,0	30,0	58,0	539,0	30,0	58,0	20 33 37 31	163,0 - 165,0	
MATERIALE IN ACCORDO A / MATERIAL IN ACC. TO					TRATTAMENTO TERMICO / HEAT TREATMENT				
ASTIM/ASME A 105/SA 105 M - 11 ASME CODE SECT. II, PART A, ED. 2010					NORMALIZED AT 920 C - COOLED IN STILL AIR				
CSA Z245.42 GRADE 248 CAT.1					FORNO / FURNACE				
					ELECTRIC FURNACE				
					ORIGINE / ORIGIN				
					EUROPE				

COD. COL. COLATA HEAT CODE/HEAT	POS. ITEM	VS. ORDINE YOUR REFERENCE	Q.T.A. Q.T.Y	DESCRIZIONE DESCRIPTION	Q.T.A. Q.T.Y	DESCRIZIONE DESCRIPTION	DIM. IN ACC. A DIM. ACCORDANCE TO	VISIVO E DIMENS. VIS. & DIMENS.	
ASTIM A105 (LADLE)	563612	40,00 W/N 150 RF 12" STD A105N	40,00	WIN 150 RF 12" STD A105N	40,00	WIN 150 RF 12" STD A105N	ASME/ANSI B16.5-2009	SATISFACTORY	
PROVETTA / TEST SPECIMEN	FORZA / TENSILE STRENGTH	ALLUNGAMENTO / ELONGATION	CONTRAZIONE / REDUCTION OF AREA	ROTTURA / TENSILE STRENGTH	ALLUNGAMENTO / ELONGATION	CONTRAZIONE / REDUCTION OF AREA	RESILLENZA / IMPACT TEST - JOULE/INCH	INDURIMENTO / HARDNESS	
126,60 50,80	330,0	31,0	60,0	533,0	31,0	60,0	20 36 34 36	163,0 - 165,0	
MATERIALE IN ACCORDO A / MATERIAL IN ACC. TO					TRATTAMENTO TERMICO / HEAT TREATMENT				
ASTIM/ASME A 105/SA 105 M - 11 ASME CODE SECT. II, PART A, ED. 2010					NORMALIZED AT 920 C - COOLED IN STILL AIR				
					FORNO / FURNACE				
					ELECTRIC FURNACE				
					ORIGINE / ORIGIN				
					EUROPE				

NOTE: MANUFACTURING IN ACCORDANCE WITH ORDER AND SPECIFICATION	UFFICIO CONTROLLO QUALITA' / QUALITY CONTROL DEPARTMENT	ENTE UFFICIALE DI COLLAUDO / INSPECTION AUTHORITY	MARCHIO PRODUZIONE / MANUFACTURER'S SYMBOL
NOTES: MATERIAL IN ACCORDANCE WITH NACE MR-01752003 ISO 15156-2009	<i>[Signature]</i>		
MATERIAL IN ACCORDANCE WITH NACE MR-01032010			





















4" STD LR 90 BW ELBOW A234-WPB  
 Trans Am Piping Products Ltd. Rev'd By: SB  
 Heat Number: 11H00067  
 Shipment/Seg # : S 11 - 1796

Purchaser: TRANS-AM PIPING PRODUCTS LTD.

# INSPECTION CERTIFICATE



Thai Benkan Co., Ltd.  
 58 Soi Watkrumai, Bangkok, Prapachuen,  
 Samutprakarn, 10130 Thailand.

TO EN10204 3.1

No.	MFG. No.	Purchase Order No.	Job No.	Specification for Material	Specification for Inspection	Visual Examination	Dimensional Inspection	Tension Test #2								
								Yield Strength (MPa)	Tensile Strength (MPa)							
1	11H00067	CH-11-197		ASTM A234-11/ASME SA234-10 GR WPB 90 EL WPB 4 S40	ASME B16.9-2007, B16.25-2007	Good	Good	240	486							
2								240	486							
3								240	486							
4								240	486							
5								240	486							
Material Heat No.								30								
Specification																
Min.								100	1000	100	100	1000	100			
Max.								100	1000	100	100	1000	100			
Material Heat No.								30								
1	JOKB458	19	78	13	6	3	3	5	2	0	0	34	486	39	ORIGINAL	
2															COPY	
3															COPY	
4															COPY	
5															COPY	

(Note: 1) A: For formed with final temperature between 620 °C-280°C. Air Cooling. N: Normalizing 910°C±0.5 HR. Air Cooling. \*N: Normalizing 910°C±0.5 HR. Air Cooling (Specification for material made from plate). S: Stress relieving 675°C±0.5 HR. Air Cooling. The forgings were manufactured, sampled, tested and inspected in accordance with the specification, and were found to meet the requirements.

C.E. = C-Mn/6-(C+Mn+V)/5-(Ni+Cu)/15  
 We hereby certify that the product described herein has been manufactured in accordance with the specifications concerned and also with the purchaser's requirements and that the test results shown herein are correct.

\* 1: "T" symbolized wall thickness in mm. \* 2: YS Yield strength TS = Tensile strength E = Elongation  
 Form: IZ-6A/3.

Quality Assurance Manager  
 Thai Benkan Co., Ltd.

PD 20233



**edmonton exchanger**  
& manufacturing ltd.

# CERTIFICATE OF COMPLIANCE

5545-89 Street Edmonton, Alberta Canada T6E 5W9    www.edmontonexchanger.com    tel 780.468.6722 • QC fax 780.466.4668 • sales fax 780.466.5155

Customer TORNADO COMBUSTION	Po 23953	Work Order C99882	Date 2013/08/07	CofC# 42836	Page 1 of 1
-----------------------------	----------	-------------------	-----------------	-------------	-------------

Item#	Description	Qty	Heat#	Required Min Thk	Recorded Min Thk	Form. Proc.
H99882-1	HEAD(S) - Semi-Elliptical 2:1 - 0.3750" NOM (0.3125" MIN) X 60" OD (Material Spec: SA 516-70 Normalized)	1	1445M-56423	0.3125"	0.3450"	1
		1	1852M-56425	0.3125"	0.3450"	1
		1	G9690-5702702341 ✓	0.3125"	0.3450"	1
		1	G8924-874720280 ✓	0.3125"	0.3450"	1

**Forming Procedure:**  
1. Hot Formed    © 1650F/899C and Air Cooled

**Supplementary Requirements**

**Normalized Material Identification Marking:**  
 'MT' indicates normalized by the mill per ASME Code Section II, Part A, SA 20, Paragraph 13.1.1.  
 'GMT' indicates normalized by Edmonton Exchanger per ASME Code Section II, Part A, SA 20, Paragraph 13.1.2.  
 'GT' indicates normalized by Edmonton Exchanger per ASME Code Section VIII Division 1, UG-85 or ASME Code Section I, PG-77.4.

The item(s) listed above comply with the requirements of ASME Code Section I, PG-29, PG-81 and ASME Code Section VIII, Division 1, UCS-79(d), UG-79 & UG-81. All welders and procedures are qualified to ASME Code Section IX. Material being supplied conforms to the latest ASME Code Section II, Part A, 2010 Edition, Addenda July 1, 2011.

Supplementary Examination - Items

*Stock.*



edmonton exchanger  
& manufacturing ltd.

# CERTIFICATE OF COMPLIANCE

MTR List

5545-89 Street Edmonton, Alberta Canada T6E 5W9    www.edmontonexchanger.com    tel 780.468.6722 • QC fax 780.466.4668 • sales fax 780.466.5155

Customer TORNADO COMBUSTION	PO 23953	Work Order C99882	Date 2013/08/07	Co/C# 42836	Page 1 of 1
-----------------------------	----------	-------------------	-----------------	-------------	-------------

MTR ID	Pages	Heat#	Thickness	Material Grades
16430	9	G9690-5702702341	.375"	SA 516-70 N
16547	26	G8924-874720280	.375"	SA 516-70 N
16696	2	1445M-56423	.375"	SA 516-70 N
		1852M-56425	.375"	SA 516-70 N

Heat#	Material Grades	MTR ID
1445M-56423	SA 516-70 N	16696
1852M-56425	SA 516-70 N	16696
G8924-874720280	SA 516-70 N	16547
G9690-5702702341	SA 516-70 N	16430





edmonton exchanger  
& manufacturing ltd.

# CERTIFICATE OF COMPLIANCE

5545-89 Street Edmonton, Alberta Canada T6E 5W9 www.edmontonexchanger.com tel 780.468.6722 • QC fax 780.466.4668 • sales fax 780.466.5155

Customer TORNADO COMBUSTION PO 23953 Work Order C99882 Date 2013/08/07 Co/C# 42836 Page 1 of 1

Item#	Description	Qty	Heat#	Required Min Thk	Recorded Min Thk	Form. Proc.
H99882-1	HEAD(S) - Semi-Elliptical 2:1 - 0.375" NOM (0.3125" MIN) X 60" OD (Material Spec: SA 516-70 Normalized)	1	1445M-56423	0.3125"	0.3450"	1
		1	1852M-56425	0.3125"	0.3450"	1
		1	G9690-5702702341	0.3125"	0.3450"	1
		1	G8924-874720280	0.3125"	0.3450"	1

**Forming Procedure:**

1. Hot Formed @ 1650F/899C and Air Cooled

**Supplementary Requirements**

**Normalized Material Identification Marking:**

'MT' Indicates normalized by the mill per ASME Code Section II, Part A, SA 20, Paragraph 13.1.1.

'GMT' Indicates normalized by Edmonton Exchanger per ASME Code Section II, Part A, SA 20, Paragraph 13.1.2.

'GT' Indicates normalized by Edmonton Exchanger per ASME Code Section VIII Division 1, UG-85 or ASME Code Section I, PG-77.4.

The item(s) listed above comply with the requirements of ASME Code Section I, PG-29, PG-81 and ASME Code Section VIII, Division 1, UCS-79(d), UG-79 & UG-81. All welders and procedures are qualified to ASME Code Section IX. Material being supplied conforms to the latest ASME Code Section II, Part A, 2010 Edition, Addenda July 1, 2011.

**Supplementary Examination - Items**



edmonton exchanger  
& manufacturing ltd.

# CERTIFICATE OF COMPLIANCE

MTR List

5545-89 Street Edmonton, Alberta Canada T6E 5W9    www.edmontonexchanger.com    tel 780.468.6722 • QC fax 780.466.4668 • sales fax 780.466.5155

Customer TORNADO COMBUSTION    po 23953    Work Order C99882    Date 2013/08/07    CofC# 42836    Page 1 of 1

MTR ID	Pages	Heat#	Thickness	Material Grades
16430	9	G9690-5702702341	.375"	SA 516-70 N
16547	26	G8924-874720280	.375"	SA 516-70 N
16696	2	1445M-56423	.375"	SA 516-70 N
		1852M-56425	.375"	SA 516-70 N

Heat#	Material Grades	MTR ID
1445M-56423	SA 516-70 N	16696
1852M-56425	SA 516-70 N	16696
G8924-874720280	SA 516-70 N	16547
G9690-5702702341	SA 516-70 N	16430









**MILL TEST & INSPECTION CERTIFICATE**

ACCORDING TO EN 10204 : 2004 3.1

CUSTOMER : SEYFOLD INTERNATIONAL CORP.

CERT. NO : 123084

ORDER NO : 7005764

INVOICE NO : BW01210105096

L/C NO :

DATE : 09/01/2012

PAGE : 15

ORIGIN : TAIWAN

**油蔴地工業股份有限公司**

高雄赤仁武區高林里仁心路 303 號

**DOTI-WEI STEEL FITTINGS CO., LTD.**

NO.303, JEN-HSIN ROAD JEN-WU DISTRICT

KAOHSIUNG CITY, TAIWAN R.O.C. (81460)

TEL: 866-7-871-0497, 871-1586, 372-0260

web site: http://www.botiwell.com.tw e-mail: botiwell@botiwell.com.tw

An ISO 9001:2008 Registered Manufacturer



№ 1W110220

FAX: 866-7-871-8884, 871-8882



ITEM	HT. CD.	RAW MATERIAL HEAT NO.	DESCRIPTION	QUANTITY		SPECIFICATION FOR		INSPECTION SURFACE	DIM.
				MATERIAL	FITTING	MATERIAL	FITTING		
033	3742	326701	HALF CPLG 1-1/4" 3000# NPT	100 PC	ASME B16.11 - 2011	ASTM A105N -05			
034	3861	329612	HALF CPLG 2" 3000# NPT	1200 PC		ASME SA105N -A08			
035	3747	326703	HALF CPLG(NO STEP) 1-1/2" 3000# NPT	50 PC					
036	3851	329600	90D STREET ELBOW 1/4" 3000# NPT	350 PC					GOOD
037	3849	329614	90D STREET ELBOW 3/8" 3000# NPT	50 PC					GOOD

ITEM	BW HT. CD.	CHEMICAL COMPOSITION (%)											MATERIAL SUPPLIER					
		C	Si	Mn	P	S	Cu	Cr	Ni	Mo	V	Cb(Nb)		N	Al	Ti	Zr	CE
033	3742	0.200	0.10	0.60	0.035	0.040	0.40	0.12	0.08	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.378
034	3861	0.190	0.210	0.840	0.017	0.007	0.140	0.130	0.020	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.374
035	3747	0.210	0.200	0.850	0.016	0.012	0.160	0.090	0.020	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.388
036	3851	0.210	0.230	0.810	0.012	0.007	0.160	0.090	0.020	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.383
037	3849	0.180	0.210	0.820	0.015	0.008	0.150	0.120	0.020	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.358

ITEM	BW HT. CD.	MECHANICAL PROPERTIES						HEAT TREATMENT	ADDITIONAL TEST /REMARKS
		T. S. (KSI)	Y. S. (KSI)	EL. (%)	R of A (%)	Hardness (HB)(AVG)	Charpy Impact F / 0 C ( Joule )		
033	3742	75.4	48.6	32.6	65.5	145	144	NORMALIZED	CONFORMS TO NACE MR0175-09 /MR0103-10 STEEL MAKING PROCESS : ELECTRIC FURNACE CONFORMS TO NACE ISO15156-3 2009
034	3861	75.5	48.7	32.6	64.5	143	146		
035	3747	74.5	48.9	32.4	63.6	144	144		
036	3851	74.4	48.3	34.2	66.4	141	142	860°C A.C.	
037	3849	74.1	51.5	33.2	62.2	141	143		

WE HEREBY CERTIFY, THAT THE MATERIAL DESCRIBED ABOVE HAS BEEN TESTED AND COMPLIES WITH THE TERMS OF THE ORDER CONTRACT.

**C.C. Huang**  
 Q.C. MANAGER  
 CHEN CEI HUANG

**Y.Y. Chang**  
 INSPECTOR  
 YUAN YAO CHANG

**MILL TEST & INSPECTION CERTIFICATE**

ACCORDING TO EN 10204 :2004 3.1

CUSTOMER : TRANS AM  
CERT. NO : 100529 L/C NO :  
ORDER NO : 7002037(CI-09-483) DATE : 02/24/2010  
INVOICE NO : BW09812119 PAGE : 22 ORIGIN : TAIWAN



**柏緯鐵工股份有限公司**  
高雄縣仁武鄉高林村仁心路 303 號  
**BOTH-WELL STEEL FITTINGS CO., LTD.**  
NO.303, JEN-HSIN ROAD JEN-WU HSIANG  
KAOHSIUNG HSIEN, TAIWAN R.O.C.(81460)  
TEL: 886-7-371-0497, 371-1536, 372-0260  
FAX: 886-7-371-3864, 371-3862  
web site: http://www.bwthwell.com.tw e-mail: bwthwell@www.bwthwell.com.tw

An ISO 9001:2000 Registered Manufacturer



ITEM	HT. CD.	RAW MATERIAL HEAT NO.	DESCRIPTION	QUANTITY		SPECIFICATION FOR			INSPECTION SURFACE	DIM.
				MATERIAL	FITTING	MATERIAL	FITTING	SURFACE		
077	3065	305702	HEX PLUG 2" NPT			ASTM A105N -05	ASME B16.1 -2005		GOOD	GOOD
077	3086	306668	HEX PLUG 2" NPT							
078	3084	305559	HEX PLUG 2-1/2" NPT							
079	3082	305703	HEX PLUG 3" NPT							
080	3027	304942	HEX PLUG 4" NPT							

ITEM	BW HT. CD.	CHEMICAL COMPOSITION (%)														MATERIAL SUPPLIER		
		C	Si	Mn	P	S	Cu	Cr	Ni	Mo	V	Cb(Nb)	N	Al	Ti		Zr	CE
077	3065	0.190	0.190	0.850	0.025	0.014	0.130	0.120	0.400	0.120	0.080	-	-	-	-	-	-	0.001
077	3086	0.200	0.190	0.820	0.021	0.017	0.140	0.070	0.060	0.010	0.002	0.001	-	-	-	-	-	0.002
078	3084	0.200	0.230	0.880	0.028	0.013	0.130	0.160	0.050	0.010	0.002	0.001	-	-	-	-	-	0.002
079	3082	0.190	0.180	0.840	0.015	0.017	0.170	0.090	0.060	0.010	0.002	0.001	-	-	-	-	-	0.002
080	3027	0.200	0.200	0.850	0.019	0.015	0.140	0.110	0.050	0.010	0.002	0.001	-	-	-	-	-	0.002

ITEM	BW HT. CD.	MECHANICAL PROPERTIES										HEAT TREATMENT	ADDITIONAL TEST/REMARKS					
		T. S. (KSI)	Y. S. (KSI)	EL. (%)	R of A (%)	Hardness (HB)(AVG)	Charpy Impact °F / 0 °C			MIN./AVG. / ( Joute )								
077	3065	77.8	51.0	31.6	65.9	145												
077	3086	77.8	51.0	32.6	63.7	144												
078	3084	77.3	52.5	33.2	67.8	144												
079	3082	78.4	49.2	33.0	66.5	147												
080	3027	75.7	50.9	33.2	65.5	143												

WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED ABOVE HAS BEEN TESTED AND COMPLETES WITH THE TERMS OF THE ORDER CONTRACT.

*C.C. Idair*  
Q.C. MANAGER  
CHIN CHENG HSIEN

*Y.-Y. Chang*  
INSPECTOR  
YUAN YAO CHANG

1. Order # 19751  
 2. Treatment # 19751  
 3. Treatment / Shipments # 19751  
 4. Shipments / Shipments # 19751  
 5. Treatment # 19751  
 6. Treatment # 19751  
 7. Treatment # 19751  
 8. Treatment # 19751  
 9. Treatment # 19751  
 10. Treatment # 19751  
 11. Treatment # 19751  
 12. Treatment # 19751  
 13. Treatment # 19751  
 14. Treatment # 19751  
 15. Treatment # 19751  
 16. Treatment # 19751  
 17. Treatment # 19751  
 18. Treatment # 19751  
 19. Treatment # 19751  
 20. Treatment # 19751  
 21. Treatment # 19751  
 22. Treatment # 19751  
 23. Treatment # 19751  
 24. Treatment # 19751  
 25. Treatment # 19751  
 26. Treatment # 19751  
 27. Treatment # 19751  
 28. Treatment # 19751  
 29. Treatment # 19751  
 30. Treatment # 19751  
 31. Treatment # 19751  
 32. Treatment # 19751  
 33. Treatment # 19751  
 34. Treatment # 19751  
 35. Treatment # 19751  
 36. Treatment # 19751  
 37. Treatment # 19751  
 38. Treatment # 19751  
 39. Treatment # 19751  
 40. Treatment # 19751  
 41. Treatment # 19751  
 42. Treatment # 19751  
 43. Treatment # 19751  
 44. Treatment # 19751  
 45. Treatment # 19751  
 46. Treatment # 19751  
 47. Treatment # 19751  
 48. Treatment # 19751  
 49. Treatment # 19751  
 50. Treatment # 19751  
 51. Treatment # 19751  
 52. Treatment # 19751  
 53. Treatment # 19751  
 54. Treatment # 19751  
 55. Treatment # 19751  
 56. Treatment # 19751  
 57. Treatment # 19751  
 58. Treatment # 19751  
 59. Treatment # 19751  
 60. Treatment # 19751  
 61. Treatment # 19751  
 62. Treatment # 19751  
 63. Treatment # 19751  
 64. Treatment # 19751  
 65. Treatment # 19751  
 66. Treatment # 19751  
 67. Treatment # 19751  
 68. Treatment # 19751  
 69. Treatment # 19751  
 70. Treatment # 19751  
 71. Treatment # 19751  
 72. Treatment # 19751  
 73. Treatment # 19751  
 74. Treatment # 19751  
 75. Treatment # 19751  
 76. Treatment # 19751  
 77. Treatment # 19751  
 78. Treatment # 19751  
 79. Treatment # 19751  
 80. Treatment # 19751  
 81. Treatment # 19751  
 82. Treatment # 19751  
 83. Treatment # 19751  
 84. Treatment # 19751  
 85. Treatment # 19751  
 86. Treatment # 19751  
 87. Treatment # 19751  
 88. Treatment # 19751  
 89. Treatment # 19751  
 90. Treatment # 19751  
 91. Treatment # 19751  
 92. Treatment # 19751  
 93. Treatment # 19751  
 94. Treatment # 19751  
 95. Treatment # 19751  
 96. Treatment # 19751  
 97. Treatment # 19751  
 98. Treatment # 19751  
 99. Treatment # 19751  
 100. Treatment # 19751

**MILL TEST & INSPECTION CERTIFICATE**

ACCORDING TO EN 10204 :2004 3.1

CUSTOMER : TRANS AM  
 CERT. NO : 112123  
 ORDER NO : 7003841 (CI-11-155)  
 INVOICE NO : BW01110002012  
 L/C NO :  
 DATE : 06/13/2011  
 PAGE : 6 ORIGIN : TAIWAN



**柏緯鐵工股份有限公司**  
 高雄縣仁武鄉烏林村仁心路 303 號  
**BOTHWELL STEEL FITTINGS CO., LTD.**  
 NO.303, JEN-HSIN ROAD JEN-WU HSIANG  
 KAHSIUNG HSIEN, TAIWAN R.O.C.(81460)  
 TEL: 886-7-371-0497, 371-1536, 372-0260  
 FAX: 886-7-371-8864, 371-3882  
 web site: http://www.bothwell.com.tw e-mail: bothwell@bothwell.com.tw or bowt@bothwell.com.tw

An ISO 9001:2008 Registered Manufacturer



ITEM	HT. CD.	RAW MATERIAL HEAT NO.	DESCRIPTION	CHEMICAL COMPOSITION (%)											QUANTITY	SPECIFICATION FOR MATERIAL		INSPECTION					
				C	Si	Mn	P	S	Cu	Cr	Ni	Mo	V	Cb(Nb)		N	Al	Ti	Zr	CE	MATERIAL	FITTING	SURFACE
029	3365	316685	FULL CPLG 2" 3000# NPT	0.350	0.190	0.200	0.190	0.040	0.400	0.300	0.400	0.120	0.080	-	-	-	-	-	-	ASTM A105N -09	ASME 316.11 - 2009	GOOD	GOOD
030	3520	320981	FULL CPLG(NO STEP) 1-1/2" 3000# NPT	0.190	0.200	0.190	0.017	0.014	0.150	0.100	0.070	0.020	0.002	0.001	-	-	-	-	-	ASME SA105N		GOOD	GOOD
031	2907	302144	HALF CPLG 1/4" 3000# NPT	0.190	0.200	0.190	0.018	0.014	0.150	0.100	0.070	0.020	0.002	0.001	-	-	-	-	-				
032	2902	302144	HALF CPLG 3/8" 3000# NPT	0.190	0.200	0.190	0.011	0.013	0.150	0.080	0.060	0.010	0.002	0.001	-	-	-	-	-				
033	3430	318525	HALF CPLG 1/2" 3000# NPT	0.200	0.190	0.190	0.019	0.014	0.130	0.130	0.070	0.020	0.002	0.001	-	-	-	-	-				
ITEM	BW HT. CD.			MECHANICAL PROPERTIES											ADDITIONAL TEST/REMARKS								
ITEM	HT. CD.	T. S. (KSI)	Y. S. (KSI)	EL. (%)	R of A (%)	Hardness (HB)(AVG)	Charpy Impact			HEAT TREATMENT	CONFORMS TO NACE MR0175-09 /MR0103-10 STEEL MAKING PROCESS : ELECTRIC FURNACE												
							MIN./AVG.	1	2						3	AVG.							
029	3365	73.4	51.4	34.6	74.6	142	143	187		NORMALIZED													
030	3520	75.4	50.5	36.0	66.4	143	143			860°C A.C.													
031	2907	75.0	51.6	33.8	65.8	144	142																
032	2907	75.0	51.6	33.8	65.8	144	142																
033	3430	74.9	48.4	35.6	64.5	141	142																
WE HEREBY CERTIFY, THAT THE MATERIAL DESCRIBED ABOVE HAS BEEN TESTED AND COMPLIES WITH THE TERMS OF THE ORDER CONTRACT.													C.C. Huang Q.C. MANAGER CHEN CHI HUANG				INSPECTOR YUAN YAO CHANG						

Ⓢ BW-D0839 REV:1

HEAT NUMBER : 79144  
 TRANS AM PIPING PRODUCTS - REV'D BY: [Signature]  
 1/2" CL 3000 FS SCRD HALF (1/2) SHIPMENT/SEG # : 8 - 1175 24



**INDUSTRIA MECCANICA LIGURE SPA**

16030 CASARZA LIGURE - Genova - Italy - Via Giancarlo Ferrisa 2/E - Tel.010.68.487061 - Fax.010.68.466510 / MATERIAL TEST DEPARTMENT This certificate has been generated by computer and need not to be signed for validity according to DIN EN 10204 Page 13 - 18

INSPECTION CERTIFICATE EN 10204:2004 /3.1  
 COMPANY WITH QUALITY SYSTEM ISO 9001:2000  
 CERTIFIED BY RINA  
 TRANS AM PIPING PRODUCTS LTD.  
 Certificate Nr 16653  
 Invoice Nr  
 9235 Endeavor Drive S.E  
 Calgary, Alberta T3S 0A1  
 CA  
 Dated 24.04.2008  
 Dated 24.04.2008

HEAT CODE	HEAT	ITEM	ITEM	YOUR P.O.	OUR REFERENCE	Q.TY	DESCRIPTION	DIM. ACC. TO	VISUAL & DIMENS.												
									SEE NOTE	SATISFACTORY											
UX4	70294	110	CI-08 - 114	2008-2E201-0000032-110		FITTING CAP SW 3/4" A105N		SEE NOTE	SATISFACTORY												
UX5	71549	122	CI-08 - 114	2008-2E201-0000032-122		FITTING UNION FF THRD NPT 3M 1" A105N EL GALV. (NUT)		SEE NOTE	SATISFACTORY												
A64	71764	130	CI-08 - 114	2008-2E201-0000032-130		FITTING ROUND H.PLUG THRD NPT 3/4" A350/LF2		SEE NOTE	SATISFACTORY												
HH8	77612	003	CI-08 - 114	2008-2E201-0000032-137		FITTING 90 ELB. THRD NPT 3M 3/4" A105N		SEE NOTE	SATISFACTORY												
HH8	22469	039	CI-08 - 114	2008-2E201-0000032-138		FITTING CROSS THRD NPT 3M 3/4" A105N		SEE NOTE	SATISFACTORY												
HH8	71759	008	CI-08 - 118	2008-2E201-0000041-008		CONC. SWAGE TBE NPT S-80 1"x3/4" MSS SP 55 WPB		SEE NOTE	SATISFACTORY												
HH8	79144	035	CI-08 - 236	2008-2E201-0000354-035		FITTING HALF COUPL THRD NPT 3M 1/2" A105N		SEE NOTE	SATISFACTORY												
HEAT CODE	HEAT	ITEM	ITEM	MATERIAL	C %	S1%	MIN%	PV%	CR%	NI%	MO%	Ti%	Cu%	V%	NP%	N%	AL%	C.E. %	OTHER ELEMENTS		
UX4	70294	110	ASTM A105		0.180	0.230	0.850	0.022	0.016	0.110	0.060	0.020	0.006	0.230	0.001	0.001	0.000	0.025	0.367		
UX5	71549	122	ASTM A105		0.195	0.250	0.960	0.023	0.013	0.180	0.050	0.005	0.170	0.002	0.001	0.000	0.015	0.408			
A64	79144	130	ASTM A350 LF2 cl.1		0.200	0.280	0.970	0.002	0.008	0.100	0.160	0.004	0.150	0.003	0.002	0.000	0.013	0.398			
HH8	77612	003	ASTM A105		0.195	0.290	0.890	0.018	0.016	0.140	0.050	0.010	0.005	0.200	0.002	0.001	0.000	0.032	0.395		
HH8	22469	039	ASTM A105		0.180	0.290	0.900	0.021	0.013	0.100	0.060	0.010	0.005	0.190	0.002	0.001	0.000	0.004	0.374		
HH8	71759	008	ASTM A234 WPB		0.200	0.250	0.850	0.017	0.010	0.090	0.080	0.010	0.007	0.170	0.001	0.002	0.000	0.032	0.358		
HH8	79144	035	ASTM A105		0.200	0.250	0.960	0.019	0.010	0.070	0.050	0.010	0.006	0.140	0.001	0.001	0.000	0.026	0.389		
HEAT CODE <th>HEAT</th> <th>ITEM</th> <th colspan="2">TEST SPECIMEN</th> <th>YIELD POINT</th> <th>TENSILE STRENGTH</th> <th>ELONGATION</th> <th>REDUCTION OF AREA</th> <th>HARDNESS</th> <th colspan="3">BEND TEST</th> <th colspan="3">FLATTENING TEST</th> <th colspan="3">IMPACT TEST - JOULLE</th> <th rowspan="2">SHAPE</th> <th rowspan="2">YIELD POINT</th>	HEAT	ITEM	TEST SPECIMEN		YIELD POINT	TENSILE STRENGTH	ELONGATION	REDUCTION OF AREA	HARDNESS	BEND TEST			FLATTENING TEST			IMPACT TEST - JOULLE			SHAPE	YIELD POINT	
HEAT CODE	HEAT	ITEM	RECT. mm	LENDIT mm	MINI% 3=0.2%	MINI% 3=3%	%	%	R <sub>0.2</sub>	R <sub>m</sub>	H <sub>0.01</sub>	H <sub>0.01</sub>	H <sub>0.01</sub>	H <sub>0.01</sub>	H <sub>0.01</sub>	H <sub>0.01</sub>	H <sub>0.01</sub>	IN-O 2=			MINI% 3=0.2%
UX4	70294	110	122.65	50.00	305.0	488.0	33.5	59.0	163 - 168	0.0	0.0	0.0	0.0	KV	20	98	100	111	1	0.0	
UX5	71549	122	122.65	50.00	305.0	563.0	31.0	54.0	160 - 166	0.0	0.0	0.0	0.0	KV	20	105	100	109	1	0.0	
A64	79144	130	122.65	50.00	317.0	522.0	32.2	53.5	160 - 165	0.0	0.0	0.0	0.0	KV	20	85	91	93	1	0.0	
HH8	77612	003	122.65	50.00	336.0	546.0	31.0	54.0	160 - 166	0.0	0.0	0.0	0.0	KV	20	94	92	90	1	0.0	
HH8	22469	039	122.65	50.00	312.0	549.0	32.0	54.0	162 - 166	0.0	0.0	0.0	0.0	KV	20	99	104	101	1	0.0	
HH8	71759	008	122.65	50.00	351.0	533.0	33.0	57.5	162 - 169	0.0	0.0	0.0	0.0	KV	20	58	55	50	1	0.0	
HH8	79144	035	122.65	50.00	321.0	521.0	32.8	54.0	169 - 171	0.0	0.0	0.0	0.0	KV	20	99	102	107	1	0.0	
MATERIAL IN ACCORDANCE TO																					
UX4	70294	110			ASME SA ASTM A105-05		Normalized at 880°-920°C / Air Cool					ELECTRIC FURNACE			Our Ref.						
UX5	71549	122			ASME SA ASTM A105-05		Normalized at 880°-920°C / Air Cool					ELECTRIC FURNACE			071528						
A64	79144	130			ASME SA ASTM A350-04a Gr. LF2 cl.1		Normalized at 900°C / Air Cool					ELECTRIC FURNACE			062125						
HH8	77612	003			ASME SA ASTM A105-05		Normalized at 880°-920°C / Air Cool					ELECTRIC FURNACE			062126						
HH8	22469	039			ASME SA ASTM A105-05		Normalized at 880°-920°C / Air Cool					ELECTRIC FURNACE			071499						
HH8	71759	008			ASME SA ASTM A105-05		Normalized at 880°-920°C / Air Cool					ELECTRIC FURNACE			051400						
HH8	79144	035			ASME SA ASTM A234/A234M-07 Gr. WPB		Normalized at 880°-920°C / Air Cool					ELECTRIC FURNACE			061270						
NOTES ASME B16.11/05 - ANSI B31.1/B31.3 - IML STD - ANSI B1.1-B18.2.2 - NACE MR0175 ISO 15156/1 - NACE MR103 - MSS SP 83 - SUPPLIED MATERIAL MEETS SPECIFICATIONS AND P.O. REQUIREMENTS																					
INSPECTION AUTHORITY													QUALITY CONTROL DEPARTMENT			MANUFACTURER'S SYMBOL			MANUFACTURER'S SYMBOL		
BORIS FIZZOTTI											FITTINGS			IML			STUDBOLTS				

HEAT NUMBER : 57618  
 TRANS AM PIPING PRODUCTS - REV'D BY:  1/2X3/4-36 CL 3000 FS SCR D ELBOW  
 Shipment/Seq #: S 9 - 1356 1 PIPET A105N



Sold To: TRANS AM PIPING PRODUCTS  
 LTD  
 9335 ENDEAVOR DRIVE S.E.  
 CALGARY AB T3S 0A1

Mtr #: 171,973

PO #: CI-09-286


Sales Order #: C000906476

Date: 06/09/2009


This product has not come in direct contact with mercury or any of its compounds, nor with any mercury-containing device employing a single boundary of containment. No welding performed.

We certify that the contents of this report are correct and accurate, and that all test results and operations performed by WFL or its subcontractors are in compliance with the material specification and requirements of the referenced code or standard, and that the material conforms to the dimensional requirements of the order. This document is in accordance with EN10204 3.1.

Certified Material Test Report

Heat Code: 57618 

Material: A/SA105N 01

Item	Quantity	Description
1		36 - 3/4 X 1/2 3M TEP A/SA105N 

Chemical Composition

Ladle	C	CR	CU	MN	MO	NI	NI	P
	0.180	0.10	0.190	0.80	0.018	0.011	0.07	0.008
	S	SI	V					
	0.030	0.23	0.002					
Carbon Equivalency:		Ladle		0.36				

Product	Tensile PSI	Yield PSI	Elong %	RA %	Hardness
	72,750	49,625	32.45	63.25	132 BHN
					132 BHN 

I. IN ACCORDANCE WITH NACE SPEC MR0175-2002

Normalized

**MILL TEST & INSPECTION CERTIFICATE**

ACCORDING TO EN 10204 :2004 3.1

CUSTOMER : TRANS AM  
 CERT. NO : 110536 L/C NO :  
 ORDER NO : 7003364 (CI-10-501) DATE : 03/12/2011  
 INVOICE NO : EW109911056 PAGE : 21 ORIGIN : TAIWAN



**柏緯鐵工股份有限公司**  
 高雄縣仁武鄉為林村仁心路 303 號  
**BOTH-WELL STEEL FITTINGS CO., LTD.**  
 NO.303, JEN-HSIN ROAD JEN-WU HSIANG  
 KAOSHIUNG HSIEN, TAIWAN R.O.C.(81460)  
 TEL: 886-7-871-0497, 871-1586, 372-0260  
 web site : http://www.bothwell.com.tw e-mail: bothwell@www.bothwell.com.tw

An ISO 9001:2008 Registered Manufacturer  
  
  
 FAX: 886-7-371-8864, 371-8882

ITEM	EW HT. CD.	RAW MATERIAL HEAT NO.	DESCRIPTION	QUANTITY	SPECIFICATION FOR		INSPECTION SURFACE	DIM.									
					MATERIAL	FITTING											
077	3412	317783	HEX PLUG 1/4" NPT		ASTM A105N -09	ASME B16.11 - 2009	GOOD	GOOD									
078	3308	315346	HEX PLUG 3/8" NPT														
079	3334	315764	HEX PLUG 1/2" NPT														
080	3373	316850	HEX PLUG 3/4" NPT														
081	3237	310181	HEX PLUG 1-1/4" NPT														
ITEM	EW HT. CD.	CHEMICAL COMPOSITION (%)															
Min		C	Si	Mn	P	S	Cu	Cr	Ni	Mg	V	Cb(Nb)	N	Al	Ti	Zr	CE
Max		0.550	0.100	0.600	0.035	0.040	0.400	0.300	0.400	0.120	0.080	-	-	-	-	-	0.430
077	3412	0.200	0.180	0.840	0.020	0.014	0.210	0.140	0.080	0.020	0.002	0.001	-	-	-	-	0.392
078	3308	0.190	0.200	0.830	0.016	0.015	0.240	0.100	0.070	0.020	0.002	0.001	-	-	-	-	0.373
079	3334	0.190	0.180	0.850	0.015	0.012	0.180	0.090	0.060	0.020	0.002	0.001	-	-	-	-	0.370
080	3373	0.210	0.190	0.830	0.019	0.013	0.190	0.130	0.110	0.020	0.002	0.001	-	-	-	-	0.399
081	3237	0.190	0.210	0.840	0.018	0.014	0.010	0.090	0.050	0.010	0.002	0.001	-	-	-	-	0.354
ITEM	EW HT. CD.	MECHANICAL PROPERTIES										HEAT TREATMENT		ADDITIONAL TEST/REMARKS			
Min		T. S. (KSI)	Y. S. (KSI)	EL. (%)	R of A (%)	Hardness (HB)(AVG)	Charpy Impact °F / 0 °C			MIN./AVG. / ( Jomle )			NORMALIZED		CONFORMS TO NACE MR0175/MR0103-2003		
Max		70.0	36.0	22.0	30.0	187	1	2	3	AVG.			860°C A.C.		STEEL MAKING PROCESS : ELECTRIC FURNACE		
077	3412	75.9	54.7	35.0	63.6	142	141										
078	3308	79.9	60.8	28.4	61.6	143	144										
079	3334	73.4	46.0	36.0	61.6	141	140										
080	3373	73.1	49.5	36.4	62.6	141	141										
081	3237	78.1	54.2	31.0	61.7	146	143										
WE HEREBY CERTIFY, THAT THE MATERIAL DESCRIBED ABOVE HAS BEEN TESTED AND COMPLIES WITH THE TERMS OF THE ORDER CONTRACT.																	
										C.C. Huang				Y.Y. Chang			
										Q.C.MANAGER				INSPECTOR			
										CHEN CHI HUANG				YUAN YAO CHANG			

EW-D0839 REV:1

**MILL TEST & INSPECTION CERTIFICATE**

ACCORDING TO EN 10204 : 2004 3.1  
 CUSTOMER : SEBOLD INTERNATIONAL CORP.  
 CERT. NO : 121507 L/C NO :  
 ORDER NO : 7005116 DATE : 05/16/2012  
 INVOICE NO : BW011001151A PAGE : 8 ORIGIN : TAIWAN



**柏維爾鋼鐵股份有限公司**  
 高雄市仁武區鳳林里仁心路 303 號  
**BOTWELL STEEL FITTINGS CO. LTD.**  
 NO.303, JEN-HSIN ROAD, JEN-WU DISTRICT  
 KAOSHIUNG CITY, TAIWAN R.O.C. (81460)  
 TEL: 866-7-371-0497, 371-1536, 372-0260  
 web site: http://www.botwell.com.tw e-mail: botwell@www.botwell.com.tw

An ISO 9001:2008 Registered Manufacturer



ITEM	RAW MATERIAL		DESCRIPTION	SPECIFICATION FOR		INSPECTION											
	HT. CD.	HEAT NO.		MATERIAL	FITTING		SURFACE	DIM.									
075	3604	322967	HEX PLUG 3/8" NPT	ASTM A105N -05													
076	3779	327003	HEX PLUG 1/2" NPT	ASME SA105N -A08	ASME B16.11 - 2010	GOOD											
077	3658	324350	HEX PLUG 3/4" NPT			GOOD											
077	3739	325858	HEX PLUG 3/4" NPT			GOOD											
078	3715	325854	HEX PLUG 1" NPT			GOOD											
ITEM	CHEMICAL COMPOSITION (%)											MATERIAL SUPPLIER					
HT. CD.	C	Si	Mn	P	S	Cu	Cr	Ni	Mo	V	Cb(Nb)		N	Al	Ti	Zr	CE
075	0.190	0.190	0.830	0.017	0.012	0.160	0.070	0.060	0.020	0.020	0.001	-	-	-	-	-	0.430
076	0.200	0.200	0.840	0.014	0.009	0.160	0.120	0.070	0.020	0.002	0.001	-	-	-	-	-	0.361
077	0.190	0.200	0.830	0.013	0.006	0.160	0.110	0.050	0.010	0.001	0.001	-	-	-	-	-	0.384
077	0.190	0.200	0.850	0.021	0.010	0.190	0.090	0.050	0.010	0.002	0.001	-	-	-	-	-	0.367
078	0.200	0.200	0.840	0.013	0.011	0.120	0.040	0.040	0.010	0.002	0.001	-	-	-	-	-	0.368
																	0.361
ITEM	MECHANICAL PROPERTIES											HEAT TREATMENT	ADDITIONAL TEST/REMARKS				
HT. CD.	T. S. (ksi)	Y. S. (ksi)	EL. (%)	R of A (%)	Hardness (HB)(AVG)	Charpy Impact F / 0 °C			MIN./AVG. / ( Joule )								
075	70.0	36.0	22.0	30.0	-	187	1	2	3	1	2	3	AVG.	NORMALIZED	CONFORMS TO NACE MR0175-09 / MR0103-10 STEEL MAKING PROCESS : ELECTRIC FURNACE CONFORMS TO NACE ISO15156-3 2009		
076	75.9	54.7	35.6	65.5	141	141	97	93	70	86.567	86.567	86.567	86.567			860°C A.C.	
077	80.0	55.0	26.0	65.0	147	145											
077	75.1	53.4	35.2	64.5	141	141											
077	76.0	49.0	35.0	66.0	145	146											
078	75.2	47.0	34.0	67.3	144	145											

WE HEREBY CERTIFY, THAT THE MATERIAL DESCRIBED ABOVE HAS BEEN TESTED AND COMPLIES WITH THE TERMS OF THE ORDER CONTRACT.

*C.C. Huang*  
 Q. C. MANAGER  
 CHEN CHI HUANG

*Y.Y. Chang*  
 INSPECTOR  
 YUAN YAO CHANG



S A 1066 12" x 1570 PIPE

PO# 24576

HT# 1333415

③

HENGYANG VALIN STEEL  
TUBE CO., LTD

MILL TEST CERTIFICATE

Add: 10 Dalixineun, Hengyang City, Hunan, P. R. China  
P.C.: 421001  
Tel. and Fax: +86 734 8873739  
E-mail: hstee@hysteeltube.com

(ACCORDING TO EN10204 3.1)

CUSTOMER	Marubeni-Itochu Steel Canada Inc		CERTIFICATE NO.	C201322196-1	
CONTRACT-ITEM NO.	2211001144-08	P.O.NO.	704137	DATE:	2013/6/21
PRODUCT	SEAMLESS PIPE		DELIVERY CONDITION	HR	
SPECIFICATION	SEE SPECIFICATION NOTE		HEAT TREATMENT		
GRADE	B		DIMENSIONS	12" x 0.375" x 40FT	
TOTAL BUNDLES:	8	TOTAL PIECES:	16	TOTAL LENGTH:	640.418 FT
				TOTAL WEIGHT:	14.400 MT

NO.	LOT No.	HEAT No.	BUNDLES	PIECES	LENGTH FT	WEIGHT MT	TENSILE TEST ASTM A370			
							TS(Psi)	YS(Psi)	EL(%)	R.A. (%)
1	C61009070	1333415	8	16	640.418	14.400	68150	49010	46.0	0.72

NO.	IMPACT TEST				NON METALLIC INCLUSION	GRAIN SIZE	HARDNESS TEST
	NOTCH TYPE/ORIENTATION	TEMPERATURE(C)	SIZE (mm)	AV. (J)			
	AK1 (T)	AV. (T)	% SHEAR AREA	LE			NACE MR0175/ISO 15156/ MR0103
				LE			HB
1	/	/	/	/			156.7////////

NOTES:  
W1--THEORETICAL WEIGHT  
W2--ACTUAL WEIGHT  
NR--NORMALIZING ROLLED  
AK1--ABSORB ENERGY FOR THE FIRST SET  
AK2--ABSORB ENERGY FOR THE SECOND SET  
SAMPLE ORIENTATION : L--LONGITUDINAL T--TRANSVERSE  
SAMPLE TYPE: S--STRIP C--CLUBBED F--FULL-SECTION  
Q&T--QUENCHING AND TEMPERING  
N--NORMALIZING T--TRANSVERSE HE--HOT EXPANDED  
A--ANNEALING HR--HOT ROLLED  
AV--AVERAGE M&T--NORMALIZING AND TEMPERING  
LE--SIDE EXPANSION

HENGYANG VALIN STEEL  
TUBE CO., LTD

MILL TEST CERTIFICATE

Add: 10 Dalixincun, Hengyang City, Hunan, P. R. China  
P.C.: 421001  
Tel and Fax: +86 734 8873739  
E-mail: hysicc@hysteel.tubc.com

(ACCORDING TO EN10204.3.1)

CUSTOMER	Marubeni-Itochu Steel Canada Inc			CERTIFICATE NO.	C201322196-1																																																																																							
CONTRACT-ITEM NO.	2211001144-08	P.O.NO.	704137	DELIVERY CONDITION	2013/6/21																																																																																							
PRODUCT	SEAMLESS PIPE			HEAT TREATMENT	HR																																																																																							
SPECIFICATION	SEE SPECIFICATION NOTE			DIMENSIONS	12"x0.375"x40FT																																																																																							
GRADE	B			TOTAL LENGTH:	640.418																																																																																							
TOTAL BUNDLES:	8			TOTAL PIECES:	16																																																																																							
HEAT No.				TOTAL WEIGHT:	14.400 MT																																																																																							
LOT No.				CHEMICAL COMPOSITION (%)																																																																																								
	Type	C	Si	Mn	Cr	Mo	W	Cu	Ni	P	Al	Sn	As	Pb	Sb	Nb	Ti	Zr	N	Bi	S	V	B	Ca	CE	SUM1	SUM2	SUM3	R1	R2	R3																																																													
		*100										*1000										*100000		*100		*1000																																																																		
1	H	14	30	98	84	12		105	39	19													30	31	3	33	243	5.1	7.1		7.0																																																													
	P	14	33	94	84	13		106	37	18													28	47	2	33	245	7.7	9.7		6.7																																																													
	P	14	33	94	85	11		106	38	18													29	50	1	33	245	7	9		6.7																																																													
	H																																																																																											
	P																																																																																											
	P																																																																																											
	H																																																																																											
	P																																																																																											
	P																																																																																											
POSITION		PIPE BODY													NON-DESTRUCTIVE TEST													PIPE END													END SURFACE(GROOVE)													BE																																						
NDT Type(Level)		EMI													MPI																										ACCEPTABLE													ACCEPTABLE																																						
LAMINAR		ACCEPTABLE													ACCEPTABLE													ACCEPTABLE													N/A													ACCEPTABLE													ACCEPTABLE																									
RESIDUAL MAGNETISM		ACCEPTABLE													ACCEPTABLE													ACCEPTABLE													N/A													ACCEPTABLE													ACCEPTABLE																									
UT THICKNESS MEASUREMENT		Min(psi/s)													1250/6													N/A													N/A													ACCEPTABLE													ACCEPTABLE																									
HYDROSTATIC TEST																																																																																												
NOTES:		H-HEAT ANALYSIS													P--PRODUCT ANALYSIS													CE--EQUIVALENT CARBON													R--RATIO													R1=Ca /S													R2=Al /N													R3=Mn /C												
		CE11W=C+Mn/6+(Cr+Mo+V)/5+(Cu+Nt)/15													CEPCM=C+Si/20+(Mn+Cr+Cu)/20+Ni/60+Mo/15+V/10+S+Be													SUM2=Nb+V													SUM3=Nb+V+Ti																																																			
		SUM1=C+Cr+Mo+Nt+V													L4/L3/L2--ACCEPT LEVEL													L4/L3/L2--NOTCH DEPTH IS 12.5%/10%/5% THE SPECIFIED WALL THICKNESS.																																																																

HENGYANG VALIN STEEL  
TUBE CO., LTD

MILL TEST CERTIFICATE

Add: 10 Dalixincun, Hengyang  
City, Hunan, P.R. China P.C.: 421001  
Tel and Fax: +86 734 8873739  
E-mail: hstee@hysteeltube.com

(ACCORDING TO EN10204 3.1)

CUSTOMER	Marubeni-Itochu Steel Canada Inc			CERTIFICATE NO.	C201322196-1
CONTRACT-ITEM NO.	2211001144- 08	P. O. NO.	704137	DATE:	2013/6/21
PRODUCT	SEAMLESS PIPE			DELIVERY CONDITION	HR
SPECIFICATION	SEE SPECIFICATION NOTE			HEAT TREATMENT	
GRADE	B			DIMENSIONS	12' x 0.375' x .40FT
TOTAL BUNDLES: \$		TOTAL PIECES: 16	TOTAL LENGTH: 640.418	FT	TOTAL WEIGHT: 14.400
					MT

REMARK: 1.ORIGIN:MADE IN CHINA.2.ALL ELEMENTS TO BE LISTED;

API 5L 44TH EDITION B ASTM A106 B-2010/ASME SA106B-2010/NACE MR0175-2003/  
ISO 15156/MR0103(hardness only)

SPECIFICATION  
NOTE

We hereby certify that material herein described has been manufactured in accordance with the standards and specifications required in your order and satisfies the corresponding requirements.

This certificate is issued by a computerized system and it is valid with electronic signature. In case the owner of the certificate would release a copy of it, he must attest its conformity to the original one taking upon himself the responsibility for any unlawful or not allowed use.

Any alteration and/or falsification will be subject to the law.

If you need to assure the authenticity of this certificate, please do not hesitate to contact Hengyang Valin Steel Tube CO.,LTD, E-mail: hstee@hysteeltube.com

CUSTOMER THIRD PARTY

Quality Manager:



Certificate-maker: 刘年亚

SA106 2" S/XH PIPE

PO# 24205

Address: 10 Dalixineun, Hengyang City, Hunan, P. R. China  
 P.C.: 421001  
 Tel and Fax: +86 734 8873739  
 E-mail: hsiecd@hysteeltube.com

MILL TEST CERTIFICATE

HENGYANG YALIN STEEL  
 TUBE CO., LTD

(ACCORDING TO EN10204 3.1B)

CUSTOMER	Manubeni-Hoehlt Steel Canada Inc			CERTIFICATE NO.	C201216284-1							
CONTRACT-ITEM NO.	2111000120-01	P.O.NO.	SEAMLESS PIPE			DELIVERY CONDITION	HR					
PRODUCT												
SPECIFICATION	SEE SPECIFICATION NOTE											
GRADE	B											
TOTAL BUNDLES:	14	TOTAL PIECES:	506	TOTAL LENGTH:	10126.700 FT	TOTAL WEIGHT:	23.085 MT					
NO.	LOT No.	HEAT No.	BUNDLES	PIECES	LENGTH FT	WEIGHT MT	TENSILE TEST ASTM A370			COLD BENDING TEST		
							TS(Pst)	YS(Pst)	RL0.5		EL(%)	R.A. (%)
1	924301205	1222818S	14	506	10126.700	23.085	70180	49155	35.5		0.70	ACCEPTABLE
IMPACT TEST												
NO.	NOTCH TYPE/ORIENTATION/TEMPERATURE/SIZE (mm):		NON METALLIC INCLUSION		GRAIN SIZE		HARDNESS TEST					
	AK1 (J)	Av. (J)	% SHEAR AREA	LE	AK2 (J)	Av. (J)	% SHEAR AREA	LE	NACE MR0175/ISO 15156/MR0103 HB			
1									14200000			

NOTES:  
 W1-THEORETICAL WEIGHT  
 W2-ACTUAL WEIGHT  
 NR-NORMALIZING ROLLED  
 AK1-ABSORB ENERGY FOR THE FIRST SET  
 AK2-ABSORB ENERGY FOR THE SECOND SET  
 Q&T-QUENCHING AND TEMPERING  
 SAMPLE TYPE: S-STRIP C-CLUBBED F-FULL-SECTION  
 N-NORMALIZING T-TRANSVERSE  
 A-ANNEALING  
 Av-AVERAGE  
 LE-SIDE EXPANSION  
 NR-NORMALIZING AND TEMPERING  
 HR-ROT ROLLED  
 HE-ROT EXPANDED



THE ORIGINAL

HENGYANG VALIN STEEL  
TUBE CO., LTD

# MILL TEST CERTIFICATE

Address: 10 Daxinincun, Hengyang City, Hunan, P.R. China  
P.C.: 421001  
Tel and Fax: +86 734 8873739  
E-mail: hstee@hysteel.tbba.com

(ACCORDING TO EN10204 3.1B)

CUSTOMER		Manitoba Hochu Steel Canada Inc																CERTIFICATE NO.			2012-5-15			DATE			2012-5-15			PAGE			2/3								
CONTRACT ITEM NO.		2111000120-01																P.O. NO.			SEAMLESS PIPE			DELIVERY CONDITION			HR														
SPECIFICATION		SEE SPECIFICATION NOTE																HEAT TREATMENT			TOTAL LENGTH			1026.700			DIMENSIONS			2" * 0.218" * 20FT											
GRADE		B																TOTAL PIECES			306			TOTAL LENGTH			1026.700			FT			TOTAL WEIGHT			23.085			MT		
NO	HEAT No.	LOT No.	Type	CHEMICAL COMPOSITION (%)																*1000	*100	*10000	*1000	*1000	R1	R2	R3														
				C	Si	Mn	Cr	Mo	W	Cu	Ni	P	Al	Sn	As	Pb	Sb	Nb	Ti									Zr	N	Bi	S	Y	B	Ca	CePr	Other	SUM1	SUM2	SUM3	RI	R2
1	1222818S		P	16	26	103	8	2		6	3	14		2	3			20	50	1		36	195	7	10		6.4														
	924301205		P	15	24	101	7	1		5	2	12		1	2			20	43	2		34	154	5.3	7.3		6.7														
	924301205		P	15	23	101	7	1		5	2	12		1	2			20	43	2		34	154	5.3	7.3		6.7														
			H																																						
			P																																						
			P																																						
			H																																						
			P																																						
			P																																						
POSITION		PIPE BODY			PIPE END			END SURFACE (GROOVE)			BEVELLING		ACCEPTABLE																												
NDT Type (Level)		ET			MPI			N/A			VISUAL & DIMENSION		ACCEPTABLE																												
LAMINAR		ACCEPTABLE			ACCEPTABLE			N/A			COATING		ACCEPTABLE																												
TEST RESULT		ACCEPTABLE			ACCEPTABLE			N/A			ACCEPTABLE																														
RESIDUAL MAGNETISM		2500/6			ACCEPTABLE			N/A			ACCEPTABLE		ACCEPTABLE																												
UT THICKNESS MEASUREMENT (50%)		MIR(PSI/S)			2500/6			ACCEPTABLE			R3=Mn/C		ACCEPTABLE																												
HYDROSTATIC TEST		MIR(PSI/S)			2500/6			ACCEPTABLE			R2=N/A/N		ACCEPTABLE																												
NOTES:		E1-HEAT ANALYSIS			P-PRODUCT ANALYSIS			CE-EQUIVALENT CARBON			R1=Ca/S																														
		CE1W=C-Mn/6+(Cr+Mo-N)/5+(Cu+Ni)/15			CEPCW=C-Si/50+(Mn+Cr-Cu)/20+(Ni+Mo)/15+V/10+S/8			R-RATIO			R3=Mn/C																														
		SUM1=C+Cu+Mo+Ni+V			SUM2=Nb+V			SUM3=Nb+V+Ti			R2=N/A/N																														
		LAI/JIL2--ACCEPT LEVEL LA/JIL2 NOTCH DEPTH IS 12.5% / 10% / 5% THE SPECIFIED WALL THICKNESS.																																							



ORIGINAL

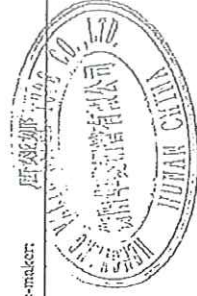
HENGYANG VALIN STEEL  
TUBE CO., LTD

MILL TEST CERTIFICATE

Add: 10 Dalixincun, Hengyang  
City, Hunan, P.R. China P. C.: 421001  
Tel and Fax: +86 734 8873739  
E-mail: hsiendhysteeltube.com

CUSTOMER		Mianben-Itochu Steel Canada Inc		CERTIFICATE NO.		C201216284-1	
CONTRACT-ITEM NO.	2111000120- 01	P. O. NO.	SEAMLESS PIPE	DELIVERY CONDITION	HR	DATE:	2012-5-15
PRODUCT	SEE SPECIFICATION NOTE	HEAT TREATMENT					
SPECIFICATION							
GRADE							
TOTAL BUNDLES: 14	TOTAL PIECES: 506	DIMENSIONS	2"0.218"20FT		FT	TOTAL WEIGHT:	23.085 MT
		TOTAL LENGTH:	10126.700				
		REMARK:					

SPECIFICATION NOTE	API 5L 44TH EDITION B ASTM A 106 B-2010/ASME SA 106B-2010/NACE MR-0175- 2003/ISO 15156/MR0103(hardness only)	
We hereby certify that material herein described has been manufactured in accordance with the standards and specifications required in your order and satisfies the corresponding requirements.		
This certificate is issued by a computerized system and it is valid with electronic signature. On the original certificate the trade-mark JOINTIME light-green coloured at the bottom of the page is stamped. In case the owner of the certificate would release a copy of it, he must attest its conformity to the original one taking upon himself the responsibility for any unlawful or not allowed use.		
Any alteration and/or falsification will be subject to the law.		
If you need to assure the authenticity of this certificate, please do not hesitate to contact Hengyang Valin Steel Tube CO., LTD. E-mail: hsiendhysteeltube.com		
CUSTOMER THIRD PARTY		
Quality Manager:	朱景凌	
Certificate-maker:	HUNAN VALIN STEEL TUBE CO., LTD.	



ORIGINAL





YANTAI LUBAO STEEL PIPE CO., LTD.

MILL TEST CERTIFICATE

NO. 185 XINGFU MIDDLE ROAD, YANTAI, CHINA  
 TEL: 0086 535-6843946/6854750 FAX: (0535) 6842245  
 HTTP://WWW.LUBAOSTEEL.TUBE.COM

(EN10204 3.1)

PURCHASER	TRANS AM PIPING PRODUCTS LTD.		DESCRIPTION OF GOODS	PIPE	
DIMENSION STANDARD	ASME B36.10	CUSTOMER'S NO.	L00109	CERTIFICATE NO.	BGTYG101190000600
MATERIAL SPECIFICATION	ASTM A106-B-2006, ASME SA106-B-2007, API 5L B-2007		DATE OF DELIVERY	G1C6100707	
	CSA Z245.1-2007 Gr. 241 Cat I		P.O. NO.	20110119	
	NACE MR0175-2003/ISO 15156		STAMP OF MILL INSPECTOR		

O.D.	114.3mm	4 STD	W.T.	6.02mm	Length	11-11.8M	Total Length	As-Rolled	Total Bundles	Order Quantity	Hot Finished Seamless					
	Total Pieces															
No Heat No.	Chemical Composition															
	C	Si	Mn	P	S	Cu	Ni	Cr	V	Mo	Ti	B	Nb	CE		
MIN	0.1	0.29	0	0	0	0	0	0	0	0	0	0	0	0		
MAX	0.22	9.9	1.06	0.035	0.035	0.40	0.40	0.40	0.08	0.15	0.01	0.001	0.01	0.27		
10708253	H	0.19	0.26	0.44	0.016	0.013	0.01	0.02	0	0	0	0	0	0		
E.T.	E.M.I.		U.T.		M.P.I.		Visual & Dimensions		Coating		Drift Test		Hydrostatic Pressure		Duration of Time	
	GOOD		GOOD		GOOD		Good		SSCC		Macrostructure		15.50MPa		5s	
Expansion	Ring Expansion		Ring Tensile		Flattening		Bending		Flanging		Macrostructure		Heat Treatment			
NOTES	2* Chemical Composition H:Heat (Ladle) Analysis 3* P= Pipe Body, 4* I=Longitudinal 5* 2=Script X 20mm; G.L.=Gauge Length L1=5.65SQRT (FO)															
Remark	WE HERE CERTIFY THAT THE MATERIAL HEREIN DESCRIBED HAS BEEN MANUFACTURED, SAMPLED, TESTED AND INSPECTED IN ACCORDANCE WITH THE REQUIREMENTS OF ABOVE SPECIFICATIONS AND PURCHASE ORDER, AND MET THE REQUIREMENTS.															
SURVEYOR	 CHIEF OF QUALITY CONTROL DEPT.															



SA106B 20" STD PIPE  
Heat BSM-1086

PO# 24132

Bri-Steel Manufacturing Inc.  
2125-64 Avenue, Edmonton, AB Canada T6P 1Z4  
Tel: 001 (780) 469-6603  
Fax: 001 (780) 459-6986  
www.brichemsteel.com

### Mill Test Certificate

Product: Seamless Carbon Steel Pipe      Product Heat Number: BSM-1086      Product Size: NPS 20 STD      Production Date: July 17, 2013

Production Method: Hot Expansion      Product Heat Treatment: As-rolled

Product Standards: ASME B36.10-2004, ASTM/ASME A/SA106-2011 Grade B/C NDE, A/SA53-2012 Grade B Type S, NACE MR0175-2009, MR0103-2010

Product Markings: BRI-STEEL MFG <API> SL-0898 API 5L GR B PSL1 ASTM/ASME A/SA106 GR B/C A/SA53 GR B NPS 20 STD 0.375 inchWT HEAT BSM-1086 (PIPE # LENGTH MASS) 78.6lb/ft NDE 900 PSI SMLS NACE MR0175 2013/07 MADE IN CANADA.

Product Details				Non-Destructive Testing											
Heat	Test Type	Product Size	Pieces	Mass lb/ft	Length	DRL	Geiger $\mu R/hr$	Res. Mag. Gauss	Visual Insp.	OD	UT WT	UT ASTM E213	ET	HydroTest	End Condition
BSM-1086	Heat	NPS 20 STD 0.375 in. WT	33	78.60			<S	<20	Pass	Pass	Pass	Pass	Pass	Pass	32.5° Bevel

Chemical Analysis (wt%)																
Heat	Steelmaking Method	Analysis	C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	CE (TIV)	CE (CSA)
BSM-1086	Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed	Heat	0.19	0.92	0.010	0.009	0.25	0.04	0.07	0.01	0.04	-	-	-	-	-
		Product	0.21	0.90	0.012	0.011	0.25	0.04	0.07	0.01	0.03	0.004	0.001	0.001	0.0002	0.38

Mechanical Properties									
Heat	Test Type	Microstructure	Hardness HRBW	Flattening Test	Tension Test	Yield (R0.5)	Tensile (Rm)	Y/T (R0.5/Rm)	Elongation (A)
BSM-1086	Heat	Ferrite & Pearlite	74	Pass	Longitudinal; 38.1mm x WT	44,400	71,000	0.63	42

Heat	Test Standard	Impact Test Sample Details	Temp °C	Impact Energy			% Shear			Lateral Expansion				
				J	J	J	%	%	%	mm	mm	mm		
BSM-1086	-	-	-	-	-	-	-	-	-	-	-	-	-	-

**Additional Details:**

- ✓ We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing Inc. in accordance with API SL-44th Ed., ASTM/ASME A/SA106-2011, A/SA53-2012, and the purchase order requirements, and that the results meet the corresponding requirements.
- ✓ This pipe product meets the sour service requirements of NACE MR0175/ISO 15156-2:2009 Annex A2 for Region 3 Sour Service, and NACE MR0103-2010 Section 2.1.
- ✓ No weld repairs have been performed on this product.
- ✓ This product has not come into contact with mercury during the Bri-Steel Manufacturing processes.
- ✓ This certificate represents a quality control system that is compliant with EN 10204:2004 Type 3.1.

Mill Test Certificate approved by:

2013 JUL 24

Paul Sowden, T.T.  
Assistant QA Manager



PO# 24106  
Aug 13

HT # 58396  
PL # 042  
W1174

3/8" SA 516 70N  
Rode

**RUIKKI**

VASTAANOTTOTODISTUS INSPECTION CERTIFICATE

EIN 10 204-3.1 (2004)

**Client / Purchaser:**  
OLBERT METAL SALES LIMITED  
LST 238 MISSISSAUGA CANADA  
Tilauksen / Order No. 1811

**Manufacturer / Delivery Type:**  
OLBERT METAL SALES LIMITED  
LST 238 MISSISSAUGA CANADA  
Tilauksen / Order Confirmation 27466  
Edenborg

**Product / Description:**  
HEAVY PLATES  
SA516 GR 70 MTLTY ASME SA516-11A ASTM A516-10  
PRESS. VESSEL STEEL ASME CODE SECTION II DIV 1 SA20

**Dimensions:**  
Tolerance Width: ±1.0 - 3.0 LENGTH: ±20.5 - 3.0  
Tolerance Spec. RAU-OY, 142 REV. 5/MN/C NOT REPORTED IN THE CERT.; FLATNESS 6MM/M; THIC. TOL. ACC. TO SA20

**Inspection Details:**  
Tarkastuspaikka / Location: Edenborg  
Tarkastusajankohta / Date: 31.10.2012  
Tarkastusajon / Order No.: 27466  
Tarkastusajon / Order Confirmation: 27466  
Tarkastusajon / Order Confirmation: 27466

**Manufacturer's Stamp:**  
Tarkastusajon / Order No.: 27466  
Tarkastusajon / Order Confirmation: 27466  
Tarkastusajon / Order Confirmation: 27466

QTY	Width	Length	Weight	Material	Grade	SP No.	UT
2	5560	58396	033	033	034	034	034
2	5560	58396	035	035	035	035	035
2	5560	58396	041	041	041	041	041
1	2780	58396	042	042	042	042	042
2	5560	58396	043	043	043	043	043

**Inspection Results:**  
Tolerances within ±1.0 - 3.0 LENGTH ±20.5 - 3.0  
Tolerance Spec. RAU-OY, 142 REV. 5/MN/C NOT REPORTED IN THE CERT.; FLATNESS 6MM/M; THIC. TOL. ACC. TO SA20

**Surface Condition:**  
Surface Condition EN 10 103-2:2005 CLASS B3

**Inspection Results:**  
Tolerances within ±1.0 - 3.0 LENGTH ±20.5 - 3.0  
Tolerance Spec. RAU-OY, 142 REV. 5/MN/C NOT REPORTED IN THE CERT.; FLATNESS 6MM/M; THIC. TOL. ACC. TO SA20

**Surface Condition:**  
Surface Condition EN 10 103-2:2005 CLASS B3

**Inspection Results:**  
Tolerances within ±1.0 - 3.0 LENGTH ±20.5 - 3.0  
Tolerance Spec. RAU-OY, 142 REV. 5/MN/C NOT REPORTED IN THE CERT.; FLATNESS 6MM/M; THIC. TOL. ACC. TO SA20

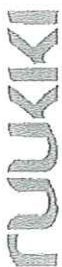
**Surface Condition:**  
Surface Condition EN 10 103-2:2005 CLASS B3

**Inspection Results:**  
Tolerances within ±1.0 - 3.0 LENGTH ±20.5 - 3.0  
Tolerance Spec. RAU-OY, 142 REV. 5/MN/C NOT REPORTED IN THE CERT.; FLATNESS 6MM/M; THIC. TOL. ACC. TO SA20

**Surface Condition:**  
Surface Condition EN 10 103-2:2005 CLASS B3

**Final Remarks:**  
The certificate only remains on the material described above and complies with the terms of the order confirmation.  
No other party shall be liable for the material described above.

**Inspector:** JAAKKO JUUSO  
Yhteistyö / Cooperation: RUIKKI METALS OY  
Yhteistyö / Cooperation: RUIKKI METALS OY



AINESTODISTUS TEST REPORT

7/13  
A. 27466 -001 A  
30.10.2012

EN 10 204-3.1 (2004)

Unitas Oy  
OLBERT METAL SALES LIMITED  
SUITE 305  
1811

Yhteystiedot  
Olbert Metal Sales Limited  
Suomenmetsäntie 305  
01811

Yhteystiedot  
Olbert Metal Sales Limited  
Suomenmetsäntie 305  
01811

Unitas Oy  
OLBERT METAL SALES LIMITED  
SUITE 305  
1811

Yhteystiedot  
Olbert Metal Sales Limited  
Suomenmetsäntie 305  
01811

SAS16 GR 70 MTLTY

Jäykkyyttä ja heikkoutta  
Cryogen steel, continuous casting  
Fully killed, Fine grain practice

Laatuvaatimukset  
Press Steel Steel ASME CODE SEC II ED 2011A SA20

Yhteystiedot  
Olbert Metal Sales Limited  
Suomenmetsäntie 305  
01811

Table with columns: Pos. / Item, Suunnitelma / Desig, Valokoe / Test, Tulokset / Results, etc. Includes data for various test positions and results.

Table with columns: Pos. / Item, Suunnitelma / Desig, Valokoe / Test, Tulokset / Results, etc. Includes data for various test positions and results.

Testaus ja tarkastus  
Raaho Steel Works  
JAAKKO JUUSO  
Yhteystiedot / Contact info: Puhelin / Telephone: 035 6511, Faksi / Fax: 035 23 2730, Sähköposti / Email: j.uuso@raaho.fi



ANALYYSITODISTUS ANALYSIS CERTIFICATE  
 ANALYSEBESCHEINIGUNG COMPOSITIO CHIMIQUE CERTIFICAT  
 CEPTIOMKAT ANALYISA

12/13  
 A 27456 -001 A  
 30.10.2012

31.10.2012  
 31.10.2012

Material No No de condition No Pöytäkirja	Yhteisö Yhtiö No Schmelznr Nr No de condition No Pöytäkirja	Pöytäkirja Pöytäkirja No No	C	SI	Mn	P	S	AL	Ni	Cu	Cr	Ni	Mo	N	SN	B	LIV
50250	001	30	206	32	1.10	0.12	0.01	0.35	0.01	0.09	0.05	0.10	0.04	0.03	0.03	0.02	0.0002
50306	001	30	197	32	1.09	0.06	0.01	0.33	0.01	0.08	0.04	0.10	0.04	0.03	0.04	0.03	0.0003
50306	002	30	207	32	1.09	0.08	0.01	0.33	0.01	0.08	0.04	0.10	0.04	0.03	0.04	0.03	0.0003
50303	003	30	100	33	1.11	0.08	0.01	0.32	0.01	0.10	0.04	0.13	0.04	0.04	0.04	0.04	0.0004
50250	004	30	186	32	1.10	0.12	0.01	0.35	0.01	0.09	0.05	0.10	0.04	0.03	0.03	0.02	0.0002
50249	005	30	188	32	1.09	0.12	0.02	0.33	0.01	0.08	0.05	0.09	0.04	0.03	0.03	0.03	0.0002
57251	006	40	199	35	1.09	0.10	0.01	0.40	0.15	0.08	0.04	0.11	0.05	0.04	0.05	0.03	0.0002
50475	007	42	209	37	1.14	0.10	0.01	0.41	0.15	0.08	0.04	0.14	0.05	0.04	0.04	0.03	0.0003

REQ=C-M07/6+ (CR-M0+V) / 5+ (NI+CT) / 15

Racine Steel Works

Testing and Inspection  
 Essais et Contrôles

Steel manufactured and supplied by Rautaruukki is free from radiation.  
 Teräksessä ei ole radioaktiivista säteilyä.

*Jaakko Juuso*

JAAKKO JUUSO

Authorized Inspection Representative / Yhteistyökumppani / Inspecteur

Yhtiön nimi / Company Name: RUKKI METALS OY  
 Kirjoittaja / Registered Office: HELSINKI

Phone Telephone: 035 9211  
 Puhelin Telephone: 035 20 5811

Telex: 030 302 2730  
 -355 20 302 2730

Yhteisö / Company ID: 2300410-7

44W/SA36 1/2" plate

WTT# 1025 1769

Pö# 17568

STM-0053

P.O. 20045



# Test Certificate

Form TCI: Revision 1: Date 31 Oct 2000

EVRAZ INC. NA

3250 130th Street, Surrey, BC, V3W 8J9

Customer: VARSTEEL LTD. 330-220 4TH STREET LEATHERBRIDGE AB T1J4J7	Customer P.O. No.: CY-941618	Mill Order No.: 41-241713-01	Shipping Manifest: ST047507
Product Description: CSA G40.21(2004)44W/300W / ASTM A36(05) A709(01A)36/ASME SA36(01ED)	Ship Date: 19 Aug 11	Cert No: 011129210	(Page 1 of 1)
Size: 0.500 X 60.00 X 1.20.0 (LIN)	Cert Date: 19 Aug 11		

Heat Id	Tensiles				Charpy Impact Tests				BDWTT					
	Piece Id	Piece Dimensions	YS (PSI)	UTS (PSI)	%RA	Elong %	Average Hardness	Abs. Energy (FTLB)		% Shear	1st Dir (mm)	2nd Dir (mm)	3rd Dir (mm)	Temp
6251769	1H4F2828	0.500 X 60.00 (CUT)	L51000	71000	33	33	T							
6251769	1H4F2881	0.375 X 60.00 (CUT)	C52000	72000	32	32	T							

Heat Id	Chemical Analysis												ORGN	
	C	Mn	P	S	Si	Tot Al	Cu	Ni	Mo	Cr	V	Ti		B
6251769	.14	1.24	.019	.013	.26	.025	.02	.02	.00	.001	.003	.016	.0000	.0040

\* 6251769 MATERIAL MARKED WITH AN ASTERISK IS PRODUCED FROM COIL 1H4F2825 PCES: 2, WGT: 2042

Cust Part #:	WE HEREBY CERTIFY THAT THIS MATERIAL WAS TESTED IN ACCORDANCE WITH THE APPROPRIATE SPECIFICATION	Checked By: Greg Balsdon
--------------	--	--------------------------

Customer Name

PETROFIELD INDUSTRIES INC.

Customer PO#

20687

Shipper No

328120

Heat Number

8351L

ESSAR Steel Algomaa Inc. 105 West Street, Sault Ste. Marie, Ontario Canada P6A 7B4

CUSTOMER PURCHASE ORDER NUMBER CY-942081	ENTRY DATE 2011/08/24	CREATE DATE 2011/10/01	DAILY NUMBER 248770	SHIPPER'S NO. -	CARRIER CP	WILL ORDER 10528
CHARGE TO CUSTOMER NAME AND ADDRESS						
VARSTEEL LTD #330 220 - 4TH STREET SOUTH LETHBRIDGE, ALBERTA T1J 4J7						
SHP TO CUSTOMER NAME AND ADDRESS						
VARSTEEL LTD 10220 52 STREET SE CALGARY, ALBERTA T1J 4J7						
CUSTOMER SPECIFICATION HR MULTIPLE CERTIFIED PLATE - ESLA - CSA G40.21 44W/ASTM A36 (04) (08)						

Acid 20687 -317407

MILL TEST REPORTS

ESSAR STEEL, ALGOMAA INC. HEREBY CERTIFIES THAT THE MATERIAL HEREIN DESCRIBED WAS MADE AND TESTED IN ACCORDANCE WITH THE RULES OF THE SPECIFICATION SHOWN. ALL RESULTS ARE RETAINED IN ACCORDANCE WITH THE COMPANY'S STANDARD RECORD KEEPING PRACTICES.

K. UGHADPAGA  
MANAGER METALLURGICAL SERVICES

THIS MILL TEST REPORT MAY NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF ESSAR STEEL ALGOMAA INC. IF YOU RECEIVE THIS DOCUMENT AND ARE NOT THE INTENDED RECEIVER, PLEASE CALL (705)945-2626 COLLECT FOR INSTRUCTIONS ON METHOD OF DISPOSAL OF DOCUMENT.

SUPPLEMENTARY INSTRUCTIONS  
TEST CERT 1: RECEIVING@VARSTEEL.CA TEST CERT 2: MARK.FILATOFF@VARSTEEL.CA PLATE TEST COUPON:

TEST REPORTS REQUIRED  
RESALE  
2000198931 PF  
2011/11/02 06:35

MEETS EN 10204:2004 TYPE 3.1 ISO QUALITY AND ENVIRONMENTAL CERTIFICATES AVAILABLE AT WWW.ESSARSTEELALGOMAA.COM

ALL HEATS FULLY KILLED HEATS INDICATED WITH (\*) FINE GRAINED HEATS INDICATED WITH (+) MADE IN CANADA WITH DOMESTIC AND NORTH AMERICAN MATERIALS

CUSTOMER ITEM 00007 OUR ITEM 006 DIMENSIONS .750 X 60 X 120 " SHIP P E D \* \* \* \* \*

PLATE NUMBER 36425 41430	HEAT-MS PIECES 8351L-53 9068L-54	NO. WEIGHT 12 4	HEAT-MS PIECES 8351L-58 12	NO. WEIGHT 12 18376
--------------------------------	--	-----------------------	----------------------------------	---------------------------

TENSILE TESTS: \* SAMPLE \* GAUGE COND METE DIR \* TEST \* \* YIELD TENSILE \* ELONG

SRCE	GAUGE	COND	METE	DIR	TEST	YIELD	TENSILE	% ELONG
166"	.7500	AR	.2	T	51.4	72.0	25(8")	
166"	.7500	AR	.2	T	51.0	70.0	31(8")	
166"	.7500	AR	.2	T	51.3	71.0	27(8")	

LAB AVG ALG LAB AVG ALG

\*\*WARNING\*\* THE TEST RESULTS AND VALUES REPORTED HEREIN INDICATE ONLY THAT (1) THE PARTICULAR STEEL FOR WHICH THIS CERTIFICATE IS ISSUED MEETS THE MINIMUM SPECIFIED YIELD STRENGTH AND (2) THE CHEMICAL ANALYSIS AND PHYSICAL PROPERTIES OF SUCH STEEL ARE IN CONFORMANCE WITH THE REQUIREMENTS OF THE SPECIFICATION INDICATED. THE RESULTS OR VALUES REPORTED HEREIN CAN NOT BE USED TO QUALIFY THE STEEL FOR ANY SPECIFICATION OTHER THAN THE ONE INDICATED AND CAN NOT BE RELIED UPON FOR ANY PURPOSE (INCLUDING DESIGN OR CALCULATIONS) AS REPRESENTING THE ACTUAL STRENGTH OF SUCH STEEL.

Customer Name

Customer PO#

Shipper No

Heat Number

PETROFIELD INDUSTRIES INC.

20687

328120

8351L

**ESSAR Steel Alberta Inc.**  
 105 West Street, Sault Ste. Marie, Ontario Canada P6A 7B4  
 CUSTOMER PURCHASE ORDER NUMBER: CY-942081  
 ENTRY DATE: 2011/08/24  
 CREATE DATE: 2011/10/01  
 TALLY NUMBER: 248770  
 SHIPPER'S NO.: -  
 CARRIER: CP  
 MILL ORDER: 10528  
 CHARGE TO CUSTOMER NAME AND ADDRESS: -317407

VARSTEEL LTD  
 #330-220-4TH STREET SOUTH  
 LEITHBRIDGE, ALBERTA  
 T1J 4J7  
 SHIP TO CUSTOMER NAME AND ADDRESS: VARSTEEL LTD  
 10220 52 STREET SE  
 CALGARY, ALBERTA  
 T1J 4J7

CUSTOMER SPECIFICATION  
 HR MULTIPLE CERTIFIED PLATE - HSLA - CSA G40.21 44W/ASTM A36 (04) (08)

SUPPLEMENTARY INSTRUCTIONS  
 K. UGHADEPAGA  
 MANAGER METALLURGICAL SERVICES  
 THIS MILL TEST REPORT MAY NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF ESSAR STEEL ALBERTA INC. IF YOU RECEIVE THIS DOCUMENT AND ARE NOT THE INTENDED RECEIVER, PLEASE CALL (705)945-2624 COLLECT FOR INSTRUCTIONS ON METHOD OF DISPOSAL OF DOCUMENT.

TEST CERT 1: RECEIVING@VARSTEEL.CA TEST CERT 2: MARK.FILATOFF@VARSTEEL.CA PLATE TEST COUPON:  
 2000198931 PF  
 2011/11/02 06:35

HEAT	(WT %)	C	MN	P	S	SI	CR	NI	CU	MO	AL	CB	V	B	DO
8351L*+		0.15	1.16	0.009	0.006	0.23	0.02	0.02	0.03	0.01	0.030	0.000	0.040		0.36
9068L*+		0.002	0.002	0.010	0.008	0.22	0.02	0.01	0.03	0.00	0.028	0.000	0.038		0.35

NEP TR TEST REPORTS REQUIRED  
 CUST USE RESALE

\*\*WARNING\*\*  
 THE TEST RESULTS AND VALUES REPORTED HEREIN INDICATE ONLY THAT (1) THE PARTICULAR STEEL FOR WHICH THIS CERTIFICATE IS ISSUED MEETS THE MINIMUM SPECIFIED YIELD STRENGTH AND (2) THE CHEMICAL ANALYSIS AND PHYSICAL PROPERTIES OF SUCH STEEL ARE IN CONFORMANCE WITH THE REQUIREMENTS OF THE SPECIFICATION INDICATED. THE RESULTS OR VALUES REPORTED HEREIN CAN NOT BE USED TO QUALIFY THE STEEL FOR ANY SPECIFICATION OTHER THAN THE ONE INDICATED AND CAN NOT BE RELIED UPON FOR ANY PURPOSE (INCLUDING DESIGN OR CALCULATIONS) AS REPRESENTING THE ACTUAL STRENGTH OF SUCH STEEL.

SS316 3/8" Plate

Lot # E39571

Pa # 24669  
C05/665



# 新日鐵住金ステンレス株式会社

## Nippon Steel & Sumikin Stainless Steel Corporation

### 鋼材検査証明書

#### INSPECTION CERTIFICATE

需要者: ASA ALLOYS INC.  
Customer: ASA ALLOYS INC.

社名: 新日鐵住金(株) 東京都千代田区大田町... 丁目中 第1号  
Head Office: 2-8-1 Chomei-cho, Ohta-ku, Tokyo 106-8601 Japan  
八幡製鉄所: 〒803-0053 北九州府八幡市北九州町1-1-10 東一  
Yawata Works: 2109-1, Aizubaru, Oosaka Prefecture, Yawatabashi-ku, Osaka  
支店: 〒114-8601 東京都荒川区西日暮野 2-1-10 東一

証明書番号: 01Y2000138-1/2  
発行年月日: 2012-01-09  
Date of Issue: 2012-01-09

行番 Item No	寸法 Dimension INCH	数量 Quantity	質量 Mass LBS KG	製鋼番号 Cast No. 鋼種番号 Test No.	引張試験 Tensile Test 引張強さ Y.S. 伸び E.L. 断面収縮率 RA	衝撃試験 Impact Test 平均値 Avg	化学成分 Chemical Composition %					Mo			
							C	Si	Mn	P	S		Ni	Cr	
					30.0 MAX MIN	75.0 MAX MIN	217	30	75	2.00	40	30	1000	1600	200
							172	17	49	84	26	1	1011	1614	206
					48.3 MAX MIN	85.457 MAX MIN	172	17	49	84	26	1	1011	1614	206
					48.3 MAX MIN	85.457 MAX MIN	172	17	49	84	26	1	1011	1614	206
					47.7 MAX MIN	86.257 MAX MIN	174	18	50	83	25	1	1010	1617	209
					47.7 MAX MIN	86.257 MAX MIN	174	18	50	83	25	1	1010	1617	209
	TOTAL	5	13522 5066												

製鋼試験結果: 引張強さ: 48.3(平均), 伸び: 85.457(平均), 断面収縮率: 8.4(平均).  
引張試験結果: Tensile Test Result: Y.S. 48.3, E.L. 85.457, RA 8.4.  
引張試験結果: Tensile Test Result: Y.S. 48.3, E.L. 85.457, RA 8.4.  
引張試験結果: Tensile Test Result: Y.S. 47.7, E.L. 86.257, RA 8.4.  
引張試験結果: Tensile Test Result: Y.S. 47.7, E.L. 86.257, RA 8.4.

引張試験結果: Tensile Test Result: Y.S. 48.3, E.L. 85.457, RA 8.4.  
引張試験結果: Tensile Test Result: Y.S. 48.3, E.L. 85.457, RA 8.4.  
引張試験結果: Tensile Test Result: Y.S. 47.7, E.L. 86.257, RA 8.4.  
引張試験結果: Tensile Test Result: Y.S. 47.7, E.L. 86.257, RA 8.4.

SOLUTION HEAT TREATMENT: 1055 X 60MIN. WATER COOLED.  
CORROSION TEST (ASTM A262 PRACTICE E): ACCEPTABLE.  
VISUAL & DIMENSIONAL INSPECTION: ACCEPTABLE.  
FINISH: NO. 1.  
AS PER EN 10204 CERTIFICATE FOR MATERIAL TESTS 3.1  
ANSI/NACE MR0175/ISO 15156-3-09

注意: 本鋼材は、標準的な試験条件で試験されたものである。試験結果は、鋼材の品質を証明しています。  
Notes: This steel is tested under standard conditions. The test results certify the quality of the material.  
注意: 本鋼材は、標準的な試験条件で試験されたものである。試験結果は、鋼材の品質を証明しています。  
Notes: This steel is tested under standard conditions. The test results certify the quality of the material.

製鋼番号: E39571  
鋼種番号: 304  
検査方法: 引張試験, 引張強さ, 伸び, 断面収縮率, 衝撃試験, 化学分析  
Test Method: Tensile Test, Yield Strength, Elongation, Reduction of Area, Impact Test, Chemical Analysis

品質保証書: 品質保証書 (Quality Assurance Certificate)  
品質保証書: 品質保証書 (Quality Assurance Certificate)

M. S. Saito  
八幡製鉄所  
原産地管理部長  
Group Manager, Plate Quality Control Dept.  
Yawata Works





44w SA36 3/8" Plate

PO# 24669

**DX DONGKUK STEEL**

**MILL TEST CERTIFICATE**

**ORIGINAL**

Order No. : J125100024  
 PO No. : LPP201210003  
 Commodity : STEEL PLATE  
 Specification : ASTM A36/CSA G40.21 300W/44W  
 Supplier : DONGKUK INTERNATIONAL INC.  
 Customer : SALZGITTER  
 Certificate No. : DP3-1-121214-124-002  
 Date of Issue : Dec. 14, 2012

Heat Number LFH9118  
 Shipper No 588070


Dimension Unit, Spec. No.	Product No	Quantity	Weight (kg)	Heat No	Tensile Test													Remarks		
					Y	T	EL	Y	C	S	P	Ni	Mo	Cr	Mn	Cu	As		Spec	
9.52-2436-7315 5"X36"X285"	A327331-01, 02, 03, 04, 05	5	1,634	LFH9118	15	39	144	15	4	30	1	1	1	1	1	1	1	395	227E	
9.52-2436-7315 5"X36"X285"	Sub Total (30)	5	8,170																404	227E
9.52-2436-7315 5"X36"X285"	A327334-01, 02, 03, 04, 05	10	13,340	1,778	23	30	109	17	6	20	1	1	1	1	1	1	19	381	227E	
12.70-2436-7315 5"X36"X285"	Sub Total (30)	10	66,920																407	227E
12.70-2436-7315 5"X36"X285"	A327329-01, 02, 03, 04, 05	6	10,695	1,778	16	38	109	12	4	29	5	1	5	1	5	1	4	407	227E	
12.70-2436-7315 5"X36"X285"	Sub Total (30)	6	63,285																	

Chemical Composition (%)

Specimen No. : 7-Top, 8-Bottom  
 Position : 1-Top, 2-Mid, 3-Bottom  
 Division : 1-Longitudinal, 2-Product Analysis  
 Surface Area (mm) : Blank-Full Size, 1-7, 5-10, 2-5, 8-10  
 Surface Area (mm) : 1-200, 2-100, 3-80, 4-70, 5-60, 6-50, 8-40, 9-30  
 Tensile Test Direction : Transverse  
 Specimen Condition : As Rolled  
 Chemical Composition Unit : 2-x100, 3-x1000, 4-x10000  
 \*Tr : Trace  
 \*NSL Result : G-No Break, B-Break  
 \*TTP Through Thickness Position : 1-Subsco, 2-1/4T, 3-1/2T

We hereby certify that this material has been made by the above process (fully killed steel, free from gas) and satisfactorily tested in accordance with the above specification requirements called for by the above order. Inspection documents : According to EN 10204 Type 3.2.

When using the enclosed product for other uses, rather than the above specification use, product damage and safety accidents may be caused.

Surveyor to : \_\_\_\_\_  
 Chief of Quality Control Team : 

Surveyor to : \_\_\_\_\_  
 Surveyor to : \_\_\_\_\_  
 Page : 2/6  
 Job# 13554

Customer Name  
 EMPRE CUTTING CORP

Customer PO#  
 amber

(113) 3/8" MS. Blade.  
 SSAB

AT# 0166 119

PO# 24096

Test Certificate

Form TCI: Revision 1: Date 31 Oct 2000

S. Paul, MN 55164-0905

Customer: RYERSON CANADA  
 161 THE WEST MALL  
 ETOBICOKE  
 ON M9C4V5

Customer P.O. No.: 719757 & 41-334155  
 Product Description: CSA G40.21(2004)44W/500W / ASTM A36(08)  
 A709(01A)36/ASME SA36(01ED)

Mail Order No.: 41-334159-03 Shipping Manifest: PR082724

Ship Date: 01 Aug 12 Cert No: 041144313  
 Cert Date: 01 Aug 12 (Page 1 of 1)

Size 0.375 X 48.00 X 96.00 (IN)

Tested Pieces		Tensiles										Charpy Impact Tests				
Heat Id	Piece Id	Tested Thickness	Tst Loc	YS (KSI)	UTS (KSI)	%RA	Elong % 2in	% Elong % 8in	Average Hardness	Abs. Energy (FTLB)	% Shear	Tst Dir	Tst Imp	Tst Dir	Tst Imp	EDWTT Temp %Shr
0166119	1897522	0.375 (T.L.C)	L	45	71		31									
0166119	1987523	0.375 (T.L.C)	L	50	68		37									
0166119	897521	0.250 (T.L.C)	L	53	71		34									
			C	50	68		24									
			L	46	72		33									
			C	49	70		32									

Heat Id 0166119

Chemical Analysis

C	Mn	P	S	SE	TotAl	Cu	Ni	Cr	Mo	Cb	V	Ti	B	N	ORGN
.19	.80	.014	.007	.01	.020	.03	.01	.03	.00	.000	.003	.001	.0000	.0037	USA

MATERIAL MARKED WITH AN ASTERISK IS PRODUCED FROM COIL PRODUCTS SHIPPED:

\* 0166119 PCEs: 58, WGT: 28425 \* 0166119 PCEs: 7, WGT: 3430  
 1987523 PCEs: 1897525

Cust Part #: 7838-0632

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

Checked by: Chad Falcysek

JSC # 13579

**(3) SSAB 38" MS. Vole** **Lot # R1729** **PO# 24669**  
**Test Certificate**

Form TC1: Revision 1: Date 31 Oct 2000

St. Paul, MN 55164-0303

Customer: RYERSON CANADA 161 THE WEST MALL ETOBICOKE ON M9C4V8		Customer P.O. No.: 736486 & 41-364721		Mill Order No. 41-364722-04		Shipping Manifest: PR09025	
		Product Description: CSA G40.21(2004)44W300W / ASTM A36(08) A709(01A)36/ASME SA36(10A11)		Ship Date: 12 Jul 13		Cert No: 041160985 (Page 1 of 1)	
		Size: 0.375 X 48.00 X 96.00 (IN)					

Tensiles:				Charpy Impact Tests									
Heat Id	Piece Id	Tst Loc	YS (KSI)	UTS (KSI)	%RA	Elong % 2in 8in	Average Hardness	Abs. Energy (FTLB) 1 2 3 Avg	% Shear 1 2 3 Avg	Tst Dir	Tst Temp	Tst Siz (mm)	BDWT Temp %Shr
R1729	5055258	L 48 C 46	67 65			34 34							

Chemical Analysis																
Heat Id	C	Mn	P	S	Si	Tot Al	Cu	Ni	Cr	Mo	Ch	V	Ti	B	N	Orgn
R1729	.14	.63	.006	.005	.02	.034	.14	.06	.05	.02	.003	.003	.001	.0001	.0070	USA

MATERIAL MARKED WITH AN ASTERISK IS PRODUCED FROM COIL.  
 PRODUCTS SHIPPED: 5055258 PCS: 21, WGT: 10290

Job # 13554  
 WE HEREBY CERTIFY THAT THIS MATERIAL WAS TESTED IN ACCORDANCE WITH, AND MEETS THE REQUIREMENTS OF, THE APPROPRIATE SPECIFICATION  
 Cust Part #: 7838-0632  
 Checked by: Chad Falleysek

HT # A3F236  
 PL # A29  
 XW294  
 10F24537  
 Oct 13

SSAB 3/8" A36/44W  
 Test Certificate

Form TC1: Revision 1: Date 31 Oct 2000

1770 Bill Sharp Boulevard, Muscatine, IA 52761-9412

Customer: SAMUEL & SON LIMITED  
 (A DIVISION OF SAMUEL SALES)  
 2360 DIXIE ROAD  
 MISSISSAUGA  
 ON L4Y1Z7

Customer P.O.No.: U01440 & 41-365188  
 Product Description: CSA G40.21(2004)44/300/38W; ASTM A36(08)  
 A709(09A)36/ASME SA36(10)  
 CSA G40.21(2004)260W

Mill Order No. 41-365189-06  
 Shipping Manifest: MR201395  
 Ship Date: 24 Jun 13  
 Cert Date: 24 Jun 13  
 Cert No: 061394255  
 (Page 1 of 1)

Size: 0.375 X 96.00 X 480.0 (IN)

Heat Id	Tst Loc	YS (KSI)	Tst Dir	Tensiles:			Charpy Impact Tests			EDWTT Tmp %Shr										
				UTS (KSI)	%RA	Elong %	Average Hardness	Abs. Energy (FTLB)	% Shear		Tst Imp	Tst Dir	Tst Siz (mm)							
A3F236	L 52	68	T	68	38															

Heat Id: A3F236

Chemical Analysis															
C	Mn	P	S	Si	Tot Al	Cu	Ni	Cr	Mo	Cb	V	Ti	B	N	ORGN
.06	1.30	.011	.002	.35	.030	.27	.14	.09	.04	.001	.005	.009	.0005	.0080	USA

MERCURY IS NOT A METALLURGICAL COMPONENT OF THE STEEL AND NO MERCURY WAS INTENTIONALLY ADDED DURING THE MANUFACTURE OF THIS PRODUCT  
 MTR EN 10204:2004 INSPECTION CERTIFICATE 3.1 COMPLIANT  
 PRODUCTS SHIPPED: A29 PCES: 10, WGT: 49108  
 A3F236

SAMUEL, SON & CO., LTD.  
 CERTIFIED COPY OF  
 TEST REPORT

CUSTOMER NO. 41291  
 OUR ORDER 032153  
 DATE Oct 16/13  
 FILED BY

Customer Part #: \_\_\_\_\_

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

\_\_\_\_\_ B. H. Wales  
 SENIOR METALLURGIST - PRODUCT

Head No. 24668  
 PO# 24668  
 Invo No. 1003  
 Date of Issue 13/05/2013  
 PO# 24668  
 Invo No. 1003  
 Date of Issue 13/05/2013

# INSPECTION CERTIFICATE

Purchaser: TRANS-AM PIPING PRODUCTS LTD.



Thai Benkan Co., Ltd.  
 58 Soi Western, Bangkro, Prapokkong,  
 Sampran, 10130 Thailand.

TO EN10204 3.1

E.No. A-009  
 Purchase Order No. Ck-13-424  
 Job No.  
 D M. Y Certificate No. 27/09/2013 T-2013180154

No.	MFG. No.	Specification for Material		Specification for Inspection	Visual Examination	Dimensional Inspection
		Product & Size	Quantity			
1	12K20098	RC WPB S X 1 1/4 S80	5	N	Good	Good
2	13G20212	RC WPB S X 1 1/2 S80	25	N	Good	Good
3	56S20156	RC WPB X 2 SIDAS	4380	N	Good	Good
4	13E20214	RC WPB 1/2 X 10 S40	10	N	Good	Good
5	13B00037	90 EL WPB 10 S100	260	A	Good	Good

Specification	Chemical Composition %													Tensile Test #2	E		
	C	Mn	P	S	Si	Cr	Ni	Cu	Mo	Al	Nb	TS	YS			TS	%
Min.	100	100	100	100	100	100	100	100	100	100	100	1000	1000	1000	100	MPa	
Max.	10	28	0.02	0.02	0.05	0.01	0.01	0.01	0.01	0.01	0.01	240	415	30		197 HB	GOOD
Material Heat No.	30	708	50	59	40	46	40	45	30	20	20	240	415	30		197 HB	GOOD
1 972846	15	18	18	6	14	10	22	7	0	0	35	330	470	39			
2 1-94247	19	24	14	4	1	1	2	2	2	1	34	352	503	46			
3 26407	16	23	13	1	4	2	10	2	2	1	34	323	472	35			
4 2-84188	19	25	12	3	1	1	2	2	2	1	39	280	498	41			
5 99L1238	19	19	12	8	1	2	5	1	0	0	34	335	515	44			

ORIGINAL

Quality Assurance Manager  
 Thai Benkan Co., Ltd.

Job# 13554

(Note 1) A : For formed with final temperature between 620 °C-900°C, Air Cooling; N : Normalizing 910°C/0.5 HR, Air Cooling  
 The design was manufactured, sampled, tested and inspected in accordance with the specification and was found to meet the requirements.  
 C.E. = C=Min/(6+(C-3)(6-3)/5)-(N+Cb)/15  
 \* 1 : T symbolized wall thickness in mm. \* 2 : YS Yield strength, TS = Tensile strength, E = Elongation  
 We hereby certify that the product described herein has been manufactured in accordance with the specifications concerned and also with the purchaser's requirements and that the test results shown herein are correct.  
 Note for WPB: For each reduction of 0.10% below the specified carbon maximum, an increase of 0.06% manganese above the specified maximum will be permitted up to a maximum of 1.55%  
 Form TZ-66/4



PennWest c/o Pioneer Engineering  
TCTI Job# 13554-V  
P.O. # PEI-A13370744-04  
LSD: d-55-A/94-P-10  
Jan. 2014

**4.0 In-House Dimensional Check Report**

**TORNADO Combustion Technologies Inc.**  
#200 261200 Wagon Wheel Way  
Md of Rockyview, AB T4A 0E3  
Ph 403-244-3333  
Fax 403-275-3740



# Dimension Inspection Report

**TORNADO Technologies Inc.**

<b>ATTN:</b>	Sam batts	<b>Inspector:</b>	Andrew Little	<b>Dwg Rev:</b>	1
<b>Job #:</b>	13554	<b>Date:</b>	19-Dec-13		
<b>P.O.#:</b>		<b>Shop:</b>	Gadsby		
<b>End User:</b>	PennWest	<b>Dwg #:</b>	PennWest-13554		

Quantity	Description	Tag Item #
1	5'-0" Dia x 10'-0" S/S A.G.K.O.	

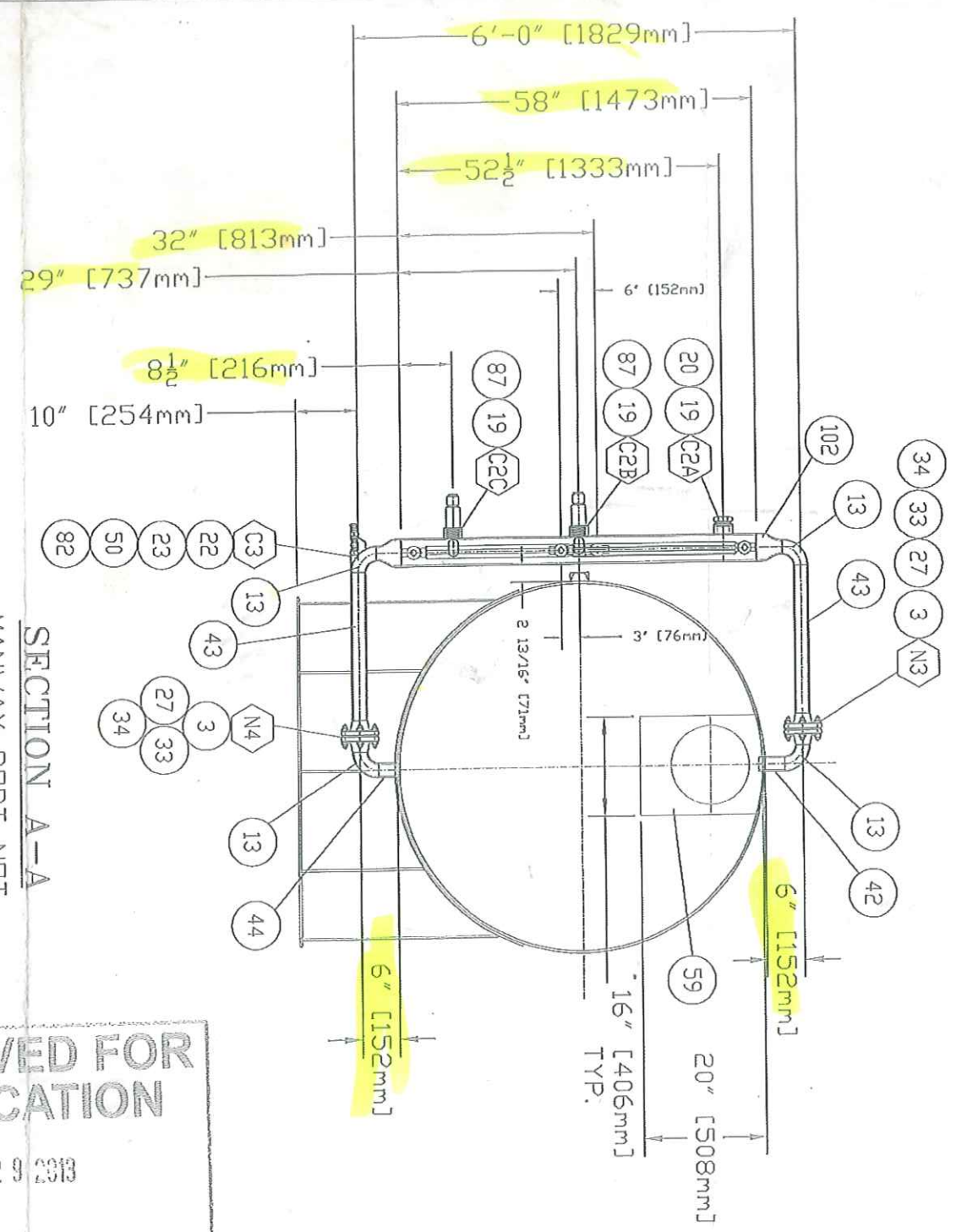
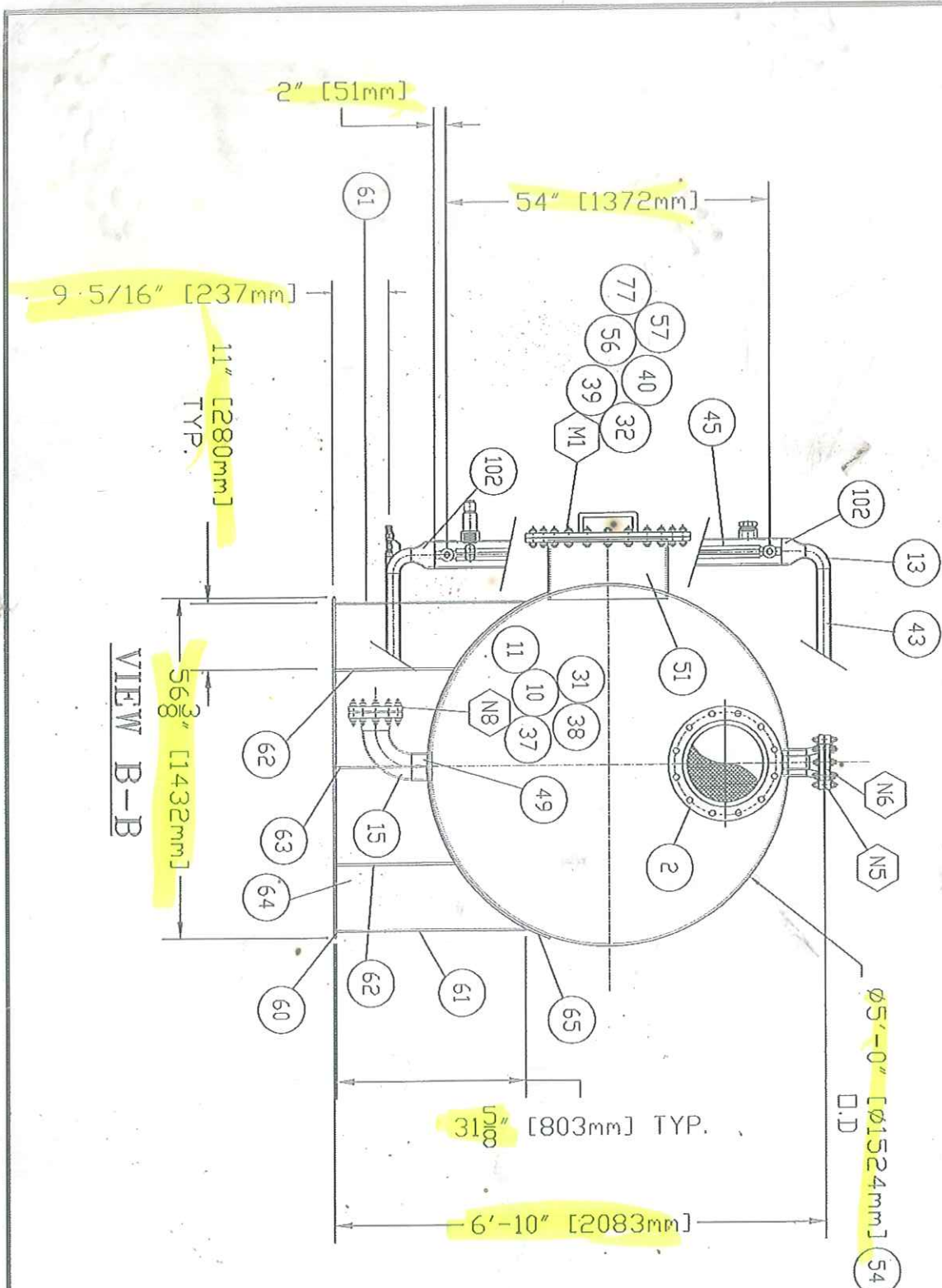
**Inspection**

The dimensions found were consistant with tolerances on the drawing  
PennWest-13554

No outstanding issues were found.

<b>Name &amp; Signature of Inspector</b>	Andrew Little CET	
--	-------------------	--

**Suppliers Conformation Statement:** We certify that the P.O. items listed, and the required Q.C. dimensions meet the requirements of the procurement documents meet or are with suitable tolerance of the approved drawing supplied.



SECTION A-A  
MANWAY PORT NOT  
SHOWN IN THIS VIEW.

APPROVED FOR  
FABRICATION  
OCT 29 2013  
IF IN DOUBT ASK!

Rev.	Description	By	Y	M	D
1	ISSUED FOR CONSTRUCTION	HW	13	10	29
0	ISSUED FOR APPROVAL PURPOSES	HW	13	07	17

**General Notes:**  
1) MTRS PROVIDED ON REQUEST AND RECEIPT OF ORDER.

**Coating & Preparation:**  
1) VESSEL EXTERIOR:  
SANDBLAST: SSFC-SP6  
PRIMER: DEVDE CATHODIC 302H, 25-40 mils DFT  
TOPCOAT: CLOVERDALE ARMORSHIELD  
2-3 mils DFT WASH GREY  
2) VESSEL INTERIOR:  
SANDBLAST: SSFC-SP10  
INTERNAL COATING DEVDE 253, 10-18 mils

**Fabrication Tolerances**

Fractional	±1/8"
00" to 02"	±1/4"
Greater than 02"	±1/4"
Decimal:	±1/8"
00" to 02"	±1/4"
Greater than 02"	±1/4"
Angular:	±2°
All	±2°

\*Unless otherwise stated

Name of Plant:	-
Lease:	-
Weight - Total Combined:	6,700 LBS.
Weight - Vessel Only:	4,200 LBS.
Weight - Skid & Building:	2,500 LBS.
Design Pressure:	14.7 PSIG
Hydrotest Pressure:	22 PSIG
Max. Operating Pressure:	14.7 PSIG
Design Code:	NBC 2010
Weld Procedure:	#13232
APEGA Permit To Practice:	#P10806
CWB Registration Number:	TORNG1

Drawing Number:	PENNWEST-13554-GA(2)
Drawn By:	HW
Checked By:	EV
Date Drawn:	JULY/17/13
Job Number:	13554
Quote Number:	-
Tag Number:	-
Size Of Vessel in Barrels:	50 BBL.S.
Corrosion Allowance:	-

**Title:**  
05'-0" O.D. X 10'-0" L.G. S.S.  
AGKD TANK (50 bbl.)  
C/W 012" INLET/OUTLET CONN.

**Customer:**  
PENNWEST C/O  
PIONEER ENGINEERING

**P.O.#:**  
-

**Salesperson:**  
SAMUEL BATTS

Sheet 2 of 3

**TORNADO COMBUSTION TECHNOLOGIES INC.**  
1-888-882-3882

Any Technical Data and the Designs Disclosed herein are the Exclusive Property of Tornado Technologies Inc. and/or Controlled the Proprietary Rights of Others and are not to be used or disclosed to Others without the Written Consent of Tornado Technologies Inc.



NOZZLE, COUPLING & MANWAY SCHEDULE

Mark No.	Qty.	Size	Material	Rating	Service	Projection	Welding	Flillet	Description	Erection	Orientation
						Radius	Number	A B C D			Angle
N1	1	ø12" [323.9mm]	SA 105N	150J	INLET/OUTLET CONNECTION	1/2" [23.375]	2.3	1/4"	R.F. WELD NECK	5'-5 1/2" [1664mm]	END
N2	1	ø12" [323.9mm]	SA 105N	150J	INLET/OUTLET CONNECTION	1/2" [23.375]	2.3	1/4"	R.F. WELD NECK	5'-5 1/2" [1664mm]	END
N3	1	ø2" [60.3mm]	SA 105N	150J	FLOAT BRDLE CONNECTION	0"	2.3	1/4"	R.F. WELD NECK	6'-0" [1829mm]	TOP
N4	1	ø2" [60.3mm]	SA 105N	150J	FLOAT BRDLE CONNECTION	0"	2.3	1/4"	R.F. WELD NECK	10" [254mm]	BOTTOM
N5	1	ø2" [60.3mm]	SA 105N	150J	VENT CONNECTION	1/2"	6"	1/4"	R.F. WELD NECK	SEE DRAWING	TOP
N6	1	ø2" [60.3mm]	SA 105N	150J	SPARE CONNECTION	1/2"	6"	1/4"	R.F. WELD NECK	SEE DRAWING	TOP
N7	1	ø2" [60.3mm]	SA 105N	150J	DRAIN CONNECTION	0"	6"	1/4"	R.F. WELD NECK	10" [254mm]	BOTTOM
N8	1	ø2" [60.3mm]	SA 105N	150J	TRUCKOUT CONNECTION	0"	6"	1/4"	R.F. WELD NECK	7" [177mm]	BOTTOM
N9	1	ø2" [60.3mm]	SA 105N	150J	SIGHT GLASS CONNECTIONS	0"	9"	1/4"	R.F. WELD NECK	SEE DRAWING	BRDLE
N10	1	ø2" [60.3mm]	SA 105N	150J	LEVEL SWITCH CONNECTIONS	0"	9"	1/4"	R.F. WELD NECK	SEE DRAWING	BRDLE
N11	1	ø2" [60.3mm]	SA 105N	150J	FLOAT BRDLE DRAIN	0"	2.3	1/4"	R.F. WELD NECK	SEE DRAWING	BRDLE
N12	1	ø20" [508mm]	SA 36 CS	FAB.	INSPECTION MANWAY	1/2"	8"	3/8"	R.F. FLANGE	3'-10" [1168mm]	SIDE

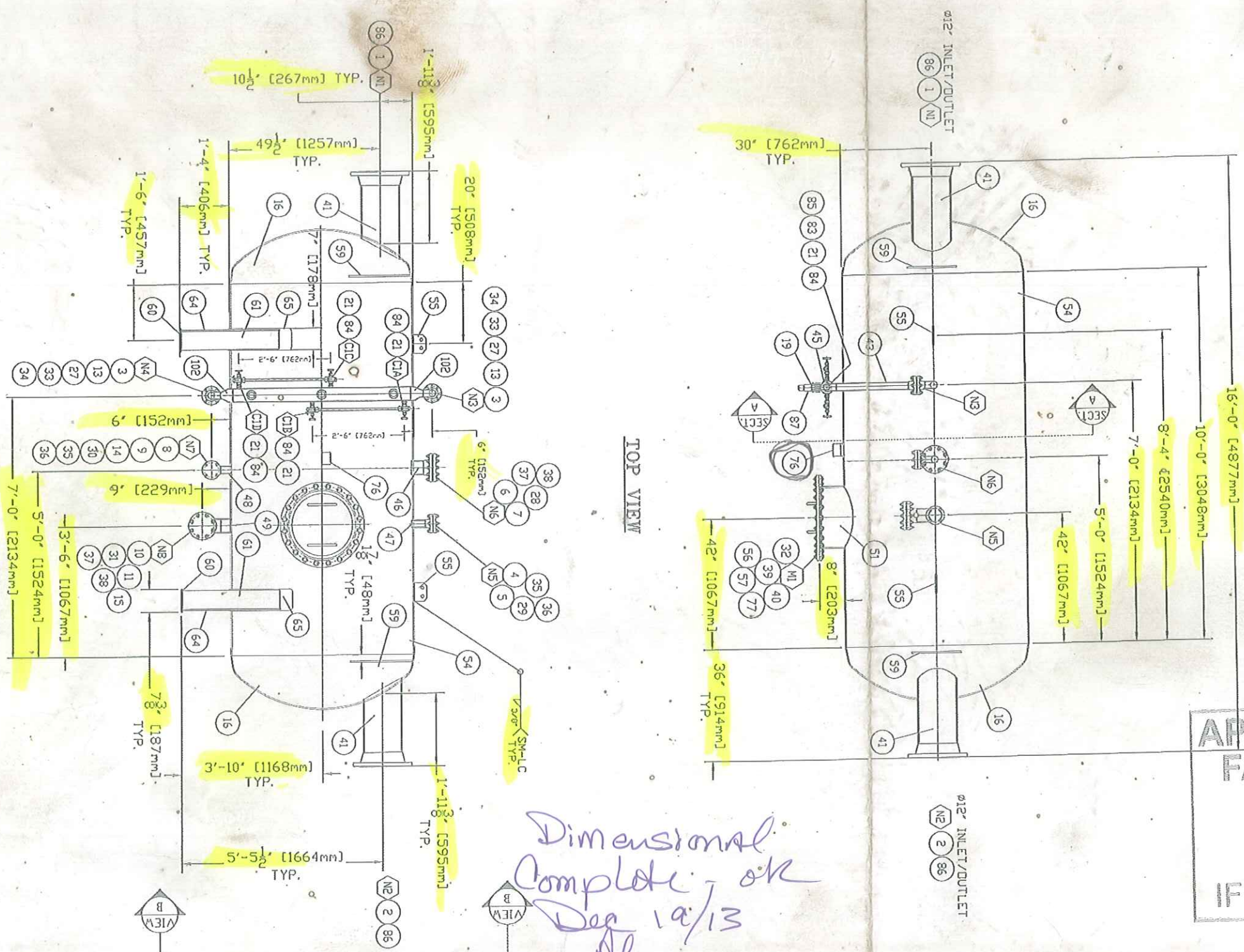
NDT Notes:

% Of Radiography On Vessel Welds:	0%
Impact Testing:	NDNE
Magnetic Particle Testing Of All Lifting Attachments & Gussets:	NDNE
Ultra Sonic Testing:	NDNE
Dye Penetrant:	NDNE

NOTE: INTEGRAL KNOCKOUT INTERIOR IS TO BE SANDBLASTED TO SSPC-SP10 AND COATED WITH 10-18 MILS OF DEVCO 253 COATING.

Weld Procedure	Weld Procedure	Weld Procedure	Weld Procedure	Weld Procedure	Weld Procedure	Weld Procedure
TT-1	TT-1, TT-21	TT-1, TT-31	TT-1, TT-31	TT-1, TT-31, TT-7	TT-1, TT-31	TT-1, TT-31

APPROVED FOR FABRICATION  
OCT 29 2013  
IF IN DOUBT ASK!



*Dimensional Complete, ok  
Dec 19/13  
[Signature]*

Rev.	Description	By	Y	M	D
1	ISSUED FOR CONSTRUCTION	HW	13	10	29
0	ISSUED FOR APPROVAL PURPOSES	HW	13	07	17

**General Notes:**  
1) HRS PROVIDED ON REQUEST AND RECEIPT OF ORDER.

**Coating & Preparation:**  
1) VESSEL EXTERIOR: SANDBLAST SSPC-SP6 PRIMER DEVCO CATHCOAT 302H, 2.5-4.0 MILS DFT TOPCOAT: CLOVERLEAF ARMORSHIELD 2-3 MILS DFT WASH GREY.  
2) VESSEL INTERIOR: SANDBLAST SSPC-SP10 INTERNAL COATING DEVCO 253, 10-18 MILS

**Fabrication Tolerances:**  
Fractions: 60" to 624" ±1/8", Greater than 624" ±1/4"  
Decimal: 60" to 624" ±1/8", Greater than 624" ±1/4"  
Angular: All ±2"  
\*Unless otherwise stated

Name of Plant:	
Lease:	
Weight - Total Combined:	6,700 LBS.
Weight - Vessel Only:	4,200 LBS.
Weight - Skid & Building:	2,500 LBS.
Design Pressure:	14.7 PSIG
Hydrotest Pressure:	22 PSIG
Max. Operating Pressure:	14.7 PSIG
Design Code:	NBC 2010
Weld Procedure:	#12232
APEGGA Permit To Practice:	#P10806
CWB Registration Number:	TDRNG1

Drawing Number:	PENNWEST-13554-GA(1)
Drawn By:	HW
Checked By:	EV
Date Drawn:	JULY/17/13
Job Number:	13554
Quote Number:	
Tag Number:	
Size Of Vessel in Barrels:	50 BBLs.
Corrosion Allowance:	

**Title:** 65'-0" DD X 10'-0" L.G. S.S. AGKD TANK (50 bbl.) C/W ø12" INLET/OUTLET CONN.  
**Customer:** PENNWEST C/O PIONEER ENGINEERING  
**P.O.#:**  
**Salesperson:** SAMUEL BATTIS

Sheet 1 of 3

TORNADO COMBUSTION TECHNOLOGIES INC.  
1-888-882-3802

Any Technical Data and the Design Disclosed herein are the Exclusive Property of Tornado Technologies Inc. and/or its Affiliates. All Rights Reserved. No part of this document may be reproduced or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written consent of Tornado Technologies Inc.



PennWest c/o Pioneer Engineering  
TCTI Job# 13554-V  
P.O. # PEI-A13370744-04  
LSD: d-55-A/94-P-10  
Jan. 2014

**5.0 Hydrostatic Test Report**

**TORNADO Combustion Technologies Inc.**  
#200 261200 Wagon Wheel Way  
Md of Rockyview, AB T4A 0E3  
Ph 403-244-3333  
Fax 403-275-3740



Tornado Combustion  
Technologies Inc.

Head Office  
#200 261200  
Wagon Wheel Way  
MD of Rockyview  
Ph. 403-244-3333  
Fax 403-275-3740

## Hydrostatic Pressure Test Report

ATTN:	Sam Batts	Shop:	Gadsby	Dwg Rev:	1
Job #:	13554-V	Date:	23-Dec-13		
P.O.#:	PEI-A13370744-04	Tag #:			
End User:	PennWest	Dwg #:	PennWest-13554		

Test Conducted By:	Andrew Little CET & Ty Wilson				
Product Description	5'-0" Dia x 10'-0" S/S A.G.K.O.				
Gauge Serial Number	TCTI-60-1, TCTI-60-2				
Holding Time @ Pressure PSIG	1 Hr. @ 22 PSIG	Gauge Selecton - 1.5 x Test Pressure			
		No More than 4 x Test Pressure			

Inspection Notes: Passed

### Hydrotest Procedure to follow B31.3 Code.

1. Ensure all studs and nuts are torqued properly before starting Hydro-Test
2. Place "Hydro Test in Progress" signs in sight.
3. Ramp up Hydrostaic Test Pressure by 10 psig at one time and hold for 5 Minutes.
4. Check for Leaks and then Proceed to the next 10 psig; Again hold for 5 Minutes.
5. Continue this process until reaching desired Hydrostatic Test Pressure.
6. Hold Final Test Pressure for 30 Minutes and check for Leaks.

**NOTE: DO NOT TIGHTEN OR LOOSEN STUDS OR NUTS WHILE UNDER PRESSURE.**

Name & Signature of Inspector Andrew Little QA/QC Mgr. *Andrew Little*

Name & Signature of Owner

Comments:



PennWest c/o Pioneer Engineering  
TCTI Job# 13554-V  
P.O. # PEI-A13370744-04  
LSD: d-55-A/94-P-10  
Jan. 2014

**6.0 Vessel Blast Profile Report**

**TORNADO Combustion Technologies Inc.**  
#200 261200 Wagon Wheel Way  
Md of Rockyview, AB T4A 0E3  
Ph 403-244-3333  
Fax 403-275-3740

# SURFACE PREPARATION REPORT

Customer: <b>TORNADO COMBUSTION TECHNOLOGIES INC.</b>		Work Order: <b>3040</b>	
Description: <b>5' X 10' AGKO UNIT</b>		Tank No. <b>PO 24994 JOB 13554</b>	Location: <b>OUTDOOR BLAST BAY</b>
<b>PRE BLAST INSPECTION</b>		Date: <b>DECEMBER 28, 2013</b>	Time: <b>09:00</b>
Welds Smooth <b>YES</b>	Radius Edges <b>YES</b>	Weld Spatter Removed <b>NO</b>	Grinding Complete <b>YES</b>
Shipping Damage <b>NO</b>	Repairs Required <b>NO</b>	Nonconformance Report <b>NO</b>	Acceptable <b>YES</b>
<b>COMMENTS: SOME ADDITIONAL CHIPPING WAS REQUIRED TO REMOVE WELD SPATTER.</b>			
<b>X</b>		Date: <b>DECEMBER 28, 2013</b>	
<small>QA INSPECTOR - B. ROBEIARD</small>			
<b>SURFACE PREPARATION</b>		Date: <b>DECEMBER 28, 2013</b>	Time: <b>15:00</b>
R.H.: <b>46.2%</b>	Ambient: <b>-15.3°C</b>	Substrate: <b>-21°C</b>	Dew Point: <b>-24.3°C</b>
		Internal: <b>COMPLETE INT. NEAR WHITE BLAST NACE# 2 SSPC-SP- 10</b>	External: <b>COMPLETE EXT. COMMERCIAL GRADE NACE# 3 SSPC-SP- 6</b>
<b>BLAST EQUIPMENT AIR SUPPLY</b>		Compressor: <b>GRIMMER SCHMIDT 800 CFM</b>	
Moisture Traps <b>YES</b>	Oil Traps <b>YES</b>	Air Movers <b>YES</b>	Water Knock Out: <b>YES</b>
Nozzle Size <b>7</b>	Nozzle Pressure: <b>110 PSL.</b>	Pressure Gauge: <b>YES</b>	Hypothermic Needle Gauge: <b>NO</b>
Blotter Test: <b>NO</b>	Abrasive Type/Size <b>STARBLAST XL (INT.) TARGET 30/50 (EXT.)</b>	Surface Prep. Technician: <b>MYLES HAZEN</b>	
<b>COMMENTS: BLAST WAS FOUND TO BE ACCEPTABLE.</b>			
<b>X</b>		Date: <b>DECEMBER 28, 2013</b>	
<small>PROJECT SUPERVISOR - C. NOTHSTEIN</small>		<small>3RD PARTY INSPECTOR</small>	





PennWest c/o Pioneer Engineering  
TCTI Job# 13554-V  
P.O. # PEI-A13370744-04  
LSD: d-55-A/94-P-10  
Jan. 2014



**7.0 Vessel Internal Coating Report**

**TORNADO Combustion Technologies Inc.**  
#200 261200 Wagon Wheel Way  
Md of Rockyview, AB T4A 0E3  
Ph 403-244-3333  
Fax 403-275-3740

# COATING REPORT

Customer: <b>TORNADO COMBUSTION TECHNOLOGIES INC.</b>		Work Order: <b>3040</b>		
Description: <b>5' X 10' AGKO UNIT</b>		Tank No. <b>PO 24994 JOB 13554</b>		Location: <b>OUTDOOR BLAST BAY</b>
<b>COATING APPLICATION</b>				
DATE: <b>DECEMBER 30, 2013</b>		TIME: <b>14:00</b>		PIECES: <b>1</b>
Internal <input checked="" type="checkbox"/> External <input type="checkbox"/>				
Relative Humidity <b>13.0%</b>	Ambient Temp. <b>18.3°C</b>	Surface Temp. <b>19°C</b>	Dew Point <b>-10.6°C</b>	Coating Temp <b>18°C</b>
COAT #    1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>				
Application Method:    Airless <input checked="" type="checkbox"/> Conventional <input type="checkbox"/> Lance <input type="checkbox"/> Brush/Roll <input type="checkbox"/>				
Applicator: <b>C. NOTHSTEIN</b>			Prepared / Mixed by: <b>C. NOTHSTEIN</b>	
Coating Manufacturer & Type: <b>DEVOE, DEVCHEM 253</b>				
Color: <b>BLUE</b>		Color No. <b>N/A</b>		Amount used: <b>2 ½ GAL.</b>
Base Batch/Lot # <b>PG1908UA 46405</b>			Catalyst Batch/Lot # <b>PF1014UA 45825</b>	
Thinner: <b>T- 10</b>		Batch/Lot# <b>PG2032UH</b>		Thinner used: <b>3%</b>
Induction: <b>20 MIN.</b>	Pump Size: <b>63:1</b>	Heater/Setting: <b>0</b>	Tip Size: <b>419</b>	
<b>COATING INSPECTION</b>			INSPECTED PIECES: <b>1</b>	
Appearance: <b>SMOOTH &amp; UNIFORM</b>		Coating Defects: <b>NONE</b>		Location: <b>N/A</b>
Repairs Required: <b>NONE</b>				
Repair Material: <b>N/A</b>		Base Batch # <b>N/A</b>		Cat. Batch # <b>N/A</b>
Repairs Accepted? <b>N/A</b>				
<b>INSPECTION: DRY FILM THICKNESS</b>				
Gauge Type & S/N: <b>ELEKTRO PHYSIK</b>			Calibrated This Day? <b>YES</b>	
Location	Average	High	Low	Readings
<b>1<sup>ST</sup> COAT</b>	<b>5.8 MILS</b>	<b>9.9 MILS</b>	<b>2.7 MILS</b>	<b>149</b>
<b>COMMENTS: COATING IS ACCEPTABLE FOR APPLICATION OF SECOND COAT.</b>				
Project inspected and acceptable to meet specification? <b>YES</b>				
 QC MANAGER - B. ROBBIARD		 3RD PARTY INSPECTOR		Date: <b>DECEMBER 31, 2013</b>

# COATING REPORT

Customer: <b>TORNADO COMBUSTION TECHNOLOGIES INC.</b>		Work Order: <b>3040</b>		
Description: <b>5' X 10' AGKO UNIT</b>		Tank No. <b>PO 24994 JOB 13554</b>		Location: <b>OUTDOOR BLAST BAY</b>
<b>COATING APPLICATION</b>				
DATE: <b>DECEMBER 31, 2013</b>		TIME: <b>13:00</b>		PIECES: <b>1</b>
Internal <input checked="" type="checkbox"/> External <input type="checkbox"/>				
Relative Humidity <b>11.0%</b>	Ambient Temp. <b>21.2°C</b>	Surface Temp. <b>21°C</b>	Dew Point <b>-10.5°C</b>	Coating Temp <b>22°C</b>
COAT #    1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>				
Application Method:    Airless <input checked="" type="checkbox"/> Conventional <input type="checkbox"/> Lance <input type="checkbox"/> Brush/Roll <input type="checkbox"/>				
Applicator: <b>C. NOTHSTEIN</b>			Prepared / Mixed by: <b>B. ROBBIARD</b>	
Coating Manufacturer & Type: <b>DEVOE, DEVCHEM 253</b>				
Color: <b>WHITE</b>		Color No. <b>N/A</b>		Amount used: <b>2 ½ GAL.</b>
Base Batch/Lot # <b>PJ3503UA 47435</b>			Catalyst Batch/Lot # <b>PF1014UA 45825</b>	
Thinner: <b>T- 10</b>		Batch/Lot# <b>PG2032UH</b>		Thinner used: <b>2%</b>
Induction: <b>20 MIN.</b>	Pump Size: <b>63:1</b>	Heater/Setting: <b>0</b>	Tip Size: <b>419</b>	
<b>COATING INSPECTION</b>			INSPECTED PIECES: <b>1</b>	
Appearance: <b>SMOOTH &amp; UNIFORM</b>		Coating Defects: <b>LOW</b>		Location: <b>SHELL</b>
Repairs Required: <b>SMALL ISOLATED LOW THICKNESS AREAS WERE FOUND, ADDITIONAL COATING WAS BRUSH/ROLLED ON THE AREAS TO BUILD THICKNESS.</b>				
Repair Material: <b>DEVOE 253</b>		Base Batch # <b>PJ3503UA 47435</b>		Cat. Batch # <b>PF1014UA 45825</b>
Repairs Accepted? <b>YES</b>				
<b>INSPECTION: DRY FILM THICKNESS</b>				
Gauge Type & S/N: <b>ELEKTRO PHYSIK</b>			Calibrated This Day? <b>YES</b>	
Location	Average	High	Low	Readings
<b>2<sup>ND</sup> COAT</b>	<b>13.4 MILS</b>	<b>19.4 MILS</b>	<b>9.0 MILS</b>	<b>220</b>
<b>COMMENTS: AFTER THE REPAIRS WERE COMPLETE THE COATING WAS FOUND TO BE ACCEPTABLE.</b>				
Project inspected and acceptable to meet specification? <b>YES</b>				
 QC MANAGER - B. ROBBIARD		 3RD PARTY INSPECTOR		Date: <b>JANUARY 2, 2014</b>







PennWest c/o Pioneer Engineering  
TCTI Job# 13554-V  
P.O. # PEI-A13370744-04  
LSD: d-55-A/94-P-10  
Jan. 2014

8.0 Vessel Internal Holiday Test Report

TORNADO Combustion Technologies Inc.  
#200 261200 Wagon Wheel Way  
Md of Rockyview, AB T4A 0E3  
Ph 403-244-3333  
Fax 403-275-3740

# HOLIDAY TEST REPORT

Customer: <b>TORNADO COMBUSTION TECHNOLOGIES INC.</b>		Work Order: <b>3040</b>	
Description: <b>5' X 10' AGKO</b>		Tank No. <b>PO 24994 JOB 13554</b>	Location: <b>OUTDOOR BLAST BAY</b>
<b>HOLIDAY TEST</b>			
DATE: <b>JANUARY 2, 2014</b>		TIME: <b>09:00</b>	PIECES: <b>1</b>
Internal <input checked="" type="checkbox"/>		External <input type="checkbox"/>	
Test Performed by: <b>B. ROBBIARD</b>			
Type of Tester: <b>TINKER &amp; RASOR M-1 67.5 VOLT</b>			
High Voltage <input type="checkbox"/>		Low Voltage <input checked="" type="checkbox"/>	
Dry Spark: <input type="checkbox"/>	Detergent: <input type="checkbox"/>	Other:	
Wet Sponge: <input checked="" type="checkbox"/>	Surfactant: <input checked="" type="checkbox"/>		
Area Tested: <b>COMPLETE INTERNAL</b>			
Number of Holidays Detected: <b>0</b>		Holidays Marked With: <b>N/A</b>	
Location and Causes of Holidays: <b>NO HOLIDAYS WERE FOUND.</b>			
Repair Procedure: <b>N/A</b>			
Repair Material: <b>N/A</b>	Base Batch # <b>N/A</b>	Cat. Batch # <b>N/A</b>	
<b>FINAL INSPECTION</b>			Date: <b>N/A</b>
Tester: <b>N/A</b>	Holidays: <b>N/A</b>	Location: <b>N/A</b>	
Repairs Required: <b>N/A</b>			
Repair Material: <b>N/A</b>	Base Batch # <b>N/A</b>	Cat. Batch # <b>N/A</b>	
Repairs Accepted? <b>N/A</b>			
<b>HOLIDAY FREE:</b> <b>YES</b>	Date: <b>JANUARY 2, 2014</b>	Time: <b>12:00</b>	
<b>COATING CURE:</b> <b>FORCED AIR</b>	Time/ Temperature: <b>12 HOURS @ 60°C</b>	Type of Test: <b>MEK RUB</b> Accept: <input checked="" type="checkbox"/> Reject: <input type="checkbox"/>	
<b>COMMENTS: COATING WAS FOUND TO BE ACCEPTABLE AND HAS BEEN</b>			
<b>RELEASED FOR SHIPPING.</b>			
Project inspected and acceptable to meet specification? <b>YES</b>			
 QC MANAGER - B. ROBBIARD		 3RD PARTY INSPECTOR	
		Date: <b>JANUARY 3, 2014</b>	





PennWest c/o Pioneer Engineering  
TCTI Job# 13554-V  
P.O. # PEI-A13370744-04  
LSD: d-55-A/94-P-10  
Jan. 2014



9.0 Vessel External Coating Report

TORNADO Combustion Technologies Inc.  
#200 261200 Wagon Wheel Way  
Md of Rockyview, AB T4A 0E3  
Ph 403-244-3333  
Fax 403-275-3740

# COATING REPORT

Customer: <b>TORNADO COMBUSTION TECHNOLOGIES INC.</b>		Work Order: <b>3040</b>		
Description: <b>5' X 10' AGKO UNIT</b>		Tank No. <b>PO 24994 JOB 13554</b>		Location: <b>OUTDOOR BLAST BAY</b>
<b>COATING APPLICATION</b>				
DATE: <b>JANUARY 2, 2014</b>		TIME: <b>14:00</b>		PIECES: <b>7</b>
Internal <input type="checkbox"/>		External <input checked="" type="checkbox"/>		
Relative Humidity <b>20.9%</b>	Ambient Temp. <b>22.3°C</b>	Surface Temp. <b>24°C</b>	Dew Point <b>-1.1°C</b>	Coating Temp <b>21°C</b>
COAT #    1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>				
Application Method:    Airless <input checked="" type="checkbox"/> Conventional <input type="checkbox"/> Lance <input type="checkbox"/> Brush/Roll <input type="checkbox"/>				
Applicator: <b>C. NOTHSTEIN</b>			Prepared / Mixed by: <b>C. NOTHSTEIN</b>	
Coating Manufacturer & Type: <b>CLOVERDALE, ARMOURSHIELD</b>				
Color: <b>WARM GREY</b>		Color No. <b>F-34</b>		Amount used: <b>3 GAL.</b>
Base Batch/Lot # <b>W13J8122</b>			Catalyst Batch/Lot # <b>W13J8235</b>	
Thinner: <b>T-9 DILUENT</b>		Batch/Lot# <b>N/A</b>		Thinner used: <b>10%</b>
Induction: <b>30 MIN.</b>	Pump Size: <b>1595</b>	Heater/Setting: <b>0</b>	Tip Size: <b>313</b>	
<b>COATING INSPECTION</b>			INSPECTED PIECES: <b>7</b>	
Appearance: <b>SMOOTH &amp; UNIFORM</b>		Coating Defects: <b>BENCH M.</b>		Location: <b>MANIFOLD</b>
Repairs Required: <b>BENCH MARKS ON THE UNDERSIDE OF THE MANIFOLD WERE TOUCHED UP WITH ARMORSHIELD.</b>				
Repair Material: <b>ARMORSHIELD</b>		Base Batch # <b>W13J8122</b>		Cat. Batch # <b>W13J8235</b>
Repairs Accepted? <b>YES</b>				
<b>INSPECTION: DRY FILM THICKNESS</b>				
Gauge Type & S/N: <b>ELEKTRO PHYSIK</b>			Calibrated This Day? <b>YES</b>	
Location	Average	High	Low	Readings
<b>COMPLETE EXT.</b>	<b>6.1 MILS</b>	<b>9.9 MILS</b>	<b>3.5 MILS</b>	<b>45</b>
<b>COMMENTS: EXTERNAL COATING WAS FOUND TO BE ACCEPTABLE.</b>				
Project inspected and acceptable to meet specification? <b>YES</b>				
 X QC MANAGER - B. ROBBIARD		 X 3RD PARTY INSPECTOR		Date: <b>JANUARY 3, 2014</b>

# COATING REPORT

Customer: <b>TORNADO COMBUSTION TECHNOLOGIES INC.</b>		Work Order: <b>3040</b>	
Description: <b>5' X 10' AGKO UNIT</b>		Tank No. <b>PO 24994 JOB 13554</b>	Location: <b>OUTDOOR BLAST BAY</b>
<b>COATING APPLICATION</b>			
DATE: <b>DECEMBER 30, 2013</b>		TIME: <b>11:00</b>	PIECES: <b>7</b>
Internal <input type="checkbox"/>		External <input checked="" type="checkbox"/>	
Relative Humidity <b>13.0%</b>	Ambient Temp. <b>18.3°C</b>	Surface Temp. <b>19°C</b>	Dew Point <b>-10.6°C</b>
Coating Temp <b>18°C</b>			
COAT #    1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>			
Application Method:    Airless <input checked="" type="checkbox"/> Conventional <input type="checkbox"/> Lance <input type="checkbox"/> Brush/Roll <input type="checkbox"/>			
Applicator: <b>C. NOTHSTEIN</b>		Prepared / Mixed by: <b>C. NOTHSTEIN</b>	
Coating Manufacturer & Type: <b>DEVOE, CATHA COAT 302H</b>			
Color: <b>GREEN</b>		Color No. <b>N/A</b>	Amount used: <b>3 GAL.</b>
Base Batch/Lot # <b>ND7128UA 38199</b>		Catalyst Batch/Lot # <b>HU1H 75748</b>	
Thinner: <b>T- 10</b>		Batch/Lot# <b>PG2032UH</b>	Thinner used: <b>5%</b>
Induction: <b>15 MIN.</b>	Pump Size: <b>70:1</b>	Heater/Setting: <b>0</b>	Tip Size: <b>313</b>
<b>COATING INSPECTION</b>		INSPECTED PIECES: <b>7</b>	
Appearance: <b>SMOOTH &amp; UNIFORM</b>		Coating Defects: <b>NONE</b>	Location: <b>N/A</b>
Repairs Required: <b>NONE</b>			
Repair Material: <b>N/A</b>		Base Batch # <b>N/A</b>	Cat. Batch # <b>N/A</b>
Repairs Accepted? <b>N/A</b>			
<b>INSPECTION: DRY FILM THICKNESS</b>			
Gauge Type & S/N: <b>ELEKTRO PHYSIK</b>		Calibrated This Day? <b>YES</b>	
Location	Average	High	Low
<b>COMPLETE EXT.</b>	<b>3.3 MILS</b>	<b>5.5 MILS</b>	<b>1.7 MILS</b>
<b>COMMENTS: EXTERNAL PRIMER WAS FOUND TO BE ACCEPTABLE.</b>			
Project inspected and acceptable to meet specification? <b>YES</b>			
 QC MANAGER - B. ROBBIARD		 3RD PARTY INSPECTOR	
Date: <b>DECEMBER 31, 2013</b>			



PennWest c/o Pioneer Engineering  
TCTI Job# 13554-V  
P.O. # PEI-A13370744-04  
LSD: d-55-A/94-P-10  
Jan. 2014

**10.0 Secondary Containment Pan Blast Profile Report**

**TORNADO Combustion Technologies Inc.**  
#200 261200 Wagon Wheel Way  
Md of Rockyview, AB T4A 0E3  
Ph 403-244-3333  
Fax 403-275-3740



Aug 2.4 Mils



PennWest c/o Pioneer Engineering  
TCTI Job# 13554-V  
P.O. # PEI-A13370744-04  
LSD: d-55-A/94-P-10  
Jan. 2014

**11.0 Secondary Containment Pan Paint Report**

**TORNADO Combustion Technologies Inc.**  
#200 261200 Wagon Wheel Way  
Md of Rockyview, AB T4A 0E3  
Ph 403-244-3333  
Fax 403-275-3740





TORNADO COMBUSTION TECHNOLOGIES INC.

# EXTERNAL COATING TRAVEL SHEET

CUSTOMER NAME PennWest c/o Pioneer Engineering  
 CUSTOMER REFERENCE # P.O.#  
 TORNADO REFERENCE # TCTI- 13554  
 INSPECTOR In House Q.C.  
 DESCRIPTION 5'-0" Dia. x 10'-0" S/S A.G.K.O. Containment Pan

**- EXTERNAL SURFACE PREPERATION -**

AREA BLASTED	BLAST GRADE	BLAST MEDIUM	TIME	SURFACE TEMP	AMBIENT TEMP	R.H.%	DEW POINT	ACTUAL TESTEX PROFILE	MFG. Recommended Blast Profile
Complete Exterior Secondary Containment Pan	SSPC 6	Sil 4	11:00	-11°C	-11*	34%	-3°C	2.4 Mills Avg.	1.5-2.5 Mills

COMMENTS:

RELEASED BY: \_\_\_\_\_ DATE: 30-Dec-13  
 IN HOUSE QC (Signature) *Andrew Lide*  
 INSPECTOR (Signature) \_\_\_\_\_ DATE: \_\_\_\_\_

**- EXTERNAL COATING -**

COAT NO. 1	COATING MANUFACTURER & TYPE	MFG Recommended		COLOUR	BASE BATCH	Number of DFT Readings			SUR. TEMP.	AMB. TEMP.	R.H.%
		Wet Film	DFT			Wet Film	MIN. DFT	MAX. DFT			
	Devoe Cathacoat 302H	4-6	2.5-4	Green	PE9950UH	5	2	4.8	3.5	26°C	26%
	APPLICATION METHOD	% Solid	% Thinner	THINNER	AMOUNT USED	TIP SIZE	INDUCTION TIME	PUMP SIZE	DATE	INITIALS	
	Airless	78%	10%	T-10	3 Gallons	3/7	15 Minutes	56:1	30-Dec-13	A.C.	

COAT # 1 - COMMENTS:

COAT NO. 2	COATING MANUFACTURER & TYPE	MFG Recommended		COLOUR	BASE BATCH	Number of DFT Readings			SUR. TEMP.	AMB. TEMP.	R.H.%
		Wet Film	DFT			Wet Film	MIN. DFT	MAX. DFT			
	Cloverdale Armourshield	3-6	2-4	F-34 Warm Grey	W13D6192	5	3.1	4.1	3.5	17°C	26%
	APPLICATION METHOD	% Solid	% Thinner	THINNER	AMOUNT USED	TIP SIZE	INDUCTION TIME	PUMP SIZE	DATE	INITIALS	
	Airless	70%	5%	C-760	3 Gallons	4/1	N/A	56:1	31-Dec-13	A.C.	

COAT # 2 - COMMENTS:

COAT NO. 3	COATING MANUFACTURER & TYPE	MFG Recommended		COLOUR	BASE BATCH	Number of DFT Readings			SUR. TEMP.	AMB. TEMP.	R.H.%
		Wet Film	DFT			Wet Film	MIN. DFT	MAX. DFT			
	APPLICATION METHOD	% Solid	% Thinner	THINNER	AMOUNT USED	TIP SIZE	INDUCTION TIME	PUMP SIZE	DATE	INITIALS	

COAT # 3 - COMMENTS:

COAT NO. 4	COATING MANUFACTURER & TYPE	MFG Recommended		COLOUR	BASE BATCH	Number of DFT Readings			SUR. TEMP.	AMB. TEMP.	R.H.%
		Wet Film	DFT			Wet Film	MIN. DFT	MAX. DFT			
	APPLICATION METHOD	% Solid	% Thinner	THINNER	AMOUNT USED	TIP SIZE	INDUCTION TIME	PUMP SIZE	DATE	INITIALS	

COAT # 4 - COMMENTS:

RELEASED BY: \_\_\_\_\_ DATE: 02-Jan-14  
 IN-HOUSE QC (Signature) *Andrew Lide*  
 INSPECTOR (Signature) \_\_\_\_\_ DATE: \_\_\_\_\_

PROJECT COMMENTS:



PennWest c/o Pioneer Engineering

TCTI Job# 13554-V

P.O. # PEI-A13370744-04

LSD: d-55-A/94-P-10

Jan. 2014

**12.0 Nameplate Photograph**

**TORNADO Combustion Technologies Inc.**  
#200 261200 Wagon Wheel Way  
Md of Rockyview, AB T4A 0E3  
Ph 403-244-3333  
Fax 403-275-3740

VESSEL TYPE: HORIZONTAL AGKO

JOB No/S/N: 13554-V

CONN. SIZE: 12 IN.

S/S LENGTH: 10 FT.

O.D.: 5 FT.

MATERIAL: SA 516-70M

CUSTOMER P.O.: PET-A13370744-04

TAG No:

MAWP: 14.7 PSIG

FOR MORE INFORMATION REFER TO S/N

TORNADO Combustion Technologies Inc.



403-244-3333

Calgary, AB., Canada



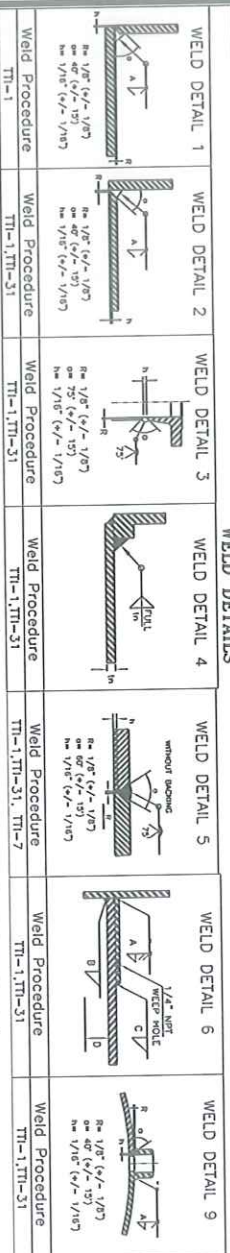
PennWest c/o Pioneer Engineering  
TCTI Job# 13554-V  
P.O. # PEI-A13370744-04  
LSD: d-55-A/94-P-10  
Jan. 2014

**13.0 As Built Drawings**

**TORNADO Combustion Technologies Inc.**  
#200 261200 Wagon Wheel Way  
Md of Rockyview, AB T4A 0E3  
Ph 403-244-3333  
Fax 403-275-3740

NOZZLE, COUPLING & MANWAY SCHEDULE

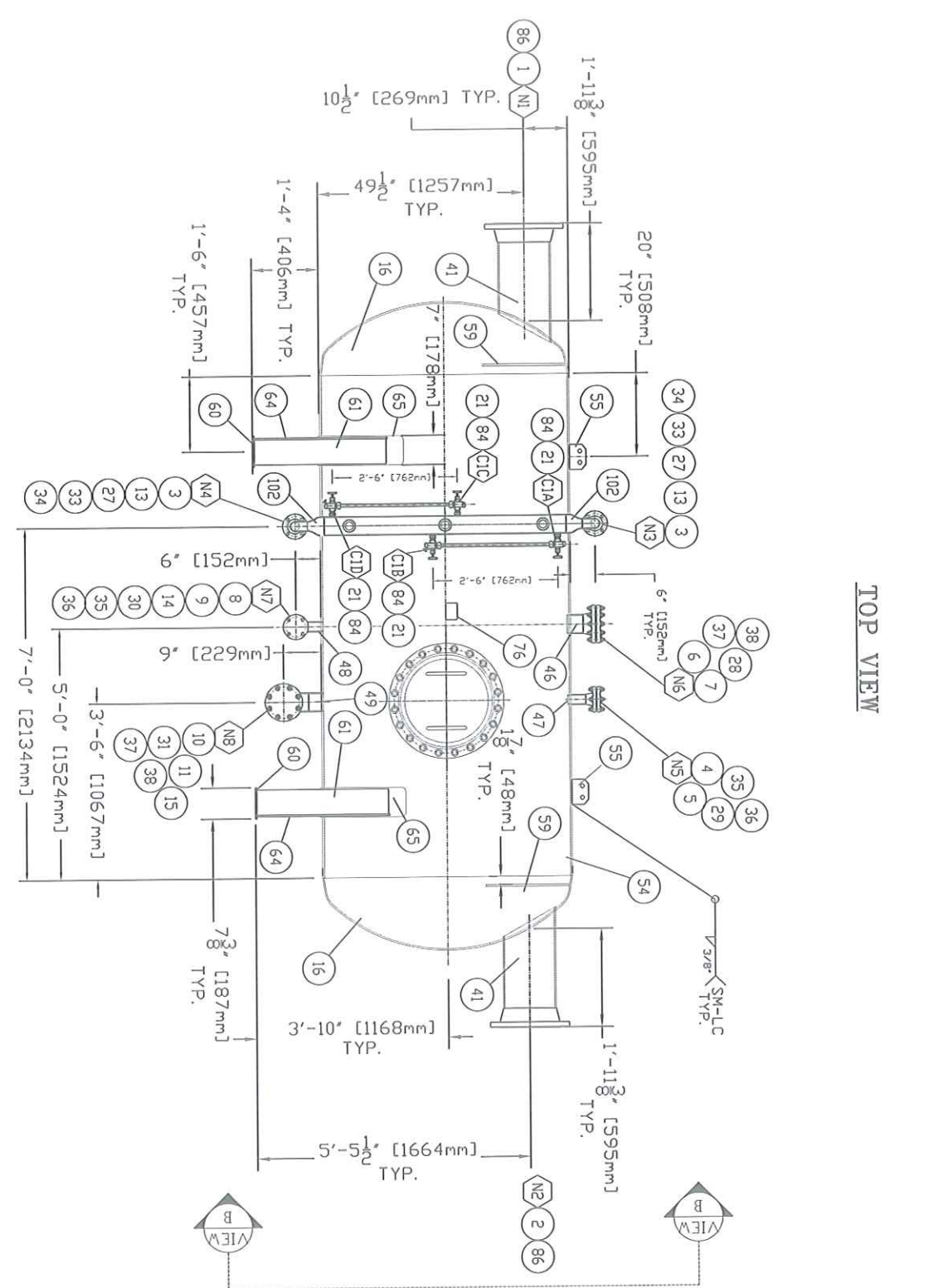
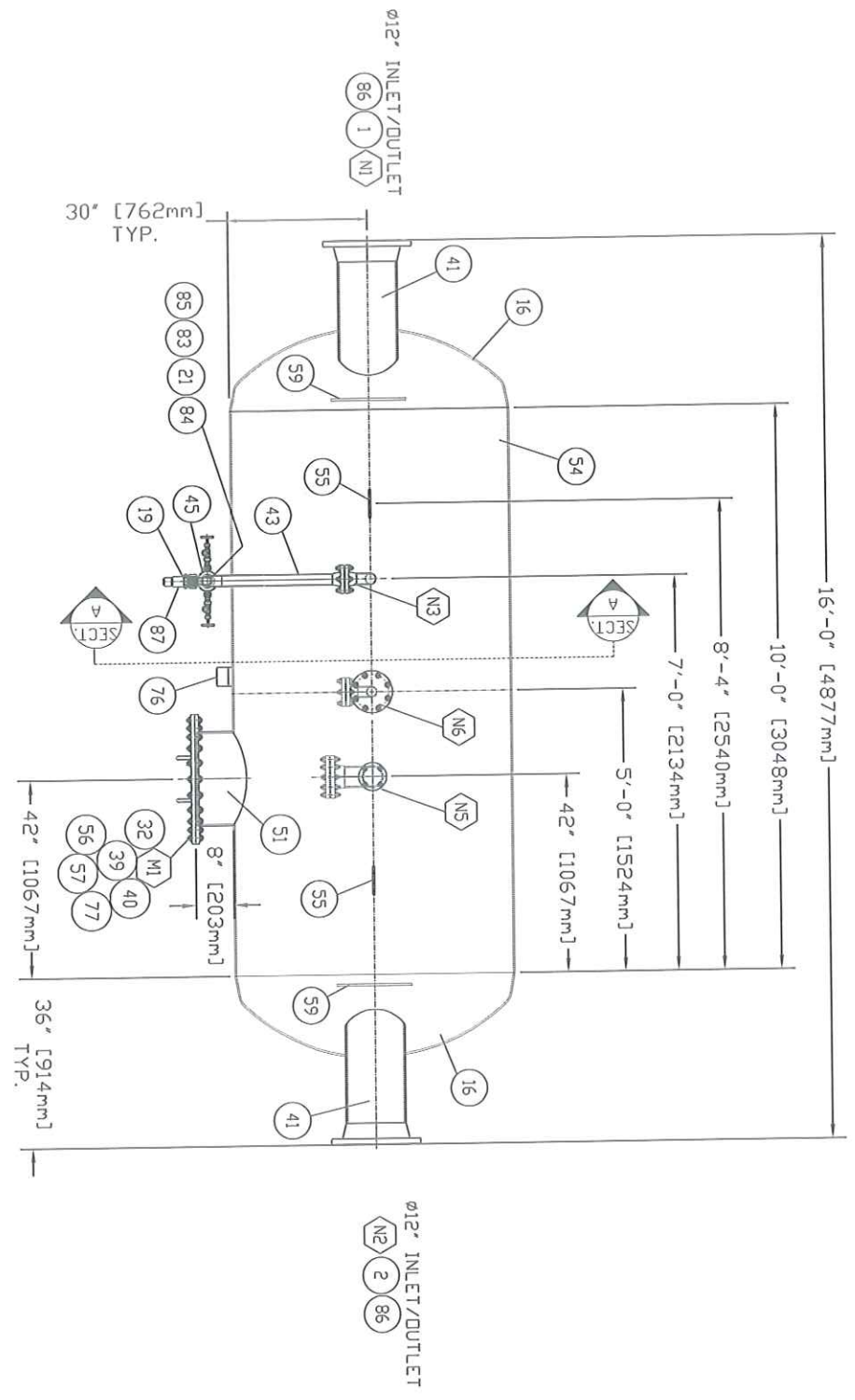
Work No.	Qty.	Size	Material	Rating	Service	Protection	Welding	Finel. Weld Size	Description	Erection	Orientation
						Inside Diameter	Detail Number	A B C D			Angle
N1	1	ø12 [323.9mm]	SA 105N	150#	INLET/OUTLET CONNECTION	1/2" [25.375]	2.3	1/4"	R.F. WELD NECK	5'-5 1/2" [1684mm]	END
N2	1	ø12 [323.9mm]	SA 105N	150#	INLET/OUTLET CONNECTION	1/2" [25.375]	2.3	1/4"	R.F. WELD NECK	5'-5 1/2" [1684mm]	END
N3	1	ø2 [60.3mm]	SA 105N	150#	FLOAT BRIDE CONNECTION	0"	2.3	1/4"	R.F. WELD NECK	6'-0" [1829mm]	TOP
N4	1	ø2 [60.3mm]	SA 105N	150#	FLOAT BRIDE CONNECTION	0"	2.3	1/4"	R.F. WELD NECK	10' [254mm]	BOTTOM
N5	1	ø2 [60.3mm]	SA 105N	150#	VENT CONNECTION	1/2"	6"	2.3	R.F. WELD NECK	SEE DRAWING	TOP
N6	1	ø4 [114.3mm]	SA 105N	150#	SPARE CONNECTION	1/2"	6"	2.3	R.F. WELD NECK	SEE DRAWING	TOP
N7	1	ø4 [114.3mm]	SA 105N	150#	DRAIN CONNECTION	0"	6"	2.3	R.F. WELD NECK	10' [254mm]	BOTTOM
N8	1	ø4 [114.3mm]	SA 105N	150#	TRUCKOUT CONNECTION	0"	9"	2.3	R.F. WELD NECK	SEE DRAWING	BOTTOM
C1A-D	4	ø1/2 [12.7mm]	SA 105N	3000#	SIGHT GLASS CONNECTIONS	0"	0"	9	HALF COUPLINGS	SEE DRAWING	BRIDE
C2A/C	3	ø2 [60.3mm]	SA 105N	3000#	LEVEL SWITCH CONNECTIONS	0"	0"	2.3	HALF COUPLINGS	SEE DRAWING	BRIDE
C3	1	ø1/2 [12.7mm]	SA 105N	150#	FLOAT BRIDE DRAIN	0"	0"	1/4"	ELBOWLET	SEE DRAWING	BRIDE
M1	1	ø20 [508mm]	SA 36 CS	FAB.	INSPECTION MANWAY	1/2"	8"	4	FAB. FLANGE	3'-10" [1168mm]	SIDE



**NDT Notes:**

% Of Radiography On Vessel Welds:	0%
Impact Testing:	NONE
Magnetic Particle Testing Of All Lifting Attachments & Gussets:	NONE
Ultra Sonic Testing:	NONE
Dye Penetrant:	NONE

**NOTE:**  
INTEGRAL KNOCKOUT INTERIOR IS TO BE SANDBLASTED TO SSPC-SP10 AND COATED WITH 10-18 mils OF DEVDE 253 COATING.



SIDE VIEW

TOP VIEW

Rev.	Description	By	Y	M	D
2	AS BUILT	AL	14	01	16
1	ISSUED FOR CONSTRUCTION	HW	13	10	29
0	ISSUED FOR APPROVAL PURPOSES	HW	13	07	17

**General Notes:**  
1) MTRS PROVIDED ON REQUEST AND RECEIPT OF ORDER.

**Coating & Preparation:**  
1) VESSEL EXTERIOR, SANDBLAST: SSPC-SP6 PRIMER: DEVDE CATHACDAT 302H, 2.5-4.0 mils DFT TOPCOAT: CLOVERDALE ARMOURSHIELD 2-3 mils DFT WARM GREY  
2) VESSEL INTERIOR, SANDBLAST: SSPC-SP10 INTERNAL COATING: DEVDE 253, 10-18 mils

**Fabrication Tolerances \***  
Fractional: ø0" to ø24" ±1/8" Greater than ø24" ±1/4"  
Decimal: ø0" to ø24" ±1/8" Greater than ø24" ±1/4"  
Angular: All ±2"  
\*Unless otherwise stated

Name of Plant:	-
Lease:	-
Weight - Total Combined:	6,700 LBS.
Weight - Vessel Only:	4,200 LBS.
Weight - Skid & Building:	2,500 LBS.
Design Pressure:	14.7 PSig
Hydrotest Pressure:	22 PSig
Max. Operating Pressure:	14.7 PSig
Design Code:	NBC 2010
Weld Procedure:	#13232
APEGGA Permit To Practice:	#P10806
CWB Registration Number:	TDRNG1

Drawing Number:	PENNWEST-13554-GA(1)
Drawn By:	HW
Checked By:	EW
Date Drawn:	JULY/17/13
Job Number:	13554
Quote Number:	-
Tag Number:	-
Size Of Vessel in Barrels:	50 BBL.S.
Corrosion Allowance:	-

**Title:**  
ø5'-0" O.D X 10'-0" LG. S.S. AG.K.D TANK (50 bbl.) C/W ø12" INLET/OUTLET CONN.

**Customer:**  
PENNWEST C/O PIONEER ENGINEERING

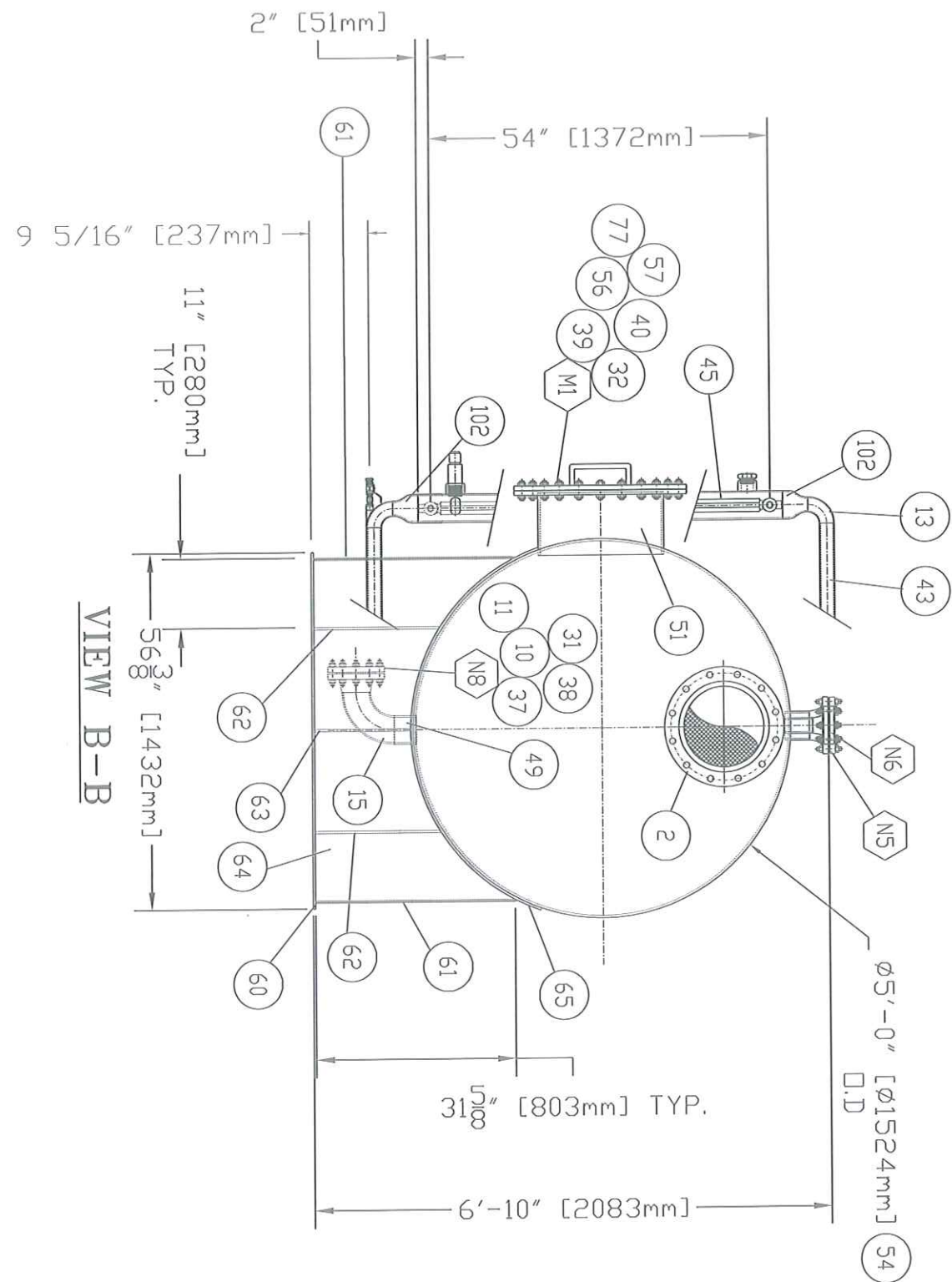
**P.O.#:**  
-

**Salesperson:**  
SAMUEL BATTS

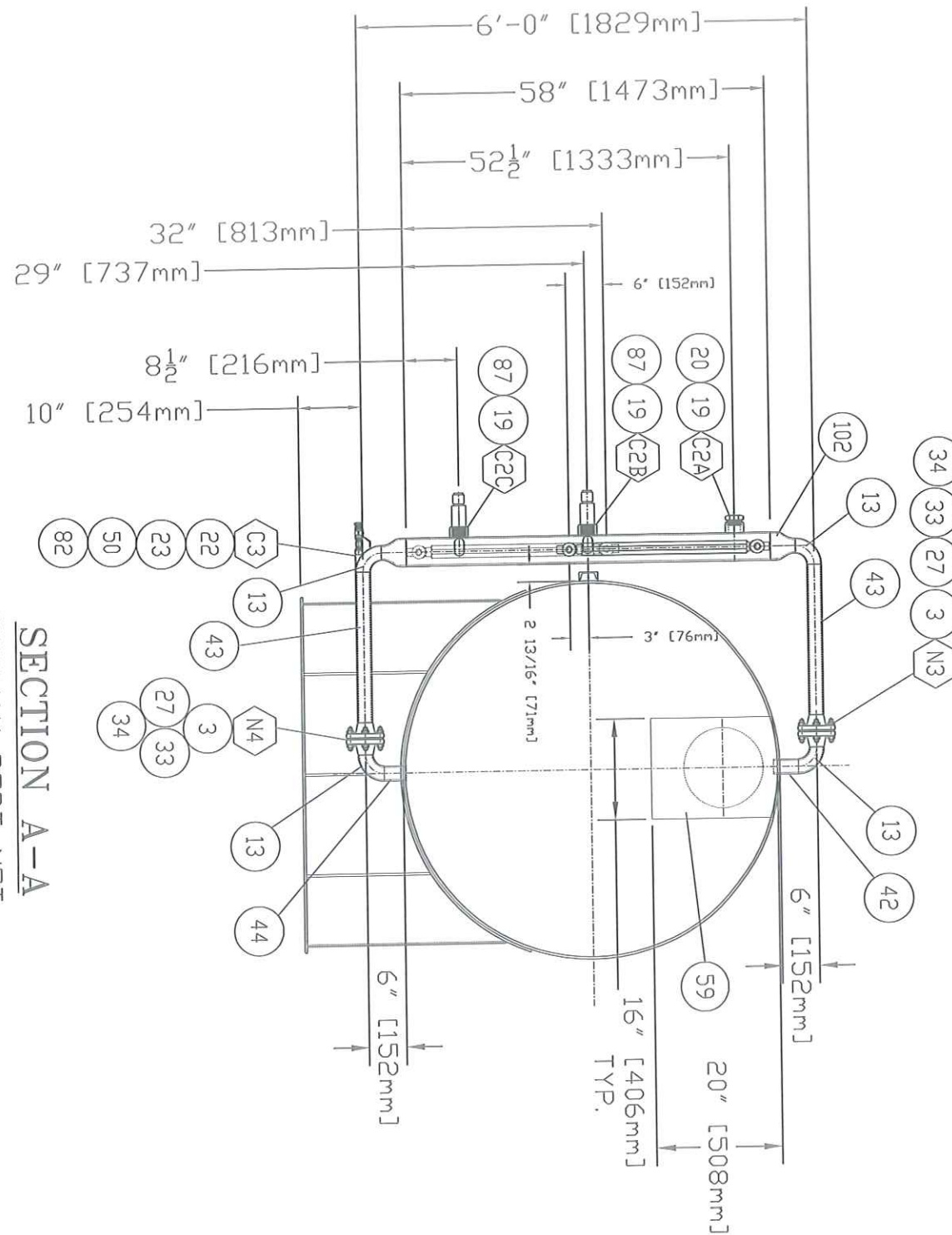
Sheet 1 of 3

TORNADO COMBUSTION TECHNOLOGIES INC.  
1-888-882-3882

Any Technical Data and the Designs Disclosed Herein are the Exclusive Property of Tornado Technologies Inc. and/or Contained the Proprietary Rights of Others and are not to be used or Disclosed to Others without the Written Consent of Tornado Technologies Inc.



SECTION A-A  
MANWAY PORT NOT  
SHOWN IN THIS VIEW.



Rev.	Description	By	Y	M	D
2	AS BUILT	AL	14	01	16
1	ISSUED FOR CONSTRUCTION	HW	13	10	29
0	ISSUED FOR APPROVAL PURPOSES	HW	13	07	17

**General Notes:**  
1) MTRS PROVIDED ON REQUEST AND RECEIPT OF ORDER.

**Coating & Preparation:**  
1) VESSEL EXTERIOR:  
SANDBLAST: SSPC-SP6  
PRIMER: DEVCO CATHACDAT 302H, 2.5-4.0 mils DFT  
TOPCOAT: CLOVERDALE ARMOURSHIELD  
2-3 mils DFT WARM GREY  
2) VESSEL INTERIOR:  
SANDBLAST: SSPC-SP10  
INTERNAL COATING: DEVCO 253, 10-18 mils

**Fabrication Tolerances \***  
Fractional:  
ø0" to ø24" ±1/8"  
Greater than ø24" ±1/4"  
Decimal:  
ø0" to ø24" ±1/8"  
Greater than ø24" ±1/4"  
Angular:  
All ±2"  
\*Unless otherwise stated

Name of Plant:	-
Lease:	-
Weight - Total Combined:	6,700 LBS.
Weight - Vessel Only:	4,200 LBS.
Weight - Skid & Building:	2,500 LBS.
Design Pressure:	14.7 PSIG
Hydrotest Pressure:	22 PSIG
Max. Operating Pressure:	14.7 PSIG
Design Code:	NBC 2010
Weld Procedure:	#13232
APEGGA Permit To Practice:	#P10806
CWB Registration Number:	TORNG1

Drawing Number:	PENNWEST-13554-GA(2)
Drawn By:	HW
Checked By:	EW
Date Drawn:	JULY/17/13
Job Number:	13554
Quote Number:	-
Tag Number:	-
Size Of Vessel in Barrels:	50 BBL.S.
Corrosion Allowance:	-

**Title:**  
ø5'-0" O.D X 10'-0" LG. S.S.  
A.G.K.D TANK (50 BBL.)  
C/W ø12" INLET/OUTLET CONN.

**Customer:**  
PENNWEST C/O  
PIONEER ENGINEERING

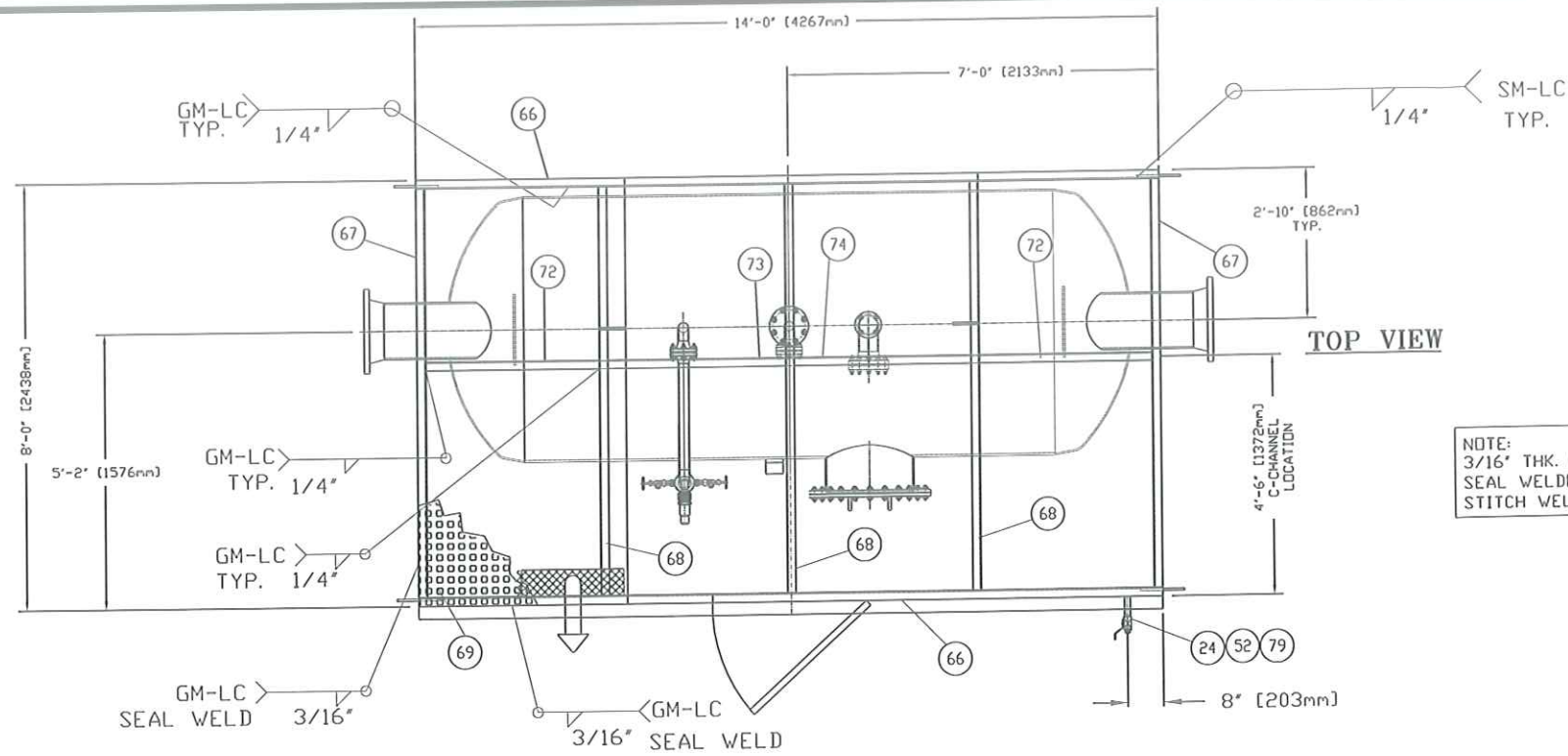
**P.O.#:**  
-

**Salesperson:**  
SAMUEL BATTIS

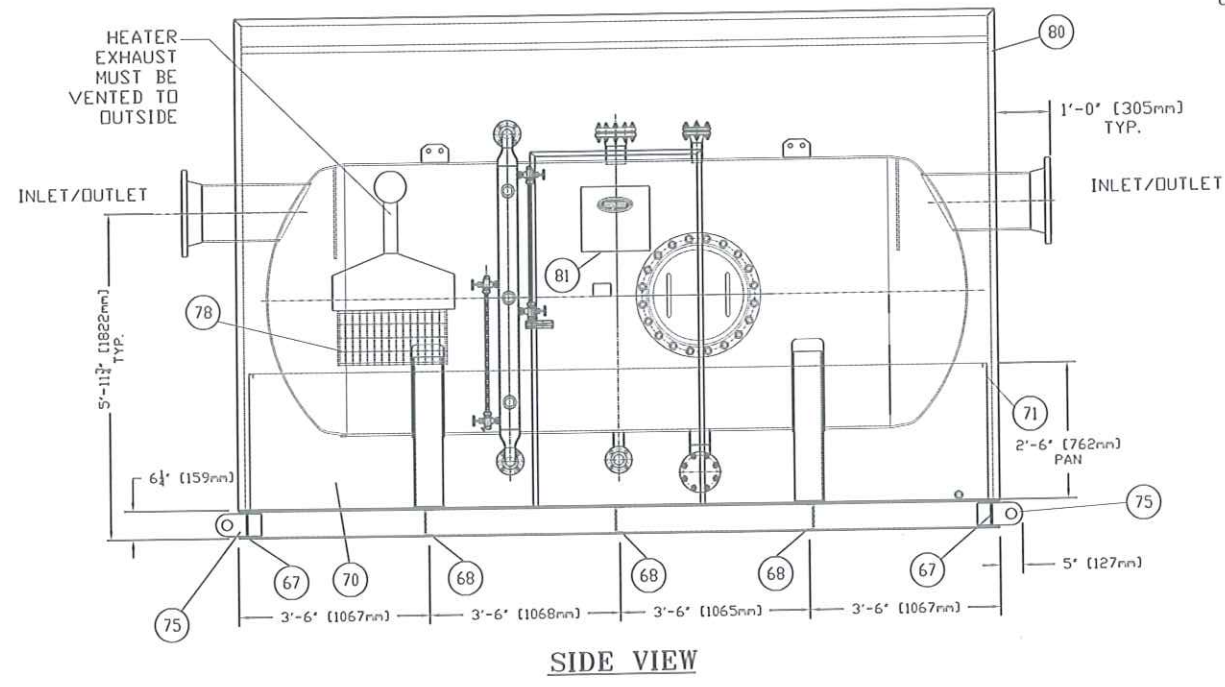
Sheet 2 of 3

**TORNADO COMBUSTION TECHNOLOGIES INC.**  
1-888-882-3882

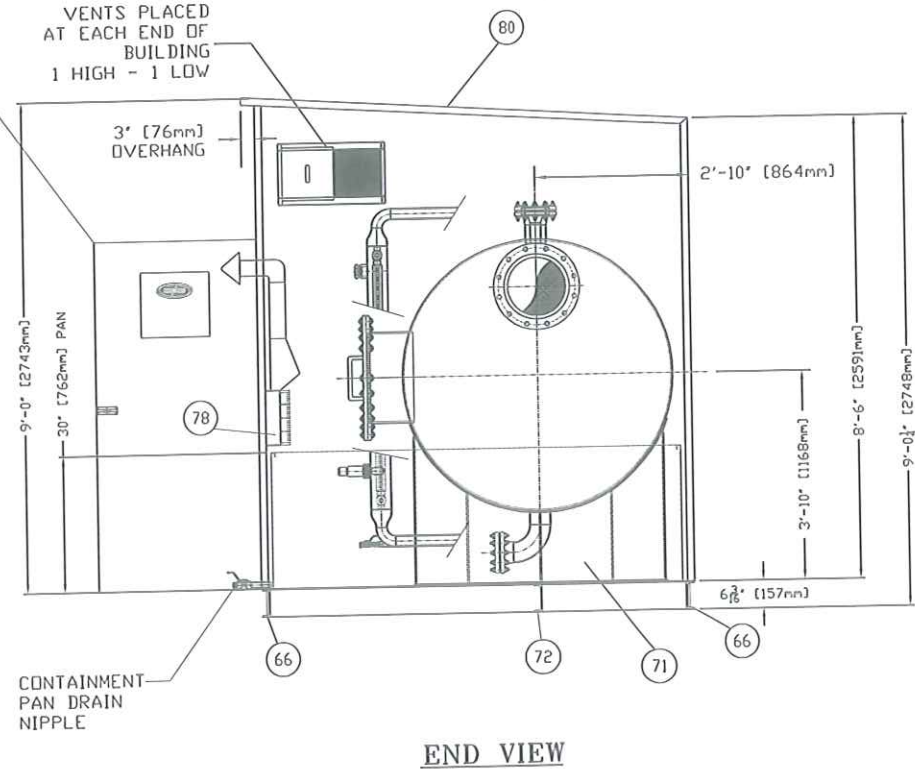
Any Technical Data and the Designs Disclosed Herein are the Exclusive Property of Tornado Technologies Inc. and/or Contained the Proprietary Rights of Others and are not to be used or Disclosed to Others without the Written Consent of Tornado Technologies Inc.



NOTE:  
3/16" THK. CHECKER PLATE  
SEAL WELDED ON TOP  
STITCH WELDED BELOW



3'-0" x 6'-10" R.H. DOOR  
C/W 6" DEADBOLT, CHECK  
CHAIN, BUTT HINGE,  
WEATHERSTRIPPING &  
ALUMINUM THRESHOLD  
SWEEP.



Rev.	Description	By	Y	M	D
2	AS BUILT	AL	14	01	16
1	ISSUED FOR CONSTRUCTION	HW	13	10	29
0	ISSUED FOR APPROVAL PURPOSES	HW	13	07	17

**General Notes:**  
1) MTRS PROVIDED ON REQUEST AND RECEIPT OF ORDER

**Coating & Preparation:**  
1) VESSEL EXTERIOR:  
SANDBLAST: SSPC-SP6  
PRIMER: DEVDE CATHACDAT 302H, 2.5-4.0 mils DFT  
TOPCOAT: CLOVERDALE ARMOURSHIELD  
2-3 mils DFT WARM GREY  
2) VESSEL INTERIOR:  
SANDBLAST: SSPC-SP10  
INTERNAL COATING: DEVDE 253, 10-18 mils

**Fabrication Tolerances \***  
Fractional:  
ø0" to ø24" ±1/8"  
Greater than ø24" ±1/4"  
Decimal:  
ø0" to ø24" ±1/8"  
Greater than ø24" ±1/4"  
Angular:  
All ±2"  
\*Unless otherwise stated

Name of Plant:	-
Lease:	-
Weight - Total Combined:	6,700 LBS.
Weight - Vessel Only:	4,200 LBS.
Weight - Skid & Building:	2,500 LBS.
Design Pressure:	14.7 PSIG
Hydrotest Pressure:	22 PSIG
Max. Operating Pressure:	14.7 PSIG
Design Code:	NBC 2010
Weld Procedure:	#1323.2
APEGGA Permit To Practice:	#P10806
CWB Registration Number:	TORNG1

Drawing Number:	PENNWEST-13554-GA(3)
Drawn By:	HW
Checked By:	EW
Date Drawn:	JULY/17/13
Job Number:	13554
Quote Number:	-
Tag Number:	-
Size Of Vessel in Barrels:	50 BBLs.
Corrosion Allowance:	-

**Title:**  
ø5'-0" O.D X 10'-0" LG. S.S.  
A.G.K.D TANK (50 bbl.)  
C/W ø12" INLET/OUTLET CONN

**Customer:**  
PENNWEST C/O  
PIONEER ENGINEERING

**P.O.#:**  
-

**Salesperson:**  
SAMUEL BATTS

Sheet 3 of 3

**TORNADO COMBUSTION TECHNOLOGIES INC.**  
1-888-882-3882

Any Technical Data and the Designs Disclosed Herein are the Exclusive Property of Tornado Technologies Inc. and/or Contained the Proprietary Rights of Others and are not to be used or Disclosed to Others without the Written Consent of Tornado Technologies Inc.

### Bill of Materials

					Description	Heat Number
Flanges	No.	Part Number	Qty.	Units		
	1	FLG-0160	1	EA	12" DIA, SCH STD, 150#, RFWN, ANSI B16.5 SA 105N ( N1 - INLET/OUTLET CONNECTION)	13271
	2	FLG-0160	1	EA	12" DIA, SCH STD, 150#, RFWN, ANSI B16.5 SA 105N ( N2 - INLET/OUTLET CONNECTION)	12/34863
	3	FLG-0019	4	EA	2" DIA, SCH 80, 150#, RFWN, ANSI B16.5 SA 105N ( N3/4 - FLOAT BRIDLE CONNECTIONS)	A87T3
	4	FLG-0019	1	EA	2" DIA, SCH 80, 150#, RFWN, ANSI B16.5 SA 105N ( N5 - VENT CONNECTION)	11/38305
	5	FLG-0079	1	EA	2" DIA, N/A, 150#, RF BLIND, ANSI B16.5 SA 105N ( N5 - VENT CONNECTION BLIND)	08/75402
	6	FLG-0118	1	EA	4" DIA, SCH STD, 150#, RFWN, ANSI B16.5 SA 105N ( N6 - SPARE CONNECTION)	13/76392
	7	FLG-0065	1	EA	4" DIA, N/A, 150#, RF BLIND, ANSI B16.5 SA 105N ( N6 - SPARE CONNECTION BLIND)	12/34986
	8	FLG-0019	1	EA	2" DIA, SCH 80, 150#, RFWN, ANSI B16.5 SA 105N ( N7 - DRAIN CONNECTION)	12/72669
	9	FLG-0079	1	EA	2" DIA, N/A, 150#, RF BLIND, ANSI B16.5 SA 105N ( N7 - DRAIN CONNECTION BLIND)	08/75402
	10	FLG-0118	1	EA	4" DIA, SCH STD, 150#, RFWN, ANSI B16.5 SA 105N ( N8 - TRUCKOUT CONNECTION)	13/76392
	11	FLG-0065	1	EA	4" DIA, N/A, 150#, RF BLIND, ANSI B16.5 SA 105N ( N8 - TRUCKOUT CONNECTION BLIND)	12/34986
12						
Weld Fittings	No.	Part Number	Qty.	Units	Description	Heat Number
	13	PFB-0019	4	EA	2" DIA, SCH 80, 90 DEGREE, SA 234 WPB WELD ELBOW (N3/4 - FLOAT BRIDLE WELD ELBOWS)	12F00018
	14	PFB-0019	1	EA	2" DIA, SCH 80, 90 DEGREE, SA 234 WPB WELD ELBOW (N7 - DRAIN CONNECTION WELD ELBOW)	12F00018
	15	PFB-0034	1	EA	4" DIA, SCH STD, 90 DEGREE, SA 234 WPB WELD ELBOW ( N8 - TRUCKOUT CONNECTION WELD ELBOW)	11H00067
	16	VES-0055	2	EA	5'-0" O.D, 3/8" THK, 2:1 S.E, SA516 GR70 VESSEL HEADS (30 DEGREE OUTSIDE BEVEL, NO LAND)	G8924-874720280
	17					G9690-5702702341
	18					
Couplings	No.	Part Number	Qty.	Units	Description	Heat Number
	19	PFT-0186	3	EA	2" DIA 3000#, NPT, SA 105 HALF COUPLING (C2A-C - LEVEL SWITCH CONNECTIONS)	K88, 3861
	20	PFT-0173	1	EA	2" DIA, 3000/6000#, SA 105N HEX HEAD PLUG, THREADED ( C2A - LEVEL SWITCH CONNECTION)	3065
	21	PFT-0227	4	EA	1/2" DIA 3000#, NPT, SA 105 HALF COUPLING (C1A-D - SIGHT GLASS CONNECTIONS)	3430, 79144
	22	PFB-0038	1	EA	1/2" DIA 3000#, NPT, SA 105N ELBOWLET ( C3 - FLOAT BRIDLE DRAIN CONNECTION)	57618
	23	PFT-0158	1	EA	1/2" DIA, 3000/6000#, SA 105N HEX HEAD PLUG, THREADED ( C3 - FLOAT BRIDLE DRAIN CONNECTION)	3334
	24	PFT-0174	1	EA	1" DIA 3000#, NPT SA 105 HEX HEAD PLUG (SKID DRAIN NIPPLE PLUG)	3715
25						
26						
Gaskets	No.	Part Number	Qty.	Units	Description	Heat Number
	27	SNG-0122	2	EA	2" DIA X 1/8" THK, 150#, 316L S.S. FLEXI-CARB GASKET (N3/4 - FLOAT BRIDLE CONNECTION GASKETS)	
	28	SNG-0135	1	EA	4" DIA X 1/8" THK, 150#, 316L S.S. FLEXI-CARB GASKET (N6 - SPARE CONNECTION GASKET)	
	29	SNG-0122	1	EA	2" DIA X 1/8" THK, 150#, 316L S.S. FLEXI-CARB GASKET (N5 - VENT CONNECTION GASKET)	
	30	SNG-0122	1	EA	2" DIA X 1/8" THK, 150#, 316L S.S. FLEXI-CARB GASKET (N7 - DRAIN CONNECTION GASKET)	
	31	SNG-0135	1	EA	4" DIA X 1/8" THK, 150#, 316L S.S. FLEXI-CARB GASKET (N8 - TRUCKOUT CONNECTION GASKET)	
	32	SNG-0268	1	EA	20" DIA O.D X 1/8" THK. NEOPRENE GASKET ( M1 - MANWAY GASKET)	
Studs & Nuts	No.	Part Number	Qty.	Units	Description	Heat Number
	33	SNG-0123	8	EA	5/8" DIA X 3 1/2" LONG SA193 B7M STUDS ( N3/4 - FLOAT BRIDLE CONNECTION STUDS)	
	34	SNG-0108	16	EA	5/8" DIA SA194 2HM NUTS ( N3/4 - FLOAT BRIDLE CONNECTION NUTS)	
	35	SNG-0123	8	EA	5/8" DIA X 3 1/2" LONG SA193 B7M STUDS ( N5/7 - VENT/DRAIN CONNECTION STUDS)	
	36	SNG-0108	16	EA	5/8" DIA SA194 2HM NUTS ( N5/7 - VENT/DRAIN CONNECTION NUTS)	
	37	SNG-0123	16	EA	5/8" DIA X 3 1/2" LONG SA193 B7M STUDS ( N6/8 - SPARE/TRUCKOUT CONNECTION STUDS)	
	38	SNG-0108	32	EA	5/8" DIA SA194 2HM NUTS ( N6/8 - SPARE/TRUCKOUT CONNECTION NUTS)	
	39	SNG-0231	20	EA	3/4" DIA X 3 1/2" LONG SA193 B7M STUDS ( M1 - MANWAY CONNECTION STUDS)	
	40	SNG-0104	40	EA	3/4" DIA SA194 2HM NUTS ( M1 - MANWAY CONNECTION NUTS)	
	41					
Pipe	No.	Part Number	Qty.	Units	Description	Heat Number
	41	PIPE-0080	1	EA	12" DIA, SCH STD, SMLS, SA 106B PIPE X 2'-1/8" LONG ( N1/2 - INLET/OUTLET EXTENSIONS)	1333415
	42	PIPE-0030	1	EA	2" DIA, SCH 80, SMLS, SA 106B PIPE X 4" LONG ( N3 - UPPER FLOAT BRIDLE EXTENSION)	12228185
	43	PIPE-0030	2	EA	2" DIA, SCH 80, SMLS, SA 106B PIPE X 2'-0" LONG ( N3/4 - UPPER/LOWER FLOAT BRIDLE PIPES)	12228185
	44	PIPE-0030	1	EA	2" DIA, SCH 80, SMLS, SA 106B PIPE X 3 1/2" LONG ( N4 - LOWER FLOAT BRIDLE EXTENSION)	12228185
	45	PIPE-0052	1	EA	4" DIA, SCH STD, SMLS, SA 106B PIPE X 4'-10" LONG ( FLOAT BRIDLE CONTAINER)	10708253
	46	PIPE-0052	1	EA	4" DIA, SCH STD, SMLS, SA 106B PIPE X 3 7/8" LONG ( N6 - SPARE CONNECTION EXTENSION)	10708253
	47	PIPE-0030	1	EA	2" DIA, SCH 80, SMLS, SA 106B PIPE X 4 1/2" LONG ( N5 - VENT CONNECTION EXTENSION)	12228185
	48	PIPE-0030	1	EA	2" DIA, SCH 80, SMLS, SA 106B PIPE X 3 1/2" LONG ( N7 - DRAIN CONNECTION EXTENSION)	12228185
	49	PIPE-0052	1	EA	4" DIA, SCH STD, SMLS, SA 106B PIPE X 3 1/2" LONG ( N8 - TRUCKOUT CONNECTION EXTENSION)	10708253
	50	PFT-0245	1	EA	1/2" DIA SCH 80, SMLS, SA 106B PIPE X 2" LONG, T.B.E (C3 - FLOAT BRIDLE DRAIN NIPPLE)	
	51	PIPE-0033	1	EA	20" DIA, SCH STD, SMLS, SA 106B PIPE X 9 7/8" LONG (M1 - MANWAY INLET EXTENSION)	BSM-1086
52	PIPE-0003	1	EA	1" DIA SCH STD, SMLS SA 106 B PIPE X 7" LONG T.O.E (DRAIN NIPPLE)		
53						

					Description	Heat Number	
Plate	No.	Part Number	Qty.	Units			
	54		1	EA	3/8" THK SA 516 GR70 PLATE, ROLLED TO 5'-0" O.D X 10'-0" LONG ( KNOCKOUT SHELL)	58396	
	55	VES-0062	2	EA	6" X 4" X 1/2" THK SA 36 CS PLATE (LIFTING LUGS)	6251769	
	56	FLG-0213	1	EA	3/4" THK SA 36 CS PLATE, FOR 20" DIA PIPE, K.O (M1 - MANWAY INLET FLANGE)	8351L	
	57	FLG-0214	1	EA	3/4" THK SA 36 CS PLATE, FOR 20" DIA PIPE, K.O (M1 - MANWAY INLET BLIND)	8315L	
	58						
	59		2	EA	20" LONG X 16" WIDE X 3/8" THK 316L S.S. PLATE ( INLET/OUTLET DEFLECTORS)	E39571	
	60		2	EA	3/8" THK, SA 36 CS PLATE, 56 3/8" LONG X 7-3/8" WIDE (VESSEL STAND BASES)	LFH9118	
	61		4	EA	3/8" THK, SA 36 CS PLATE, SEE DETAIL, 31.625" X 6" WIDE (VESSEL STAND END PLATES)	0166119	
	62		4	EA	3/8" THK, SA 36 CS, 19 3/4" LONG X 6" WIDE (VESSEL STAND STIFFENERS)	0166119	
	63		2	EA	3/8" THK, SA 36 CS, 15 1/4" LONG X 6" WIDE (VESSEL STAND STIFFENERS)	0166119	
	64		2	EA	3/8" THK, SA 36 CS, SEE DETAIL (VESSEL STAND SIDE COVERS)	R1729	
	65		2	EA	3/8" THK X 7" WIDE, SA 36 CS, SEE DETAIL (VESSEL SUPPORT REPADS)	A3F236	
	66	STM-0045	2	EA	C6 X 8.2 C-CHANNEL X 14'-0" LONG (SKID SIDE BEAMS)		
	67	STM-0045	2	EA	C6 X 8.2 C-CHANNEL X 7' - 8 1/8" LONG (SKID END BEAMS)		
	68	STM-0045	3	EA	C6 X 8.2 C-CHANNEL X 7' - 8 1/8" LONG (SKID CENTRE SUPPORT)		
	69	STM-0048	1	EA	3/16" THK, A 36/44W CHECKERPLATE, 8'-0" WIDE X 14'-0" LONG ( BUILDING FLOOR)		
	70		2	EA	1/8" THK SA 36 CS PLATE X 2' - 6" HIGH X 13' - 7" LONG (CONTAINMENT PAN FRONT/BACK)		
	71		2	EA	1/8" THK SA 36 CS PLATE X 2' - 6" HIGH X 7' - 6 3/4" LONG (CONTAINMENT PAN SIDES)		
	72	STM-0045	2	EA	C6 X 8.2 C-CHANNEL X 3'-3 1/8" LONG (SKID CENTRE SUPPORT)		
	73	STM-0045	1	EA	C6 X 8.2 C-CHANNEL X 3' - 5 7/8" LONG (SKID CENTRE SUPPORT)		
	74	STM-0045	1	EA	C6 X 8.2 C-CHANNEL X 3' - 7 3/8" LONG (SKID CENTRE SUPPORT)		
	75	SKID-0013	4	EA	10" X 5" X 1/2" THK SA 36 CS PLATE (LIFTING LUGS - K.O SKID)		
	76						
	Misc. Parts	No.	Part Number	Qty.	Units	Description	Heat Number
		76	FLS-0063	1	EA	5" LONG X 3" C-CHANNEL (NAMEPLATE BRACKET)	
77		BAR-0030	2	EA	3/4" DIA. ROD X 1'-9" LONG, BENT INTO U-SHAPE, W/3 1/2" LONG LEGS (MANWAY HANDLE)		
78			1	EA	CATADYNE (CC) FLAMELESS HEATER, 12" X 24", NATURAL GAS, 12 VDC START		
79		VBA-0001	1	EA	1" DIA NPT, 2000 PSI, NACE NAVCO MANUAL BALL VALVE (DRAIN BALL VALVE)		
80			1	EA	WHITE FINISHED THERMO-PANEL BUILDING KIT FOR SKIDDED 8'-0" X 14'-0" A.G.K.O (BUILDING)		
81		BLD-0053	1	EA	STICKER, "MANUFACTURED BY TORNADO COMBUSTION TECHNOLOGIES INC." USED ON BUILDINGS		
82		VBA-0022	1	EA	1/2" DIA NPT A105N NACE NAVCO BALL VALVE (C3-FLOAT BRIDLE DRAIN VALVE)		
83		LVG-0027	2	EA	5/8" DIA ACRYLIC SIGHT GLASS TUBE (SIGHT GLASS) 30" LONG		
84		LVG-0019	2	EA	PENBERTHY LEVEL GAGECOCK TWO VALVE SET #N7A (LEVEL GAUGE VALVES)		
85	BLD-0002	2	EA	28" LG. ALUMINUM C-CHANNEL SIGHT GLASS GUARD ( NOT DEPICTED)			
86	CONSUMABLE	2	EA	12" DIA, 150#, PLASTIC FLANGE COVER (NOT DEPICTED)			
87	VLC-0036	2	EA	2" DIA NPT FLOAT TYPE ELECTRIC LEVEL SWITCH ASSEMBLY SOR			
88							
89							
90							
91							
92							
93							
94							
95							
96							
97							
98							
99							
100							
101							
Ship Loose Parts	No.	Part Number	Qty.	Units	Description	Heat Number	
	102		2	EA	4" DIA X 2" DIA, NPS, SCH STD/80, SA 234 WPB (FLOAT BRIDLE CONC. REDUCERS)	56G20156	
	103						
	104						
	105						
	106						
	107						
Concentric Reducers	No.	Part Number	Qty.	Units	Description	Heat Number	
	102		2	EA	4" DIA X 2" DIA, NPS, SCH STD/80, SA 234 WPB (FLOAT BRIDLE CONC. REDUCERS)	56G20156	
	103						
	104						
	105						
	106						
	107						

Rev.	Description	By	Y	M	D
3	AS BUILT	AL	14	01	16
2	ISSUED FOR CONSTRUCTION	HW	13	10	29
1	REMOVED PART NUMBER FROM ITEM #61 THRU #64	DB	13	07	26
0	ISSUED FOR APPROVAL PURPOSES	HW	13	07	17

**General Notes:**  
 1) MTRS PROVIDED ON REQUEST AND RECEIPT OF ORDER.

**Coating & Preparation:**  
 1) VESSEL EXTERIOR:  
 SANDBLAST: SSPC-SP6  
 PRIMER: DEVDE CATHACDAT 302H, 2.5-4.0 mils DFT  
 TOPCOAT: CLOVERDALE ARMOURSHIELD 2-3 mils DFT WARM GREY  
 2) VESSEL INTERIOR:  
 SANDBLAST: SSPC-SP10  
 INTERNAL COATING: DEVDE 253, 10-18 mils

Fabrication Tolerances *	
Fractional:	
ø0" to ø24"	±1/8"
Greater than ø24"	±1/4"
Decimal:	
ø0" to ø24"	±1/8"
Greater than ø24"	±1/4"
Angular:	
All	±2°
*Unless otherwise stated	

Name of Plant:	-	Drawing Number:	PENNWEST-13554-BOM(1)
Lease:	-	Drawn By:	HW
Weight - Total Combined:	6,700 LBS.	Checked By:	EW
Weight - Vessel Only:	4,200 LBS.	Date Drawn:	JULY/17/13
Weight - Skid & Building:	2,500 LBS.	Job Number:	13554
Design Pressure:	14.7 PSIG	Quote Number:	-
Hydrotest Pressure:	22 PSIG	Tag Number:	-
Max. Operating Pressure:	14.7 PSIG	Size Of Vessel in Barrels:	50 BBLs.
Design Code:	NBC 2010	Corrosion Allowance:	-
Weld Procedure:	#1323.2		
APEGGA Permit To Practice:	#P10806		
CWB Registration Number:	TDRNGI		

Sheet 1 of 2

**TORNADO**

TORNADO COMBUSTION TECHNOLOGIES INC.  
1-888-882-3882

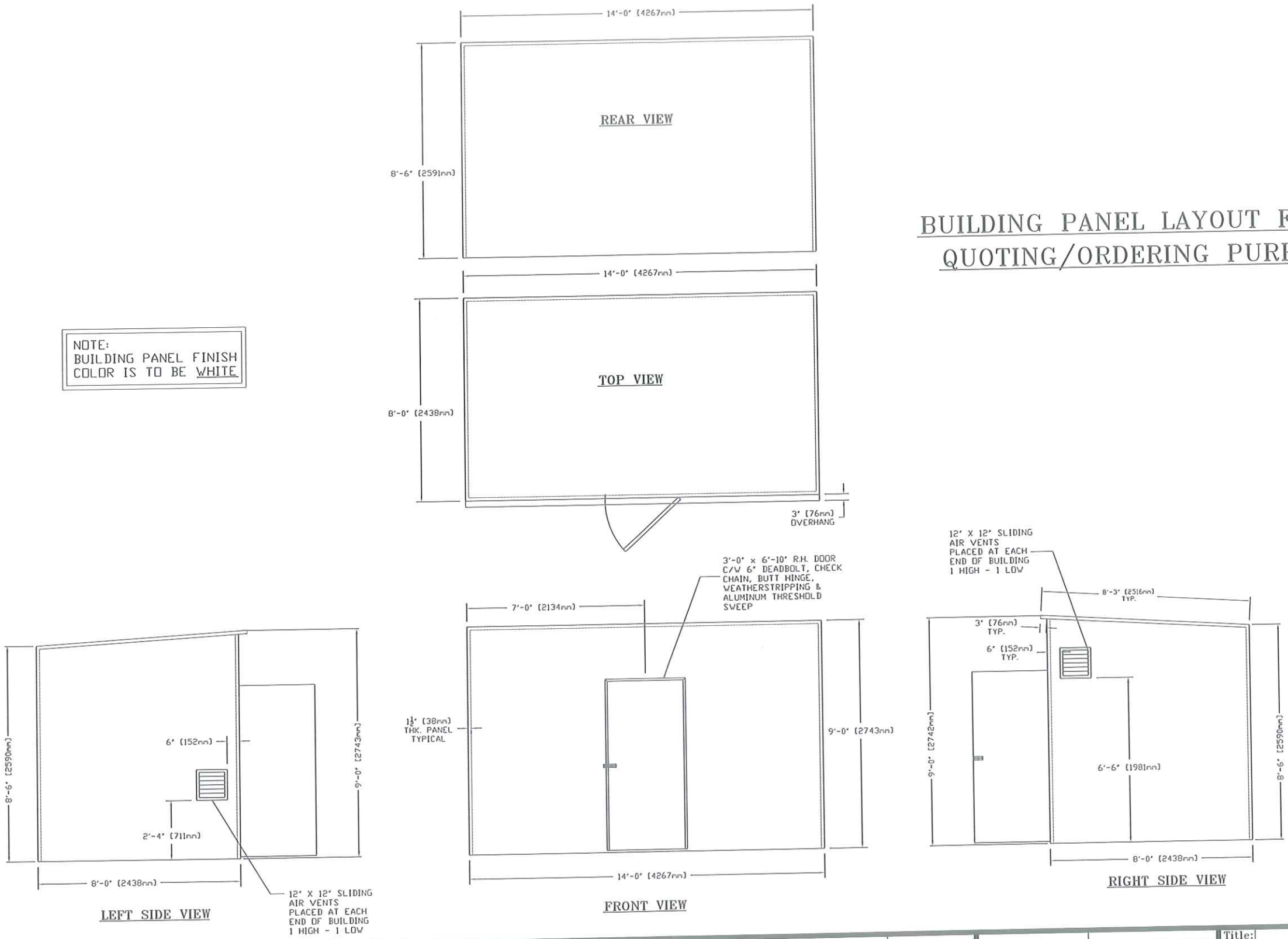
Any Technical Data and the Designs Disclosed Herein are the Exclusive Property of Tornado Technologies Inc. and/or Contained the Proprietary Rights of Others and are not to be used or Disclosed to Others without the Written Consent of Tornado Technologies Inc.

Salesperson: SAMUEL BATTS



# BUILDING PANEL LAYOUT FOR KIT QUOTING/ORDERING PURPOSES

**NOTE:**  
BUILDING PANEL FINISH  
COLOR IS TO BE WHITE



Rev.	Description	By	Y	M	D
2	AS BUILT	AL	14	01	16
1	ISSUED FOR CONSTRUCTION	HW	13	10	29
0	ISSUED FOR REFERENCE PURPOSES	HW	13	07	17

**General Notes:**  
1) MTRS PROVIDED ON REQUEST AND RECEIPT OF ORDER

**Coating & Preparation:**  
1) VESSEL EXTERIOR:  
SANDBLAST: SSPC-SP6  
PRIMER: DEVDE CATHACDAT 302H, 2.5-4.0 mils DFT  
TOPCOAT: CLOVERDALE ARMOURSHIELD  
2-3 mils DFT WARM GREY  
2) VESSEL INTERIOR:  
SANDBLAST: SSPC-SP10  
INTERNAL COATING: DEVDE 253, 10-18 mils

**Fabrication Tolerances \***  
Fractional:  
ø0" to ø24" ±1/8"  
Greater than ø24" ±1/4"  
Decimal:  
ø0" to ø24" ±1/8"  
Greater than ø24" ±1/4"  
Angular:  
All ±2"  
\*Unless otherwise stated

Name of Plant:	-
Lease:	-
Weight - Total Combined:	6,700 LBS.
Weight - Vessel Only:	4,200 LBS.
Weight - Skid & Building:	2,500 LBS.
Design Pressure:	14.7 PSIG
Hydrotest Pressure:	22 PSIG
Max. Operating Pressure:	14.7 PSIG
Design Code:	NBC 2010
Weld Procedure:	#1323.2
APEGGA Permit To Practice:	#P10806
CWB Registration Number:	TDRNG1

Drawing Number:	PENNWEST-13554-SHOP(1)
Drawn By:	HW
Checked By:	EW
Date Drawn:	JULY/17/13
Job Number:	13554
Quote Number:	-
Tag Number:	-
Size Of Vessel in Barrels:	50 BBLs.
Corrosion Allowance:	-

**Title:**  
ø5'-0" O.D X 10'-0" LG. S.S.  
AGKD TANK (50 bbl.)  
C/W ø12" INLET/OUTLET CONN

**Customer:**  
PENNWEST C/O  
PIONEER ENGINEERING

**P.O.#:**  
-

**Salesperson:**  
SAMUEL BATTS

Sheet 1 of 1

**TORNADO COMBUSTION TECHNOLOGIES INC.**  
1-888-882-3882

Any Technical Data and the Designs Disclosed Herein are the Exclusive Property of Tornado Technologies Inc. and/or Contained the Proprietary Rights of Others and are not to be used or disclosed to Others without the Written Consent of Tornado Technologies Inc.