



**WO# 16182**

**Paramount Resources c/o Gas Liquids Engineering**

**25HP Instrument Air Package**

**PO#: 162018 (16104-1501-01 PKG2231)**

**LSD: 06-18-066-04 W6M**



3809 53<sup>rd</sup> Avenue  
Lacombe, AB  
T4L 2L6  
403.782.7708







ENVISION





# INDUSTRIAL GOLD

800 - 742 - 3071

MODEL: SR253ENC62 - CRNNY AIREND: EV03

SERIAL: 120716 - 3110 MOTOR: LEESON

OPERERATING PRESS: 190 PSI

PUMP OIL: RS8000

VOLTAGE: 460 - 480V 3P

**MADE IN THE USA**

# **INDUSTRIAL GOLD**

**800 - 742 - 3071**

**MODEL: SR253ENC62 - CRNNY AIREND: EV03**

**SERIAL: 120716 - 3111 MOTOR: LEESON**

**OPERERATING PRESS: 190 PSI**

**PUMP OIL: RS8000**

**VOLTAGE: 460 - 480V 3P**





CERTIFIED BY

**GLOBAL HEAT TRANSFER**

MAWP: 401 PSI @ 250 °F MDMT: -20°F

CRN #: OH7426.21345 DATE: 12/15  
(month) - (year)

SERIAL #: 1504212013 REF #: 20002674

[www.globalheattransfer.com](http://www.globalheattransfer.com)



CERTIFIED BY

**GLOBAL HEAT TRANSFER**

MAWP: 401 PSI @ 250 °F MDMT: -20°F

CRN #: OH7426.21345 DATE: 12/15  
(month) - (year)

SERIAL #: 1504212014 REF #: 20002674

[www.globalheattransfer.com](http://www.globalheattransfer.com)

266833

CERTIFIED BY STC  
MAWP 300 PSI AT 450°F  
MDMT -20°F AT 300 PSI  
YR BUILT 2016

MADE IN USA

HD. 188 2:1 SH. 188

WESSELS CO

EAP-300

0E



U  
W

BRANDS  
655  
C

366832

CERTIFIED BY STC  
MAX 500 PSI AT 450°F  
MIN 20°F AT 100 PSI  
1/2" BOLT DIA  
1/2" DIA IN

Y222

652447

40574  
CERTIFIED BY

MANCHESTER-TANK

U W MAWP 800 PSI @ 650 F  
EXT. PRESS N/A PSI @ N/A F  
RT-4 MDMT-20 F @ 800 PSI  
CAT# 802422 YR 2016  
GRN F1166.10  
SH .224 GAL 17.4  
HD .203 2:1 SE

④ 657438

411610  
B CERTIFIED BY

MANCHESTER - IN.  
TANK

U/W MAWP 300 PSI @ 400 F  
EXT. PRESS N/A PSI @ N/A F  
RT-1 MDMT-23 F @ 300 PSI  
CAT# 302429 YR 2016  
CRN# 1629 123456; 8141.78  
SH 1600 GAL 240  
HD 253 2:1 SE

A 537457



**NORTHWEST  
EQUIPMENT LTD.**

A SWIFT INDUSTRY COMPANY

415 East Lake Rd.  
Airdrie AB, T4A 2J7  
403-945-1988

Model

**NW-75-300**

SCCR

**5**

kA

S/N

**2331696L**

Design PSI

**300**

MAWP

Line Size

**1" NPT**

Operating PSI

**200**

PSIG

Max Flow

**75**

SCFM

Max Temp

**100**

°F

Volts

**120v**

**60hz**

Phase

**1**

Amps

**2.0**

[www.nwequipltd.com](http://www.nwequipltd.com)

SPECIAL INSPECTION SERVICE  
INTERTEK TESTING SERVICES NA LTD

This product is evaluated to the Model Code SPE-1000. Such evaluation does not constitute certification but is an assessment



Ce produit est évalué selon le code modèle SPE-1000. Une telle évaluation ne constitue pas la certification mais est une

537752



**EnVision Manufacturing & Supply Ltd.**

Quality Control Turnover Package

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# SECTION 1

Bay 2, 3809 53<sup>rd</sup> Avenue  
Lacombe, AB  
T4L 2L6  
403.304.8314

FORM U-1A MANUFACTURER'S DATA REPORT FOR PRESSURE VESSELS

(A) 657436

Part #

(Alternative Form for Single Chamber, Completely Shop or Field Fabricated Vessels Only)

PO #

As Required by the Provisions of the ASME Boiler and Pressure Vessel Code Rules, Section VIII, Division 1

1. Manufactured and certified by Manchester Tank IN, 905 X Street, Bedford, Indiana, 47421  
(Name and address of Manufacturer)

2. Manufactured for Stock  
(Name and address of Purchaser)

3. Location of Installation Unknown  
(Name and address)

4. Type Vertical 400573 to 400578 F1166.1C 302422-REV.E 400573-400578 2016  
(Horizontal or vertical, tank) (Manufacturer's serial number) (CRN) (Drawing number) (National Board number) (Year built)

5. ASME Code, Section VIII, Division 1 2015/ N/A 2726 N/A  
(Edition and Addenda, if applicable (date)) (Code Case numbers) (Special service per UG-120(d))

6. Shell: SA-455 .272 in 0.0" 2' 0" (OD) 4' 4"  
(Material spec. number, grade) (Nominal thickness) (Corr. allow.) (Inner diameter) (Length (overall))

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

7. Seams: Type 1 Spot 85% N/A N/A Type 2 Spot 65% 1  
[Long. (welded, dbl., sngl., lap, butt)] [R.T.(spot or full)] (Eff. %) (H.T. temp) (Time, hr) [Girth. (welded, dbl., sngl., lap, butt)] [R.T. (spot or full)] (Eff. %) (No. of courses)

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

	Location (Top, Bottom, Ends)	Minimum Thickness	Corrosion Allowance	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure (Convex or Concave)
(a)	TOP	.203	N/A	N/A	N/A	2:1	N/A	N/A	N/A	Concave
(b)	BOTTOM	.203	N/A	N/A	N/A	2:1	N/A	N/A	N/A	Concave

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

9. MAWP 300 psi N/A at max. temp. 650 °F N/A  
(Internal) (External) (Internal) (External)

Min. design metal temp. -20 °F at 300 psi Hydro, pneu., or comb. test pressure PNEU. at 390 psi

Proof test N/A

10. Nozzles, inspection and safety valve openings:

Purpose (Inlet, Outlet, Drain, etc.)	No.	Diameter or Size	Type	Material		Nozzle Thickness		Reinforcement Material	Attachment Details		Location (Insp. Open.)
				Nozzle	Flange	Nom.	Corr.		Nozzle	Flange	
UNKNOWN	2	2"	NPT. FLG.	SA-181-70		1500#			UW-16.2(c)		
UNKNOWN	2	.5"	NPT. FLG.	SA-181-70		1500#			UW-16.2(c)		
UNKNOWN	1	1.5"	NPT. FLG.	SA-181-70		1500#			UW-16.2(c)		
UNKNOWN	2	1"	NPT. FLG.	SA-181-70		1500#			UW-16.2(c)		
INSP. OPEN.	2	2"	NPT. FLG.	SA-181-70		1500#			UW-16.2(c)		SHELL
UNKNOWN	1	.25"	NPT. FLG.	SA-181-70		1500#			UW-16.2(c)		

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

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

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

Constructed Under the Provisions of Para. UG-90 (c) (2); Exempt from Impact Testing by UG-20 (f)

## CERTIFICATE OF SHOP/FIELD COMPLIANCE

We certify that the statements made in this report are correct and that all details of design, material, construction, and workmanship of this vessel conform to the ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1. "U" Certificate of Authorization Number 6046 expires November 27, 2016

Date 06/07/2016 Co. name Manchester Tank IN Signed *Algi Bader*  
(Manufacturer) (Representative)

## CERTIFICATE OF SHOP/FIELD INSPECTION

Vessel constructed by Manchester Tank IN at 905 X Street, Bedford, Indiana, 47421  
I, the undersigned, holding a valid commission issued by The National Board of Boiler and Pressure Vessel Inspectors and employed by The Hartford Steam Boiler Inspection and Insurance Company of Connecticut, of Hartford, CT

have inspected the component described in this Manufacturer's Data Report on June 8, 2016, and state that, to the best of my knowledge and belief, the Manufacturer has constructed this pressure vessel in accordance with ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1. By signing this certificate neither the Inspector nor his/her employer makes any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his/her employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date 06/08/2016 Signed *AL AL* Commissions 14873A, IN1976, KY1089, OH1272, IL02274IC  
(Authorized Inspector) [National Board (incl. endorsements)]

FORM U-1A MANUFACTURER'S DATA REPORT FOR PRESSURE VESSELS

(A) 657437

Part #

(Alternative Form for Single Chamber, Completely Shop or Field Fabricated Vessels Only)

PO #

As Required by the Provisions of the ASME Boiler and Pressure Vessel Code Rules, Section VIII, Division 1

1. Manufactured and certified by Manchester Tank IN, 905 X Street, Bedford, Indiana, 47421  
(Name and address of Manufacturer)

2. Manufactured for Stock  
(Name and address of Purchaser)

3. Location of Installation Unknown  
(Name and address)

4. Type Vertical 411010 to 411013 F1629.123456 302429 REV.E 411010-411013 2016  
(Horizontal or vertical, tank) (Manufacturer's serial number) (CRN) (Drawing number) (National Board number) (Year built)

5. ASME Code, Section VIII, Division 1 2015/ N/A 2726 N/A  
(Edition and Addenda, if applicable (date)) (Code Case numbers) (Special service per UG-120(d))

6. Shell: SA-516 Grade 70 .312 in N/A 2' 6" (OD) 5' 6.50"  
(Material spec. number, grade) (Nominal thickness) (Corr. allow.) (Inner diameter) (Length (overall))

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

7. Seams: Type 1 Spot 85% N/A N/A Type 2 Spot 65% 1  
[Long. (welded, dbl., singl., lap, butt)] [R.T.(spot or full)] (Eff.,%) (H.T. temp) (Time, hr) [Girth. (welded, dbl., singl., lap, butt)] [R.T. (spot or full)] (Eff., %) (No. of courses)

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

	Location (Top, Bottom, Ends)	Minimum Thickness	Corrosion Allowance	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure (Convex or Concave)
(a)	TOP	.253	N/A	N/A	N/A	2:1	N/A	N/A	N/A	Concave
(b)	BOTTOM	.253	N/A	N/A	N/A	2:1	N/A	N/A	N/A	Concave

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

9. MAWP 300 psi N/A at max. temp. 400 °F N/A  
(Internal) (External) (Internal) (External)

Min. design metal temp. -20 °F at 300 psi Hydro, pneu., or comb. test pressure PNEU. at 390 psi

Proof test N/A

10. Nozzles, inspection and safety valve openings:

Purpose (Inlet, Outlet, Drain, etc.)	No.	Diameter or Size	Type	Material		Nozzle Thickness		Reinforcement Material	Attachment Details		Location (Insp. Open.)
				Nozzle	Flange	Nom.	Corr.		Nozzle	Flange	
Insp.Open.	2	2"	NPT.FLG.	SA-181-70		1500#			UW-16.2 (C)		Shell
Unknown	2	1"	NPT.FLG.	SA-181-70		1500#			UW-16.2 (C)		
Unknown	2	.5"	NPT.FLG.	SA-181-70		1500#			UW-16.2 (C)		
Unknown	2	2"	NPT.FLG.	SA-181-70		1500#			UW-16.2 (C)		
Unknown	1	.25"	NPT.FLG.	SA-181-70		1500#			UW-16.2 (C)		
Unknown	1	1.5"	NPT.FLG.	SA-181-70		1500#			UW-16.2 (C)		

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

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

N/A

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

Constructed Under the Provisions of Para. UG-90 (c) (2); Exempt from Impact Testing by UG-20 (f)

## CERTIFICATE OF SHOP/FIELD COMPLIANCE

We certify that the statements made in this report are correct and that all details of design, material, construction, and workmanship of this vessel conform to the ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1. "U" Certificate of Authorization Number 6046

expires November 27, 2019

Date 11/15/2016

Co. name

Manchester Tank IN

(Manufacturer)

Signed

[Signature]  
(Representative)

## CERTIFICATE OF SHOP/FIELD INSPECTION

Vessel constructed by Manchester Tank IN at 905 X Street, Bedford, Indiana, 47421

I, the undersigned, holding a valid commission issued by The National Board of Boiler and Pressure Vessel Inspectors and employed by The Hartford Steam Boiler Inspection and Insurance Company of Connecticut, of Hartford, CT

have inspected the component described in this Manufacturer's Data Report on November 16, 2016, and state that, to the best of my knowledge and belief, the Manufacturer has constructed this pressure vessel in accordance with ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1. By signing this certificate neither the Inspector nor his/her employer makes any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his/her employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date 11/16/2016

Signed

[Signature]  
(Authorized Inspector)

Commissions

14873A, IN1976, KY1089, OH1272, IL02274IC  
[National Board (incl. endorsements)]

Model  
30464  
Job #

(Alternative Form for Single Chamber, Completely Shop or Field Fabricated Vessels Only)  
As Required by the Provisions of the ASME Boiler and Pressure Vessel Code Rules, Section VIII, Division 1

- Manufactured and certified by Wessels Company, STC, 101 Tank St., Greenwood, Indiana, 46143  
(Name and address of Manufacturer)
- Manufactured for Wessels Company, 101 Tank Street, Greenwood, Indiana, 46143  
(Name and address of Purchaser)
- Location of Installation Stock  
(Name and address)
- Type Vertical 266832 to 266833 Y3221.2 127-0702 266832-266833 2016  
(Horizontal or vertical, tank) (Manufacturer's serial number) (CRN) (Drawing number) (National Board number) (Year built)
- ASME Code, Section VIII, Division 1 2015/ N/A 1518-5, 2055-2 ----  
(Edition and Addenda, if applicable (date)) (Code Case numbers) (Special service per UG-120(d))
- Shell: SA-53-B .188" N/A 0' 8.625" (OD) 4' 7"  
(Material spec. number, grade) (Nominal thickness) (Corr. allow.) (Inner diameter) (Length (overall))

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

- Seams: Type E N/A 85% ---- ---- Type 2 None 65% 1  
(Long, (welded, dbl., singl., lap, butt)) (R.T. (spot or full)) (Eff. %) (H.T. temp) (Time, hr) (Girth, (welded, dbl., singl., lap, butt)) (R.T. (spot or full)) (Eff. %) (No. of courses)

- Heads: (a) Material SA-414-G (b) Material SA-414-G  
(Spec. no., grade) (Spec. no., grade)

	Location (Top, Bottom, Ends)	Minimum Thickness	Corrosion Allowance	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure (Convex or Concave)
(a)	TOP	.188"	N/A	N/A	N/A	2:1	N/A	N/A	N/A	Concave
(b)	BOTTOM	.188"	N/A	N/A	N/A	2:1	N/A	N/A	N/A	Concave

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

- MAWP 300 psi N/A at max. temp. 450 °F N/A  
(Internal) (External) (Internal) (External)  
Min. design metal temp. -20 °F at 300 psi Hydro, pneu., or comb. test pressure HYDRO at 390 psi  
Proof test N/A

- Nozzles, inspection and safety valve openings:

Purpose (Inlet, Outlet, Drain, etc.)	No.	Diameter or Size	Type	Material		Nozzle Thickness		Reinforcement Material	Attachment Details		Location (Insp. Open.)
				Nozzle	Flange	Nom.	Corr.		Nozzle	Flange	
Inlet/Outlet	4	1"	NPT	SA-181-70		STD		Not Required	UW-16.2c		Heads
Spare	2	1/4"	NPT	SA-181-70		STD		Not Required	UW-16.2c		Shell

- Supports: Skirt No Lugs N/A Legs 2 Other Channel Attached Shell Welded  
(Yes or no) (Number) (Number) (Describe) (Where and how)

12. Remarks: Manufacturer's Partial Data Reports properly identified and signed by Commissioned Inspectors, have been furnished for the following items of the report  
N/A  
(Name of part, item number, Manufacturer's name and identifying stamp)

Constructed under the provisions of UG-90 (c) (2). MDMT has been evaluated per UG-20 (f), therefore impact testing is not required. Safety Relief by Others.

Model

30464

Job #

(Alternative Form for Single Chamber, Completely Shop or Field Fabricated Vessels Only)

As Required by the Provisions of the ASME Boiler and Pressure Vessel Code Rules, Section VIII, Division 1

1. Manufactured and certified by Wessels Company, STC, 101 Tank St., Greenwood, Indiana, 46143

(Name and address of Manufacturer)

2. Manufactured for Wessels Company, 101 Tank Street, Greenwood, Indiana, 46143

(Name and address of Purchaser)

3. Location of Installation Stock

(Name and address)

4. Type Vertical 266832 to 266833 Y3221.2 127-0702 266832-266833 2016  
(Horizontal or vertical, tank) (Manufacturer's serial number) (CRN) (Drawing number) (National Board number) (Year built)5. ASME Code, Section VIII, Division 1 2015/ N/A 1518-5, 2055-2 ----  
(Edition and Addenda, if applicable (date)) (Code Case numbers) (Special service per UG-120(d))6. Shell: SA-53-B .188" N/A 0' 8.625" (OD) 4' 7"  
(Material spec. number, grade) (Nominal thickness) (Corr. allow.) (Inner diameter) (Length (overall))

## Body Flanges on Shells

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

7. Seams: Type E N/A 85% ---- ---- Type 2 None 65% 1  
(Long. (welded, dbl., sngl., lap, butt)) (R.T. (spot or full)) (Eff. %) (H.T. temp) (Time, hr) (Girth. (welded, dbl., sngl., lap, butt)) (R.T. (spot or full)) (Eff. %) (No. of courses)8. Heads: (a) Material SA-414-G (b) Material SA-414-G  
(Spec. no., grade) (Spec. no., grade)

	Location (Top, Bottom, Ends)	Minimum Thickness	Corrosion Allowance	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure (Convex or Concave)
(a)	TOP	.188"	N/A	N/A	N/A	2:1	N/A	N/A	N/A	Concave
(b)	BOTTOM	.188"	N/A	N/A	N/A	2:1	N/A	N/A	N/A	Concave

## Body Flanges on Heads

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

9. MAWP 300 psi N/A at max. temp. 450 °F N/A  
(Internal) (External) (Internal) (External)Min. design metal temp. -20 °F at 300 psi Hydro, pneu., or comb. test pressure HYDRO at 390 psiProof test N/A

10. Nozzles, inspection and safety valve openings:

Purpose (Inlet, Outlet, Drain, etc.)	No.	Diameter or Size	Type	Material		Nozzle Thickness		Reinforcement Material	Attachment Details		Location (Insp. Open.)
				Nozzle	Flange	Nom.	Corr.		Nozzle	Flange	
Inlet/Outlet	4	1"	NPT	SA-181-70		STD		Not Required	UW-16.2c		Heads
Spare	2	1/4"	NPT	SA-181-70		STD		Not Required	UW-16.2c		Shell

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

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

N/A

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

Constructed under the provisions of UG-90 (c) (2). MDMT has been evaluated per UG-20 (f), therefore impact testing is not required. Safety Relief by Others.





**Pressure - Temperature/Pression - température**

Constructed for max. allowable working pressure <i>Construit pour une pression maximale de marche permise</i>	At max. temp. <i>A une temp. max.</i>	Minimum design metal temp. <i>Temp. min.</i>	Test pressure (hydro-pneumatic or combination) <i>Pression d'épreuve (hydro-pneumatique ou combinaison)</i>	Proof Test <i>test de résistance</i>
Internal: 402 PSI	Internal: 250 F	-20F	531 PSI	531 PSI
External: N/A	External: N/A	N/A	N/A	N/A

**Impact Tests/Tests d'impact**

Material/Matériau		Welds/Soudures	
_____ @ _____	_____	_____ @ _____	_____
Components/composants	Test Temp/essai Température	Production Test/test de production	Test Temp/Test de Température
_____ Exempt PER _____	_____	_____ Exempt PER _____	_____
Components/composants	Paragraph(s)/paragraphe (s)	_____	Paragraph(s)/paragraphe (s)

Indicate Components Impact Tested or Exempted/Indiquer Composants impact Testé ou exclus

**Tube Section/Faisceau tubulaire**

Tubeshet/Plaque tubulaire	Material/Matériau	Diameter/Diamètre	Nominal Thickness <i>Épaisseur nominale</i>	Corr. Allow. <i>Surépais. corrosion</i>	Attachment <i>Mode d'attachement</i>
Tube material/Matériau des tubes	Diameter/Diamètre	Nominal Thickness (gauge) <i>Épaisseur nominale (calibre)</i>	Number/Numéro	Type (Straight or U) <i>Type (Droit ou U)</i>	Heating Surface <i>Surface de chauffage</i>
SB 221 / SB 209 3003	N/A	N/A	N/A	N/A	N/A

**Jacket/Chemise**

Type of Jacket/Genre de chemise	Jacket Closure <i>Fermeture de chemise</i>	Proof Test <i>Épreuve de Pression</i>	Heating Surface <i>Surface de chauffe</i>	Sketch/Schéma
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**Safety Valve Outlets/Soupapes de sûreté**

Number/Nombre	Dimension	Location/Endroit <b>TO BE INSTALLED</b>
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**Nozzles and Openings/Tubulures et ouvertures**

Purpose/But <i>(Inlet, Outlet, Drain Etc.)</i>	Number Nombre	Dimension	Type	Material Matériau		Nozzle Thickness <i>Épaisseur nominale</i>		Reinforcement material Matériau de renfort	Attachment Details Genre d'attaches		Location Endroit
				Nozzle/bec	Flange/bride	Nom.	Corr.		Nozzle/bec	Flange/bride	
Inlet/Outlet	2	1.5" NPT	Coupling	SB 221 6061 T6		0.3"	N/A	N/A	UW-16.1 (bb)		Manifold Top
Inlet/Outlet	2	1.0" NPT	Coupling	SB 221 6061 T6		0.3"	N/A	N/A	UW-16.1 (bb)		Manifold Face
Drain	1	0.25" NPT	Coupling	SB 221 6061 T6		0.3"	N/A	N/A	UW-16.2 (bb)		Manifold Face

**Supports/Supports**

Skirt/Jupe Yes/Oui No/Non <input type="checkbox"/> <input type="checkbox"/>	Lugs/Oreilles No./Nbre	Legs/Pieds No./Nbre	Other/Autres (Description)	Attached/Attaches <i>(Where and How/Méthode et endroit)</i>
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**Remarks/Observations (Cubical Capacity/Volume/Capacité cubique/volume de)**

Refer Dwg: 20002670 PO# 13485
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**Certificate of Compliance/Certificat de conformité**

We certify that the statements made in this data report are correct and that the said vessel has been constructed in accordance with the Provincial Registered design below and the requirements of standard CSA B51.

*Nous certifions que les données de la déclaration de conformité sont correctes et que l'appareil a été construit en accord avec l'enregistrement provincial ci-dessous et les exigences de la norme ACNOR B51.*

Provincial Registered Design  
Enregistrement provincial / **OH 7426.21345**

Manufacturer  
Constructeur **GLOBAL HEAT TRANSFER LTD**

Signature \_\_\_\_\_ Date **11 FEB 16**  
*(Representative/représentant)*

Signature \_\_\_\_\_ Date \_\_\_\_\_  
*(Certified Individual/personne certifiée)*



**Pressure - Temperature/Pression - température**

Constructed for max. allowable working pressure <i>Construit pour une pression maximale de marche permise</i>	At max. temp. <i>A une temp. max.</i>	Minimum design metal temp. <i>Temp. min.</i>	Test pressure (hydro-pneumatic or combination) <i>Pression d'épreuve (hydro-pneumatique ou combinaison)</i>	Proof Test <i>test de résistance</i>
Internal: 402 PSI	Internal: 250 F	-20F	531 PSI	531 PSI
External: N/A	External: N/A	N/A	N/A	N/A

**Impact Tests/Tests d'impact**

Material/Matériau		Welds/Soudures	
_____ @ _____	_____	_____ @ _____	_____
Components/composants	Test Temp/essai Température	Production Test/test de production	Test Temp/Test de Température
_____ Exempt PER _____	_____	_____ Exempt PER _____	_____
Components/composants	Paragraph(s)/paragraphe (s)	_____	Paragraph(s)/paragraphe (s)

Indicate Components Impact Tested or Exempted/Indiquer Composants impact Testé ou exclus

**Tube Section/Faisceau tubulaire**

Tubeshet/Plaque tubulaire	Material/Matériau	Diameter/Diamètre	Nominal Thickness <i>Épaisseur nominale</i>	Corr. Allow. <i>Surépais. corrosion</i>	Attachment <i>Mode d'attachement</i>
Tube material/Matériau des tubes	Diameter/Diamètre	Nominal Thickness (gauge) <i>Épaisseur nominale (calibre)</i>	Number/Numéro	Type (Straight or U) <i>Type (Droit ou U)</i>	Heating Surface <i>Surface de chauffage</i>
SB 221 / SB 209 3003	N/A	N/A	N/A	N/A	N/A

**Jacket/Chemise**

Type of Jacket/Genre de chemise	Jacket Closure <i>Fermeture de chemise</i>	Proof Test <i>Épreuve de Pression</i>	Heating Surface <i>Surface de chauffe</i>	Sketch/Schéma
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**Safety Valve Outlets/Soupapes de sûreté**

Number/Nombre	Dimension	Location/Endroit <b>TO BE INSTALLED</b>
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**Nozzles and Openings/Tubulures et ouvertures**

Purpose/But (Inlet, Outlet, Drain Etc.)	Number Nombre	Dimension	Type	Material Matériau		Nozzle Thickness Épaisseur nominale		Reinforcement material Matériau de renfort	Attachment Details Genre d'attaches		Location Endroit
				Nozzle/bec	Flange/bride	Nom.	Corr.		Nozzle/bec	Flange/bride	
Inlet/Outlet	2	1.5" NPT	Coupling	SB 221 6061 T6		0.3"	N/A	N/A	UW-16.1 (bb)		Manifold Top
Inlet/Outlet	2	1.0" NPT	Coupling	SB 221 6061 T6		0.3"	N/A	N/A	UW-16.1 (bb)		Manifold Face
Drain	1	0.25" NPT	Coupling	SB 221 6061 T6		0.3"	N/A	N/A	UW-16.2 (bb)		Manifold Face

**Supports/Supports**

Skirt/Jupe Yes/Oui No/Non <input type="checkbox"/> <input type="checkbox"/>	Lugs/Oreilles No./Nbre	Legs/Pieds No./Nbre	Other/Autres (Description)	Attached/Attaches (Where and How/Méthode et endroit)
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**Remarks/Observations (Cubical Capacity/Volume/Capacité cubique/volume de)**

Refer Dwg: 20002670 PO# 13485
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**Certificate of Compliance/Certificat de conformité**

We certify that the statements made in this data report are correct and that the said vessel has been constructed in accordance with the Provincial Registered design below and the requirements of standard CSA B51.

*Nous certifions que les données de la déclaration de conformité sont correctes et que l'appareil a été construit en accord avec l'enregistrement provincial ci-dessous et les exigences de la norme ACNOR B51.*

Provincial Registered Design  
Enregistrement provincial / **OH 7426.21345**

Manufacturer  
Constructeur **GLOBAL HEAT TRANSFER LTD**

Signature \_\_\_\_\_  
(Representative/représentant)

Date **11 FEB 16**

Signature \_\_\_\_\_ Date \_\_\_\_\_  
(Certified Individual/personne certifiée)



# PRESSURE PIPING CONSTRUCTION AND TEST DATA REPORT

In accordance with the provisions of the PESR Section 31(1)

Shop Construction ; Field Construction ;  
 Final Data Report ; Partial Data Report  (from one ABSA- authorized Contractor to another ABSA- authorized Contractor).

Complete both sides of this Form

1. Constructed By: EnVision Manufacturing & Supply Ltd. Owner's Job No: 16182  
(Name of ABSA authorized primary contractor or subcontractor)  
Bay 2, 3809, 53<sup>rd</sup> Avenue, Lacombe, AB T4L 2L6  
(Address)

Certificate of Authorization Permit No. AQP-1584 Expiry Date: April 25, 2019

2. Constructed For: N/A  
(Name of primary contractor if different from above)

N/A  
(Address)

Certificate of Authorization Permit No. AQP-N/A Expiry Date: N/A  
(Required when the primary contractor undertakes some/all of the quality functions, e.g., NDE, PWHT, Tie-in, fabrication, hydro test, final assembly etc.)

3. Owner: Paramount Resources Ltd.  
(Name and address)

06-18-066-04 W6M  
(Location of installation)

Certificate of Authorization Permit No. AQP-N/A Expiry Date: N/A  
(Required when the owner undertakes some/all of the quality functions, e.g., NDE, PWHT, Tie-in, fabrication, hydro test, final assembly etc.)

4. Piping Design Alberta Registration No.: PP- 0328-G-050-P  
(Required if aggregate piping volume is over 0.5m<sup>3</sup>)

5. Design Responsibility: Owner ; Contractor

6. WP No.: WP-3603.2; Company: EnVision Manufacturing\* Owner's WP No. (If used): WP-N/A  
(Alberta Registration No.) (Alberta Registration No.)  
 Spec No(s). used: ENV 1 REV 0; Owner's Spec No(s). (If used): N/A

7. Code: ASME B31.1 Non Boiler External Piping ; ASME B31.1 Boiler External Piping ;  
 B31.5 ; B31.9 ; CSA Z662 Steam Pipelines ;  
 ASME B31.3  - Service Category: Normal , D , M , High Pressure ; Severe Cyclic Condition   
 High Purity

Drawing No. Rev. No. Line No.	Fluid (Air/Stm. Etc.)	Des. Press. kPa	Des. Temp. °C (Max. & Min.)	Pressure Test kPa	Test Medium	Pipe Mat'l Spec. & Grade	C.A. mm	Pipe NPS & Schedule	Flange Material & Rating	PWHT/ Preheat Temp. °C	NDE
16182 DUAL- 25HP-INST AIR PID REV 0 2231-AO-1"-A-01	AIR	1551	-29/350	2323	WATER	SA-106 GR B	1.6	½", ¾", 1", 2" SCH80	N/A	N/A	100% VT
16182 DUAL- 25HP-INST AIR PID REV 0 2231-AV-1"-A-02	AIR	1551	-29/350	2323	WATER	SA-106 GR B	1.6	1", 2" SCH80	N/A	N/A	100% VT
16182 DUAL- 25HP-INST AIR PID REV 0 2231-AV-1"-A-03	AIR	1551	-29/350	2323	WATER	SA-106 GR B	1.6	1" SCH80	N/A	N/A	100% VT
16182 DUAL- 25HP-INST AIR PID REV 0 2231-AV-1"-AL-04	AIR	1551	-45/350	2323	WATER	SA-333 GR 6	1.6	1" SCH80	N/A	N/A	100% VT
16182 DUAL- 25HP-INST AIR PID	AIR	1551	-29/350	2323	WATER	SA-106 GR B	1.6	½", 1" SCH80	N/A	N/A	100% VT

Partial Data Reports certified by sub-contractors are listed below and attached to this Data Report

No.	Line No.	Spool No.	Dwg. No. (with Rev. No.)	Sub-contractor (Name)	AQP No. (if from Alberta)	Expiry (if from Alberta)

Remarks: For partial data report provide information about the code work that was not completed by the subcontractor (e.g., hydrostatic test, PWHT etc.). For final data report provide information about the code work that was not completed by subcontractors and subsequently completed by the primary contractor (e.g., hydrostatic test of entire assembly, PWHT etc.)

\*Legal company name, where EnVision Manufacturing is stated, is EnVision Manufacturing & Supply Ltd.

Endorse certificate 'A' or 'B'	
<p style="text-align: center;"><b>A. CERTIFICATE OF COMPLIANCE</b> Signed by the subcontractor when supplying this certificate as a <b>Partial Data Report</b></p> <p>We certify that the statements in this Data Report are correct and that materials, construction and workmanship of the piping fabrication conform to the registered quality system and the applicable Piping code(s).</p> <p>Date: _____</p> <p style="text-align: right;">_____ Contractor</p> <p>_____ Print Authorized Representative's Name      Signature</p> <p><b>This certificate is not valid unless it forms part of a Final Data Report signed by Primary Contractor</b></p>	<p style="text-align: center;"><b>B. CERTIFICATE OF COMPLIANCE</b> Signed by the primary contractor when supplying this certificate as a <b>Final Data Report</b></p> <p>We certify that the statements in this Data Report are correct and that piping job no. <u>16182</u> described in this Data Report was constructed in accordance with the Province of Alberta Safety Codes Act and Regulations, and applicable ASME Piping Code(s).</p> <p>Date: <u>Jan 9/17</u> EnVision Manufacturing* _____ Contractor</p> <p><u>Tasha McDonald</u> Print Authorized Representative's Name      Signature</p>

CERTIFICATE OF INSPECTION	
<p>I, the undersigned, employed by <u>INTERTEK</u> have verified that all required examination and testing has been completed, and inspected the piping described in this construction data report to the extent necessary to be satisfied that it conforms to all applicable examination requirements of the Code and of the engineering design, and state that, to the best of my knowledge and belief, the contractor has constructed this piping in accordance with the Alberta Safety Codes Act and Regulations. By signing this certificate neither the inspector nor his or her employer makes any warranty, expressed or implied, concerning the piping described in this construction data report. Furthermore, neither the inspector nor his or her employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.</p>	
<p>Date: <u>Jan 17, 2017</u></p> <p><u>RAM JAYARAMAN</u> Owner's Inspector Name (please print)</p> <p><u>[Signature]</u> Owner's Inspector Signature:</p>	<p>Date: _____</p> <p>ABSA Safety Codes Officer (please print) (BOILER EXTERNAL PIPING ONLY)</p> <p>_____ ABSA Safety Codes Officer's Signature</p>



Current version of this Form may be obtained from [www.absa.ca](http://www.absa.ca)

No.	Description of Activity	QC Activity Required	QC Manual Reference	Acceptance Criteria	Verification Document	EnVision Inspection Criteria				Customer's Inspection criteria		
						Requirement	Duty	Initial	Date	Requirement	Initial	Date
1	IFC Drawings	Confirm approval	N/A	Approval Stamp	Customer Approved IFC Drawings	D	QCM / QCI					
2	ITP	Prepare, review and approve ITP	N/A	Approval Stamp	ITP	D	QCM / QCI					
3	Weld Procedures	Confirm WPS is suitable	Section 11 Para. 11.5 (b)	Approval Stamp	Weld Procedures	D	QCM	JUCO	NOV 17/16			
4	Welder Qualifications	Review/confirm welders are qualified	Section 11 Para. 11.5 (a)	ASME Section IX	Welder Qualification Records	D	QCM	JUCO	NOV 16/16			01/09/17
5	NDT Subcontractor Qualifications	Review/confirm approval of NDT contractors procedures	Section 13 Para. 13.2	Letter of Appointment	Contractor's approved procedures	I	QCM	JUCO	DEC 27/16			01/09/17
6	Inspection & Test Procedures	Confirm required hydrostatic, pneumatic, mechanical and electrical test procedures	Section 16 Section 22	Approval Stamp	QC Manual	I	QCM / QCI	JUCO	DEC 28/16			01/09/17
7	Material Receipt Inspection	Material receiver visually inspects all material for correct size, rating and quantity and verifies material traceability and MTRs	Section 9	Approval Stamp	Material Receiving Report & MTRs	I D	QCI / F	JUCO	DEC 9/16			01/09/17
8	Weld Joint Prep	Record heat numbers. Verify proper bevel for joint design	Section 9 B31.3 328.4.2	IFC Drawings ASME B31.3	QC Manual	I	QCI / F	JUCO	DEC 15/16			01/09/17
9	Layout & Fit-Up	Verify dimensions & layout are correct as per IFC drawings. Monitor material markings, tacking, cleanliness and alignment	Section 10 B31.3 328.4.4	IFC Drawings ASME B31.3	QC Manual	I	QCI / F	JUCO	DEC 27/16			01/09/17
10	Procedural Requirements	Verify WPS is being followed and welding material/consumables are being controlled as per procedures	Section 11 Para. 11.5	IFC Drawings ASME B31.3	Weld Procedures	I	QCI / F	JUCO	DEC 27/16			01/09/17
11	Visual Inspection	Visually inspect all welds prior to NDT	Section 11 Para. 11.5 (c)	IFC Drawings ASME B31.3	QC Manual	I	QCI / F / CI	JUCO	DEC 29/16			01/09/17
12	NDT Inspection	Verify number of welds required to be x-rayed. Verify NDT performed by technician by reviewing x-ray films and reports	Section 13 Para. 13.3	IFC Drawings ASME B31.3	QC Manual, RT Reports & Maps	I D	QCI / F / CI	JUCO	DEC 30/16			01/09/17
13	Code & Drawing Compliance	Confirm dimensions & orientations are within code requirements/tolerances	Section 8 Section 10	IFC Drawings ASME B31.3	QC Manual & As-Built Drawings	I W	QCI / F / CI	JUCO	DEC 29/16			01/09/17
14	Mechanical Inspection	Confirm proper installation of parts as per P&ID	Section 8 Section 10	IFC Drawings ASME B31.3	QC Manual & As-Built Drawings	I W	QCI / F / CI	JUCO	JAN 6/17			01/17/17
15	Hydrostatic Test	Verify leak free assembly at welded, bolted and threaded joints at required test pressure shown on drawings	Section 16	Test Procedure ASME B31.3	QC Manual & Test Report	D W H	QCI / CI	JUCO	JAN 9/17			01/09/17
16	Calibration of Test Equipment	Verify proper calibration records are on file for all test equipment used	Section 15	ASME B31.3	Calibration Reports	I H	QCI	JUCO	JAN 9/17			01/09/17
17	NCR	Generate NCR for any material or workmanship that does not meet code or project specs	Section 12	Project Specifications ASME B31.3	IFC Drawings, PO & Project Specs	H D	QCI	NIA	NIA			
18	NCR Rectification	Material is rejected or repaired as per code and customer approval	Section 12	Project Specifications ASME B31.3	Signed NCR	H D	QCI	NIA	NIA			
19	Final Inspection	100% visual inspection of completed project	Section 10	IFC Drawings ASME B31.3	Final Inspection Checklist	I H	QCI / F / CI	JUCO	JAN 16 2017			01/17/17
20	QC Documentation	Confirm QC package is complete	Section 17	ITP & Project Specifications	Completed QC Package	D	QCI / CI	JUCO	JAN 16 2017			01/17/17
21	Turn Over File	Send copy of final QC package to client	Section 17	ITP & Project Specifications	QC Package Checklist	D	QCI	JUCO	JAN 17 2017			

ITP Prepared By: Tasha McDonald  
 Print Full Name

Paramount  
 Signature

17-Nov-16  
 Date

ITP Approved By: \_\_\_\_\_  
 Print Full Name

\_\_\_\_\_  
 Signature

\_\_\_\_\_  
 Date

- Legend:
- I - Envision Inspection Point
  - W - Witness; Non mandatory. If not available, proceed
  - H - Hold Point
  - D - Document required
  - R - Document Review

- QCI - Quality Control Shop Inspector
- QCM - Quality Control Manager
- F - Shop Foreman/Operations Manager
- CI - Customer Inspector

Work Order #: 16182

Customer: Paramount Resources

Date: October 13, 2016

Activity	EnVision Inspection Criteria			Customer's Inspection Criteria		
	Requirement	Initial	Date	Requirement	Initial	Date
IFC Drawings	H	JUCO	NOV29/16	R	JH	01/17/17
Welder Qualifications	D	JUCO	NOV30/16	R	JH	01/17/17
Material Receipt Inspection	I	JUCO	NOV21/16	R	JH	01/17/17
Layout & Fit-Up	H	JUCO	Dec 2/16	R	JH	01/17/17
Welding in Progress	I	JUCO	Dec 15/16	R	JH	01/17/17
Fit-Up After Welding Prior to Checker Plate	I	JUCO	Dec 19/16	R	JH	01/17/17
External Attachment Inspection Lift Lugs, Methanol Extension	I	JUCO	Dec 20/16	R	JH	01/17/17
Fit-Up After Checker Plate	H	JUCO	Dec 20/16	R	JH	01/17/17
Containment Complete & Tested	I	JUCO	Dec 21/16	R	JH	01/17/17
Skid Square	I	JUCO	Dec 22/16	R	JH	01/17/17
Final Visual Inspection	H/I	JUCO	Dec 22/16	H/JH	JH	01/17/17
NCR's Rectified	D/R/W	N/A	N/A			
All QC Package Requirements Completed & Filed	R	JUCO	Dec 24/16		JH	01/17/17
Release Complete & Signed-Off	R	N/A	N/A			

H - Hold Point I - EnVision Inspection Point D - Document Required W - Witness R - Document Review

NOTES:

→ 2" underskid insulation



ENVISION MANUFACTURING & SUPPLY LTD.  
QUALITY CONTROL MANUAL

No.	Function	QC Manual Reference	Signature or Initial & Date	
			EnVision QC Inspector	Owner's Inspector
1	ABSA registration over 0.5 m3. Drawings approved by owner and IFC'd. (signed and dated). <i>Customer requested</i>	20.3, 20.4	<i>JUCO Dec 21/16</i>	<i>H 1/17/17</i>
2	ABSA Safety Codes Officer and owner's inspector notified.	20.20	<i>JUCO Nov 9/16</i>	<i>H 1/17/17</i>
3	Registered welding procedure specifications, QC Manual and forms available at site. Job file started.	20.19	<i>JUCO Nov 9/16</i>	<i>H 1/17/17</i>
4	Welders qualified for welding procedure specifications and have valid performance qualification cards. Welders Log completed. Welding procedure specification reviewed with welders.	11.4, 20.17	<i>JUCO Nov 9/16</i>	<i>H 1/17/17</i>
5	Material checked against PO, drawings and specifications. Identification confirmed. Colour coding applied.	20.12, 20.14	<i>JUCO Dec 15/16</i>	<i>H 1/17/17</i>
6	Sample of each welder's work examined, including root spacing, alignment, cleaning, joint preparation, preheat and electrode control.	11.5, 20.20	<i>JUCO Dec 27/16</i>	
7	Non-destructive examination completed. Reports and radiographs reviewed, signed by a Level II or III, radiograph ID detailed on drawings.	13.3	<i>JUCO Dec 30/16</i>	<i>H 1/17/17</i>
8	Visual examination of all completed welds. Welders ID stamped and recorded on drawings.	11.5, 20.20	<i>JUCO Dec 29/16</i>	<i>H 1/17/17</i>
9	Heat Treatment verified and recorded on drawings.	14.6	NIA	NIA
10	Each system checked against specifications and drawings before test, using Exhibit 21.3 and Exhibit 21.4.	20.20, 20.21	<i>JUCO Jan 6/17</i>	<i>H 1/17/17</i>
11	All deficiencies recorded and signed off by QC Inspector and Owner's Inspector before test.		<i>JUCO Jan 9/17</i>	<i>H 1/17/17</i>
12	Pressure test checked. Gauge calibration verified, gauge numbers recorded.	20.21	<i>JUCO Jan 9/17</i>	<i>H 1/17/17</i>
13	System checked after test. Deficiencies recorded and corrected (Exhibit 21.4).	20.21	<i>JUCO Jan 9/17</i>	<i>H 1/17/17</i>
14	Construction Data Reports (AB-83) prepared and signed by QC Inspector and Owner's Inspector	20.20(g)	<i>JUCO JAN 17 2017</i>	<i>H 1/17/17</i>
15	Declaration form (AB-81) submitted to ABSA.	20.19(c)	NIA	NIA.
16	As-built drawings accepted by Owner.	20.20(h)	<i>JUCO</i>	

JAN 17 2017

*Piping Registration No.: PP-0328-G-050-P.*



No.	Function	Q.C Insp.
1	Pipe material checked - schedule and specification correct.	Success JAN 09 2017
2	Flange ratings, schedule and material specification correct.	Success JAN 09 2017
3	Fittings, tees, return bends, reducers, couplings and weldolets. Correct schedule and material specification.	Success JAN 09 2017
4	Valve identification (manufacturer's name tag etc) correct.	Success JAN 09 2017
5	Valve installed correctly, flow direction, accesses, rising stems free from obstructions, clearance for removal adequate.	Success JAN 09 2017
6	Lubrication fittings, drains etc., installed as required.	Success JAN 09 2017
7	Bolts, studs and nuts are correct length and material. Studs are at least flush with heads (max thread exposure beyond nut should be about 2 threads).	Success JAN 09 2017
8	Gaskets are correct type, material, size etc.	Success JAN 09 2017
9	All welds satisfactory and traceable to welder's symbol.	Success JAN 09 2017
10	Seal welding complete - all threads covered.	N/A
11	All attachment weld satisfactory.	N/A
12	All NDE, heat treatment complete, records filed.	Success JAN 09 2017
13	Guide anchors and shoes required installed correctly (high temp. lines).	N/A
14	Line supports adequate - supports to be checked against drawings.	N/A
15	Spring hangers are correct type and installed correctly.	N/A
16	Lines have adequate allowance for expansion.	N/A
17	Bellows type expansion joints - correct type, pressure rating and correct installation.	N/A
18	Required cold spring applied.	N/A
19	Orifice runs have specified straight length of pipe - located correctly etc.	N/A
20	All deficiencies recorded on punch list.	Success JAN 09 2017

QC Inspector Signature: TASHA McDONALD *Tasha McDonald*  
Print & Sign

JAN 09 2017  
Date

**ASSEMBLY TRAVEL SHEET**

ENVISION MANUFACTURING & SUPPLY LTD.  
QUALITY CONTROL MANUAL

Work Order #: 16182

Customer: Paramount Resources

Date: 10/13/16

Activity	EnVision Inspection Criteria			Customer's Inspection Criteria		
	Requirement	Initial	Date	Requirement	Initial	Date
Package checked against drawings	I / D	Jueo	JAN 16 2017		h	01/17/17
Tags/name plates installed	I	Jueo	JAN 16 2017		h	01/17/17
Vessel secured to skid correctly	I	Jueo	JAN 11 2017		h	01/17/17
Holes in building walls caulked	I	Jueo	JAN 16 2017		h	01/17/17
Paint touch-ups complete	I	Jueo	JAN 16 2017		h	01/17/17
Pipe caps and plugs installed for shipping	I	Jueo	JAN 16 2017		h	01/17/17
Building stickers installed	I	Jueo	JAN 16 2017		h	01/17/17
Valves closed & handle checked for functionality	I	Jueo	JAN 16 2017		h	01/17/17
Windows and vents closed	I	Jueo	JAN 16 2017		h	01/17/17
Electrical cables secured to brackets and seals poured	I	N/A	N/A			
Low point valves opened and closed to ensure no liquid remaining from hydro-test	I	Jueo	JAN 16 2017		h	01/17/17
Underskid insulated (if required)	I	Jueo	JAN 16 2017		h	01/17/17
Man-way bolted up with gasket	I	N/A	N/A			
NCR's Rectified	N/A	N/A	N/A			
Pictures taken of completed package	I	Jueo	JAN 16 2017		h	01/17/17
All QC Package requirements completed & filed	D / R	Jueo	JAN 17 2017		h	01/17/17
Ship loose items checked as below	I	Jueo	JAN 16 2017		h	01/17/17
Ship Loost Items:						
Gas leg & bolt-up	N/A	5-valve manifold & chart recorder/MVS			N/A	
Level displacer	N/A	Tank vent & bolt-up			N/A	
Totalizer	N/A	Enviro-box			N/A	
Meter run handle	N/A	Control Panel			N/A	



H - Hold Point I - EnVision Inspection Point D - Document Required W - Witness R - Document Review

NOTES: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
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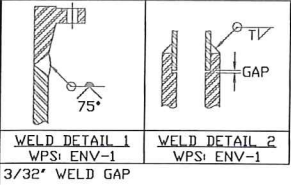
## SECTION 2

Bay 2, 3809 53<sup>rd</sup> Avenue  
Lacombe, AB  
T4L 2L6  
403.304.8314

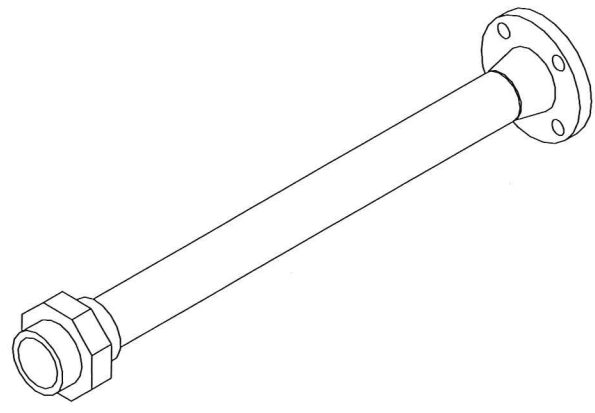
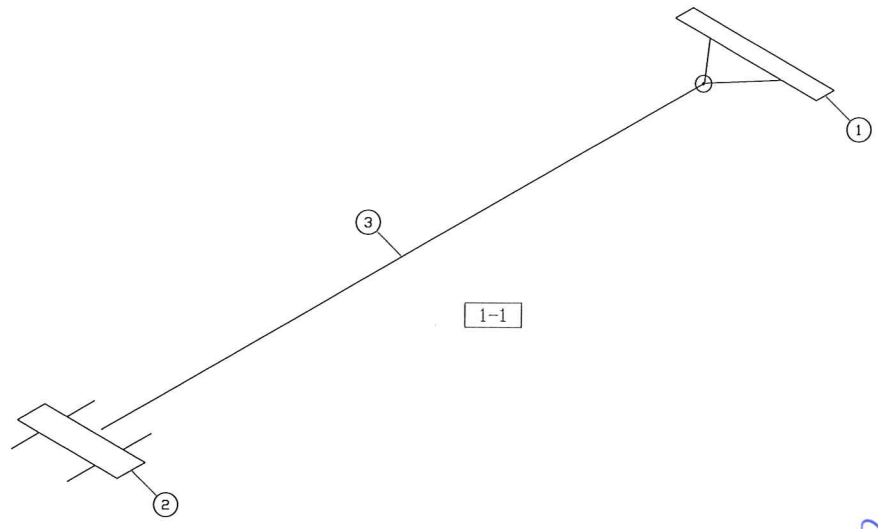
## DRAWING INDEX

ENVISION MANUFACTURING & SUPPLY LTD.  
QUALITY CONTROL MANUAL

Drawing Number	Rev No.	Drawing Title	Date Issued	Copies Submitted To:					
				QC Manager	Shop Manager	Purchasing Manager	Engineering File	ABSA	Date Submitted to ABSA
16182 DUAL-25HP-INST AIR PID	0	INSTRUMENT AIR PACKAGE 25HP DUAL INSTRUMENT AIR	2-Dec-16	✓	✓	✓	✓	-----	-----
16182 DUAL-25HP-INST AIR GA ELEV	0	INSTRUMENT AIR PACKAGE 25HP DUAL INSTRUMENT AIR	2-Dec-16	✓	✓	✓	N/A	N/A	N/A
16182 DUAL-25HP-INST AIR GA LAYOUT	0	INSTRUMENT AIR PACKAGE 25HP DUAL INSTRUMENT AIR	2-Dec-16	✓	✓	✓	N/A	N/A	N/A
16182 DUAL-25HP-INST AIR GA PLAN	0	INSTRUMENT AIR PACKAGE 25HP DUAL INSTRUMENT AIR	2-Dec-16	✓	✓	✓	N/A	N/A	N/A
16182 DUAL-25HP-INST AIR GA BUILDING	0	INSTRUMENT AIR PACKAGE 25HP DUAL INSTRUMENT AIR	2-Dec-16	✓	✓	✓	✓	N/A	N/A
16182 DUAL-25HP-INST AIR SKID	0	INSTRUMENT AIR PACKAGE 25HP DUAL INSTRUMENT AIR	2-Dec-16	✓	✓	✓	N/A	N/A	N/A
16182 DUAL25HP-INST AIR SPOOL	0	INSTRUMENT AIR PACKAGE 25HP DUAL INSTRUMENT AIR	2-Dec-16	✓	✓	✓	N/A	N/A	N/A
16182 DUAL-25HP-INST AIR PID	1	INSTRUMENT AIR PACKAGE 25HP DUAL INSTRUMENT AIR	10-Dec-16	✓	✓	✓	✓	✓	12-Dec-16
16182 DUAL-25HP-INST AIR GA ELEV	1	INSTRUMENT AIR PACKAGE 25HP DUAL INSTRUMENT AIR	10-Dec-16	✓	✓	✓	N/A	N/A	N/A
16182 DUAL-25HP-INST AIR GA LAYOUT	1	INSTRUMENT AIR PACKAGE 25HP DUAL INSTRUMENT AIR	10-Dec-16	✓	✓	✓	N/A	N/A	N/A
16182 DUAL-25HP-INST AIR GA PLAN	1	INSTRUMENT AIR PACKAGE 25HP DUAL INSTRUMENT AIR	10-Dec-16	✓	✓	✓	N/A	N/A	N/A
16182 DUAL-25HP-INST AIR GA BUILDING	1	INSTRUMENT AIR PACKAGE 25HP DUAL INSTRUMENT AIR	10-Dec-16	✓	✓	✓	✓	N/A	N/A
16182 DUAL-25HP-INST AIR SKID	1	INSTRUMENT AIR PACKAGE 25HP DUAL INSTRUMENT AIR	10-Dec-16	✓	✓	✓	N/A	N/A	N/A
16182 DUAL25HP-INST AIR SPOOL	1	INSTRUMENT AIR PACKAGE 25HP DUAL INSTRUMENT AIR	10-Dec-16	✓	✓	✓	N/A	N/A	N/A
16182 DUAL-25HP-INST AIR PID	2	INSTRUMENT AIR PACKAGE 25HP DUAL INSTRUMENT AIR	13-Jan-17	✓	N/A	N/A	N/A	N/A	N/A



BILL OF MATERIALS									
ITEM	QTY	PN	SIZE	DESCRIPTION	MATERIAL	LENGTH		HEAT #	
1	1	-	2'	FLANGE - CL150 RFWN x SCH.40	SA-350-LF2	-	-	-	-
2	1	-	2'	UNION - CL3000 THRD x SW	SA-105-N	-	-	-	-
3	1	-	2'	PIPE - SMLS x SCH.40	SA-333-GR6	2'-1 5/16'	642mm	-	-



Job # 16182  
 Issued For  
**DEC 02 2016**  
 Construction  
 Jucp

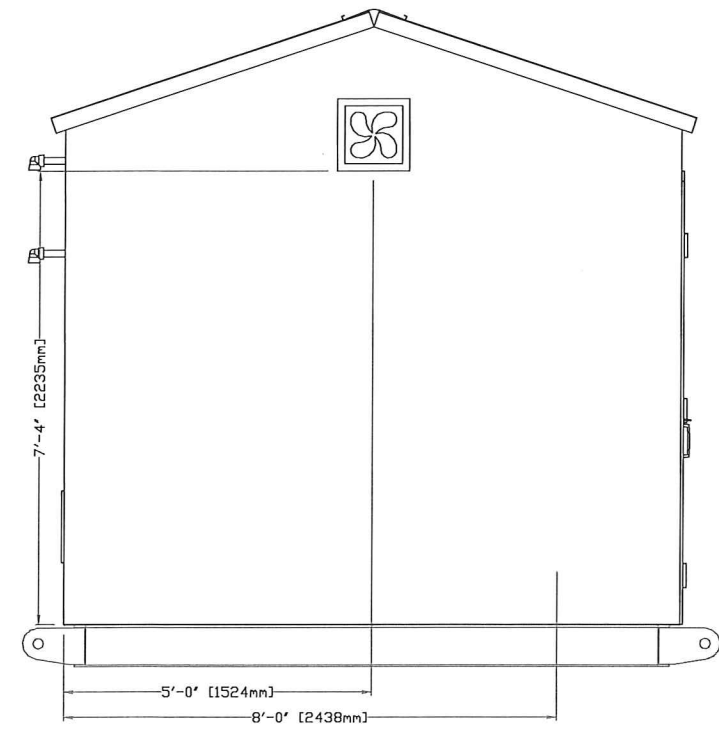
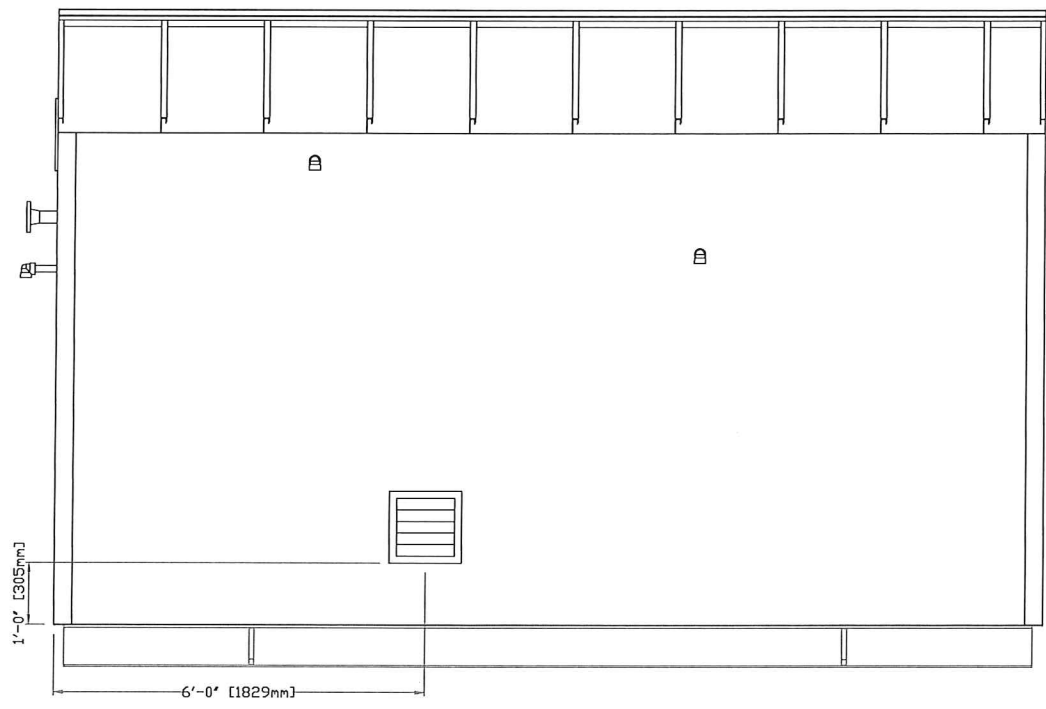
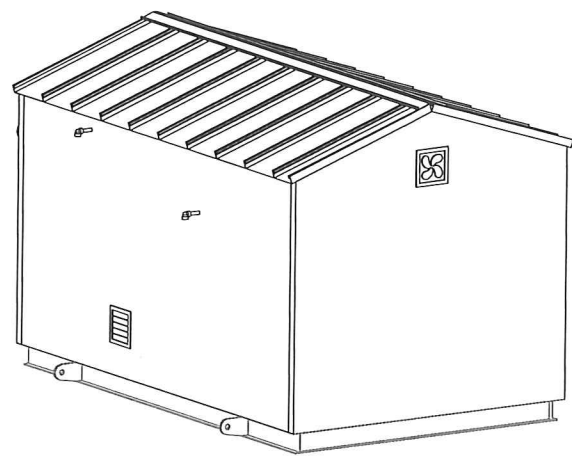
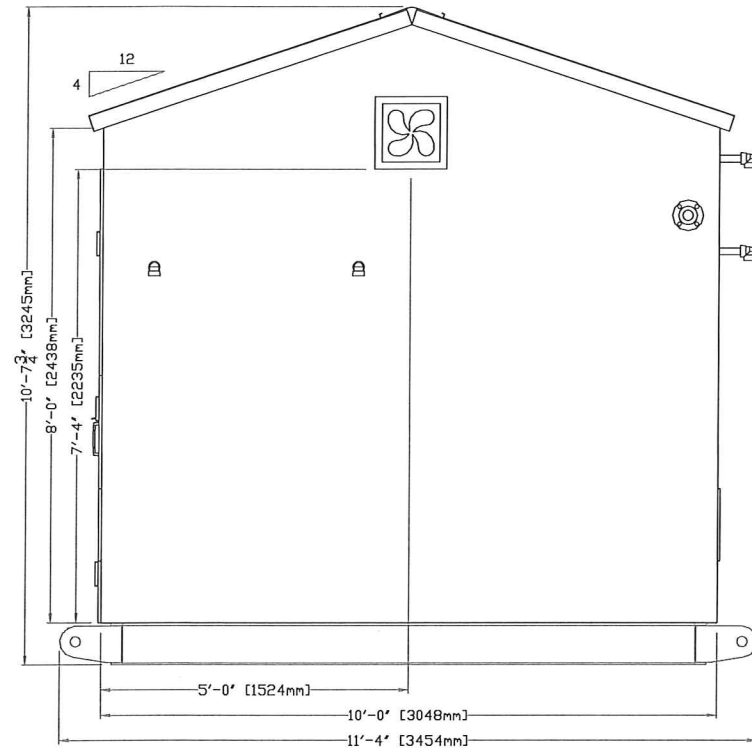
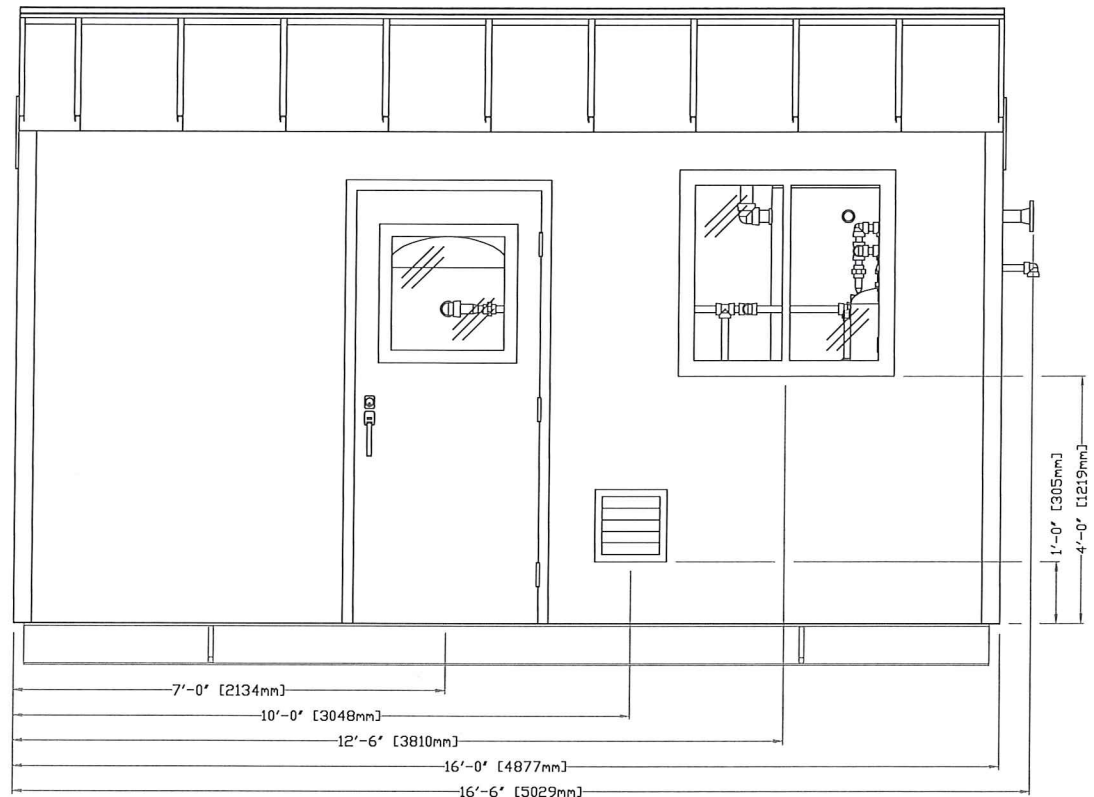
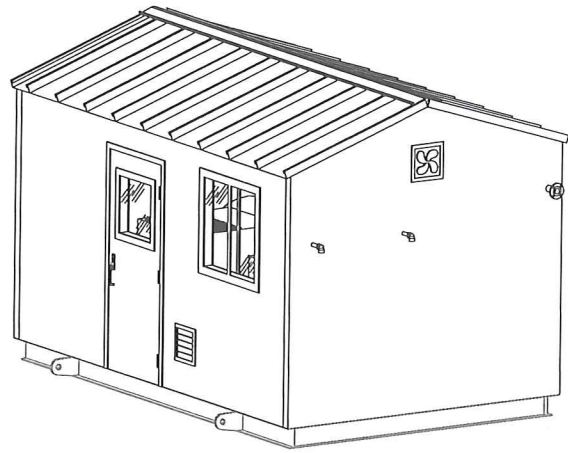
DESIGN DATA	
DESIGN PRESSURE:	225 PSI
CORROSION ALLOWANCE:	1/16"
RADIOGRAPHY:	10%
PWHT:	N/A
HYDROTEST:	398 PSI
WPS:	3603.2
AQP:	1584

REV	DD/MM/YYYY	REVISION	DF	NM	TB	BY	CHK	APP
0	29/11/2016	ISSUED FOR CONSTRUCTION						



CLIENT: PARAMOUNT RESOURCES c/o GAS LIQUIDS ENGINEERING		
INSTRUMENT AIR PACKAGE		
20HP DUAL INSTRUMENT AIR		
PART#	DWG#	REV
XXXX	16182 DUAL-25HP-INST AIR SPOOL	0

**BUILDING NOTES**  
 SELF FRAMING  
 R12 WALLS, R20 ROOF  
 STONE GREY EXTERIOR, WHITE INTERIOR  
 16'-0" LONG x 10'-0" WIDE  
 8'-0" EAVE HEIGHT, 4:12 PITCH  
 1 - 3'x7' MAN DOOR, c/w PANIC HARDWARE, GPW WINDOW, CHECK CHAIN & RETAINER  
 1 - 40" x 40" SLIDING WINDOW c/w SCREEN  
 2 - 12" x 12" LOUVERS  
 2 - ET12-1 EXHAUST FANS



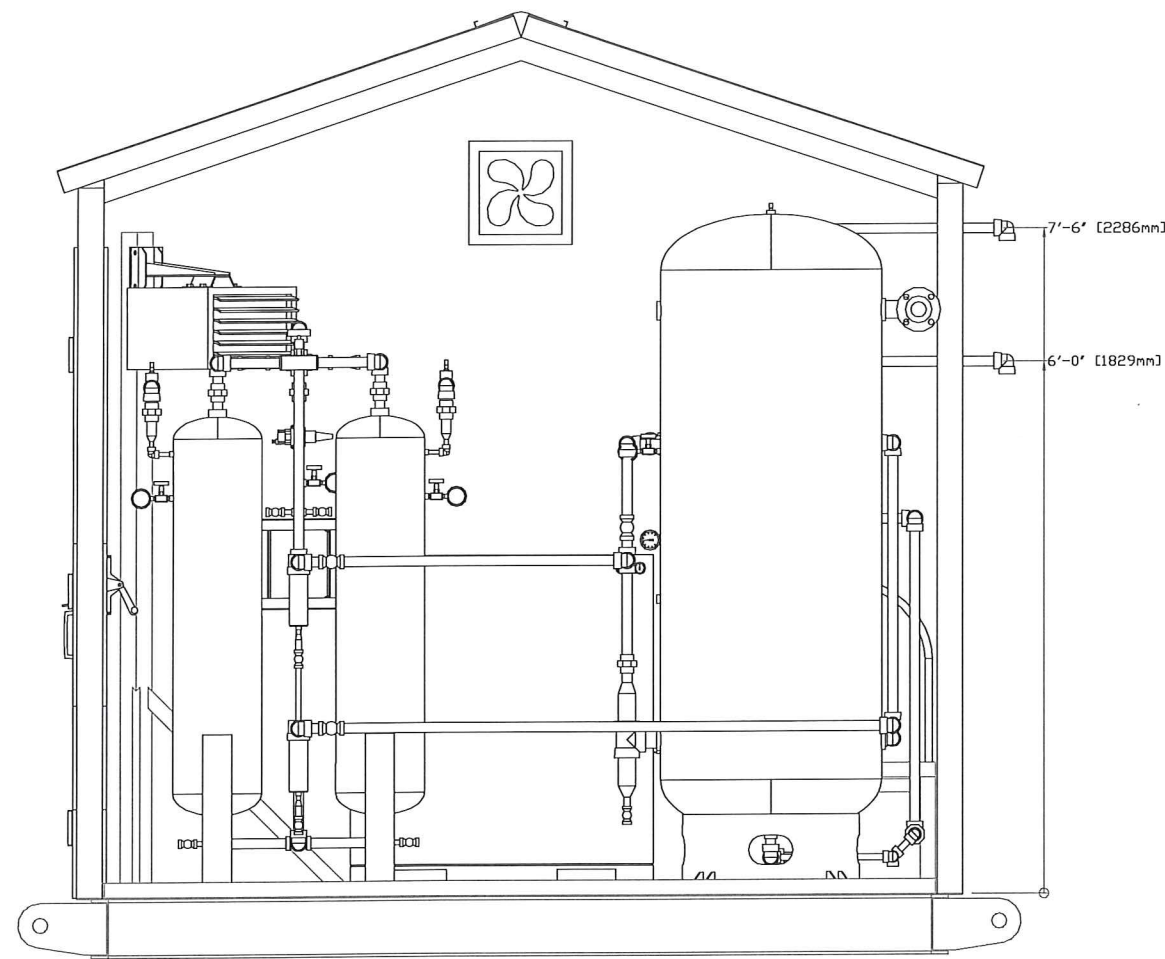
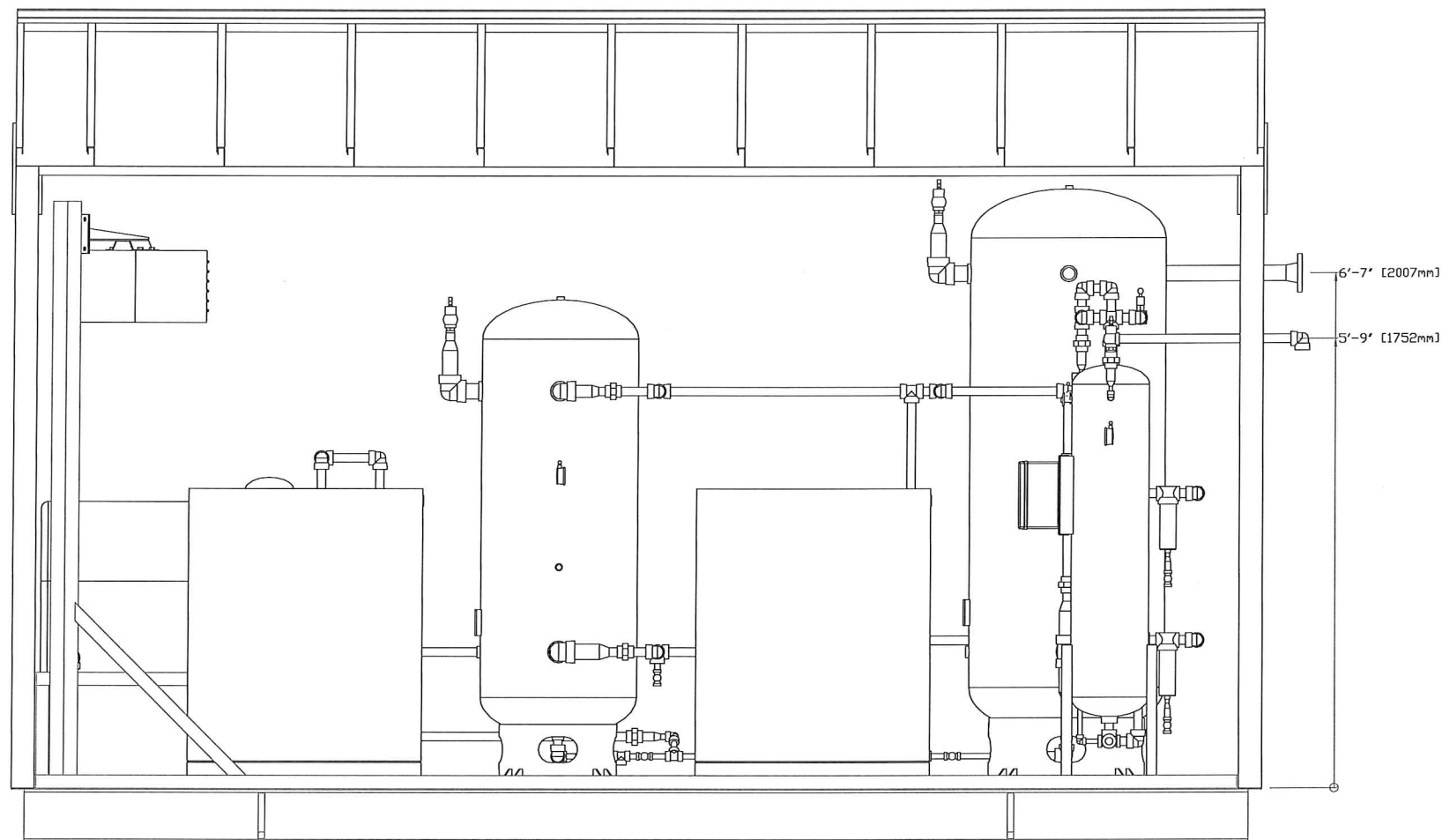
Job# 16182  
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 Construction  
*Juan*

**SHIPPING INFORMATION**  
 LENGTH: 16'-6"  
 WIDTH: 11'-4"  
 HEIGHT: 10'-7 3/4"  
 APPROXIMATE PACKAGE WEIGHT: 14,000 LBS

REV	DD/MM/YYYY	REVISION	BY	CHK	APP
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CLIENT: PARAMOUNT RESOURCES c/o GAS LIQUIDS ENGINEERING  
**INSTRUMENT AIR PACKAGE**  
 20HP DUAL INSTRUMENT AIR  
 PART# DWG#  
 XXXX 16182 DUAL-25HP-INST AIR GA BUILDING  
 REV 0



Job# 16182  
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*[Signature]*

REV	DD/MM/YYYY	REVISION	BY	CHK	APP
0	29/11/2016	ISSUED FOR CONSTRUCTION	DF	NM	TB

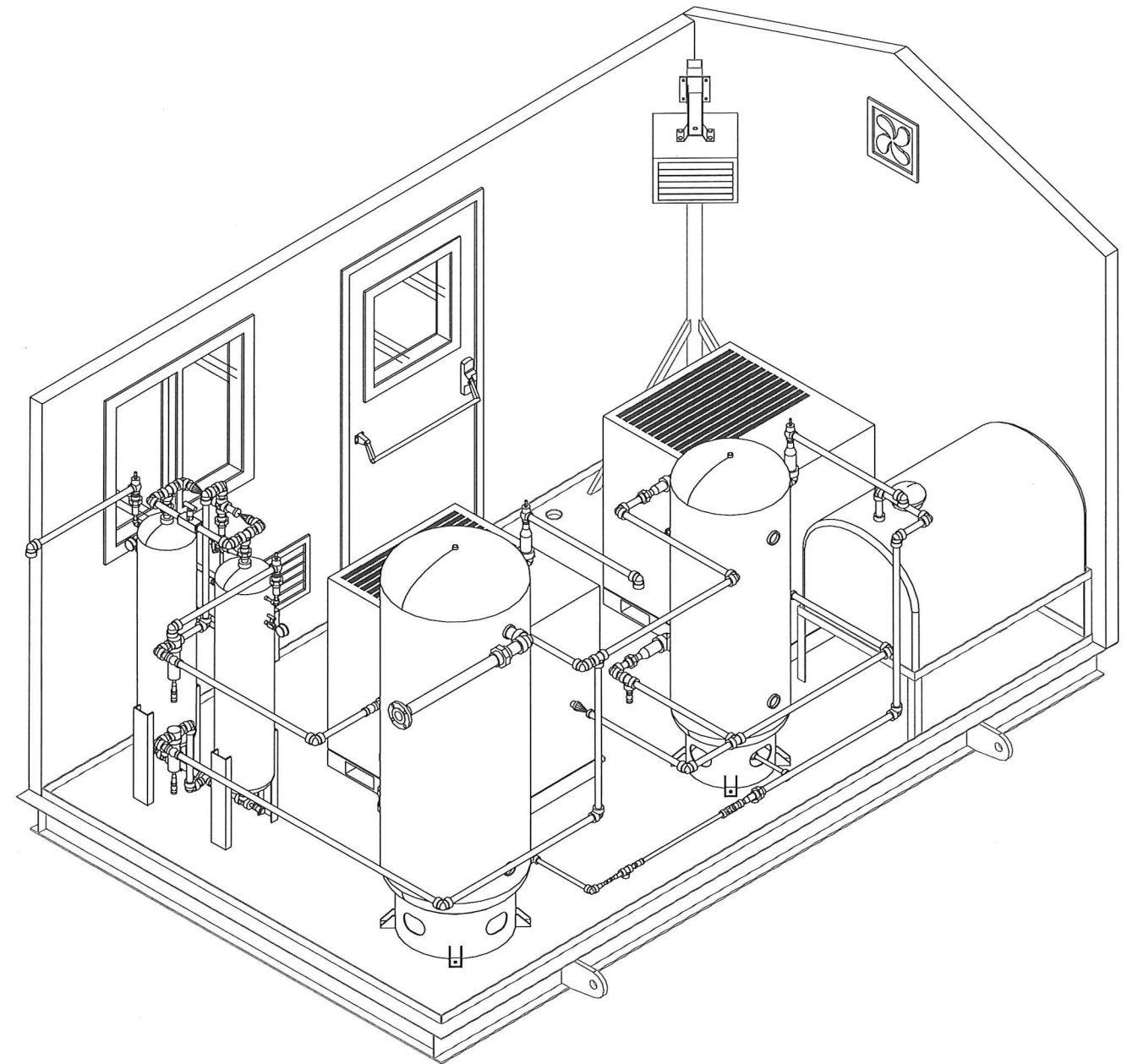
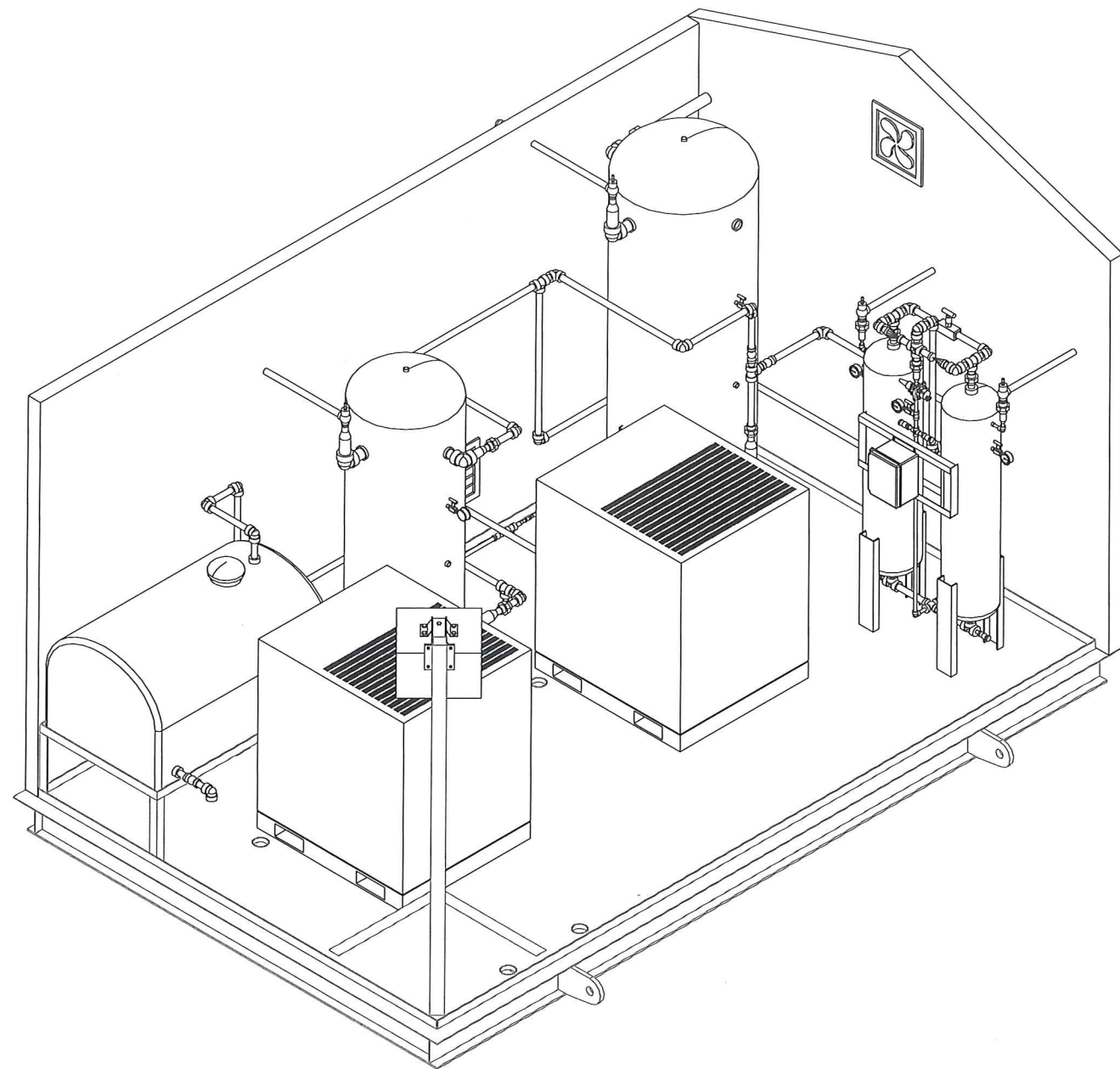


CLIENT: PARAMOUNT RESOURCES c/o GAS LIQUIDS ENGINEERING

**INSTRUMENT AIR PACKAGE**  
 20HP DUAL INSTRUMENT AIR

PART#	DWGH	REV
XXXX	16182 DUAL-25HP-INST AIR GA ELEV	0



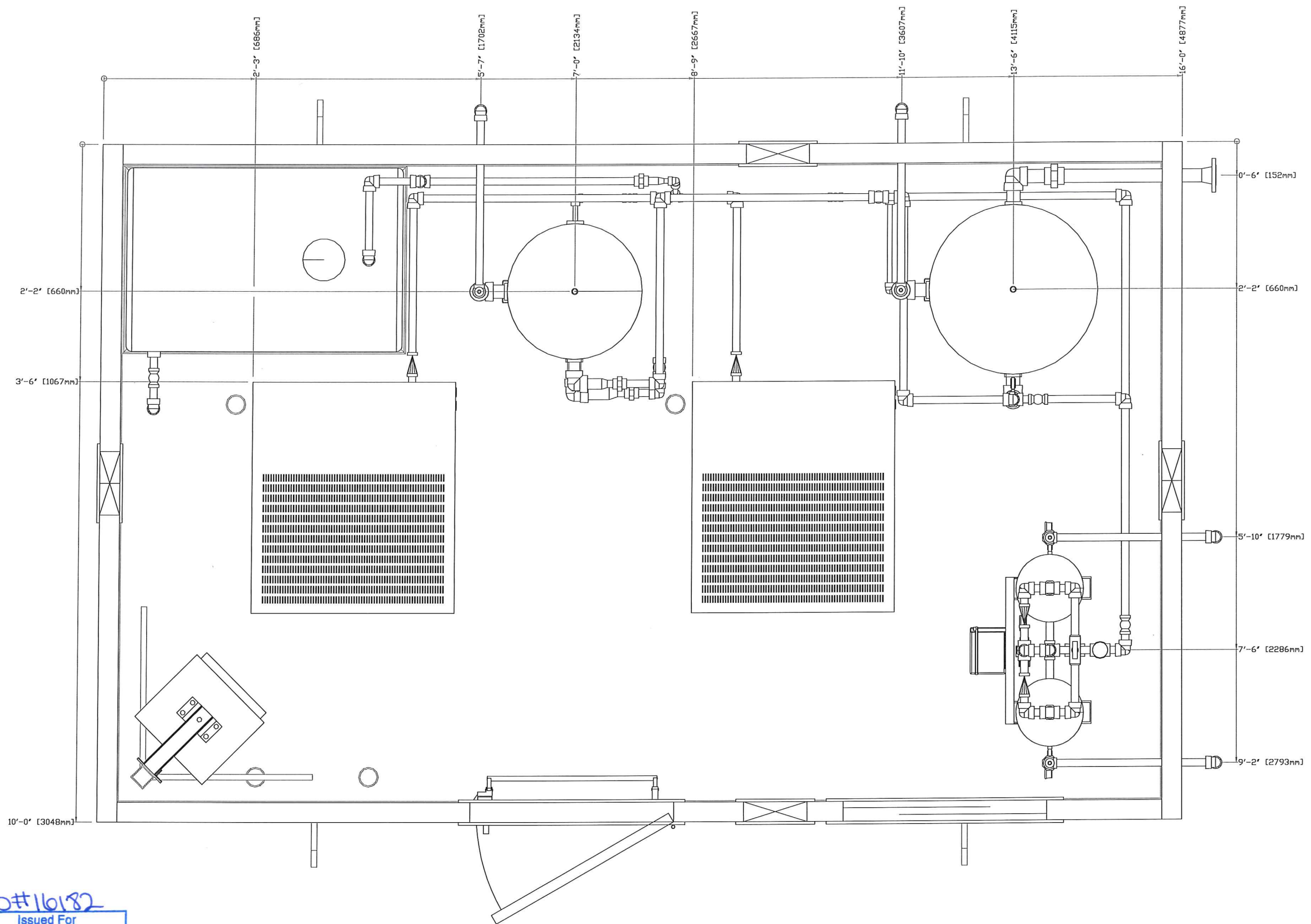


Job# 16182  
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 Suez

REV	DD/MM/YYYY	REVISION	BY	CHK	APP
0	29/11/2016	ISSUED FOR CONSTRUCTION	DF	NM	TB



CLIENT: PARAMOUNT RESOURCES c/o GAS LIQUIDS ENGINEERING	
INSTRUMENT AIR PACKAGE 20HP DUAL INSTRUMENT AIR	
PART# XXXX	DWG# 16182 DUAL-25HP-INST AIR GA LAYOUT
REV 0	



Job # 16182  
 Issued For  
**DEC 02 2016**  
 Construction  
*Pucco*

REV	DD/MM/YYYY	REVISION	BY	CHK	APP
0	29/11/2016	ISSUED FOR CONSTRUCTION	DF	NM	TB



CLIENT: PARAMOUNT RESOURCES c/o GAS LIQUIDS ENGINEERING			
<b>INSTRUMENT AIR PACKAGE</b>			
20HP DUAL INSTRUMENT AIR			
PART#	DWGH	REV	
XXXX	16182 DUAL-25HP-INST AIR GA PLAN	0	

**K-2231-01/02**  
**AIR COMPRESSOR**  
 PART# ROTORCOMP RS25ENC  
 110 CM/HR @ 1310 kPa  
 MAWP: 1448 kPa  
 MADP: 1310 kPa  
 c/w 25HP MOTOR 3600RPM

**V-2231-03**  
**WET AIR RECEIVER**  
 PART# VERTICAL  
 MAWP: 2068 kPa @ 204°C  
 NDMT: -20°F @ 2068 kPa  
 120 GAL., 24" Ø x 67" LG.

**V-2231-07**  
**DRY AIR RECEIVER**  
 PART# VERTICAL  
 MAWP: 2068 PSIG @ 204°C  
 NDMT: -29°C @ 1379 kPa  
 240 GAL., 30" Ø x 84" LG.

**D-2231-04**  
**HEATLESS AIR DRYER**  
 PART# 119 CM/HR @ 1310 kPa  
 120V/1PH/60Hz  
 MAWP: 2068 kPa  
 S/N: TBA

**F-2231-05**  
**PRE-FILTER**  
 COALESCER JC0085-C  
 172 CM/HR @ 1310 kPa  
 MAWP: 3447 kPa  
 0.01 MICRON FILTER  
 c/w INTEGRAL FLOAT DRAIN

**F-2231-06**  
**AIR FILTER**  
 PARTICULATE JC0085-F  
 287 CM/HR @ 1310 kPa  
 MAWP: 3447 kPa  
 0.9 MICRON FILTER  
 MANUAL DRAIN

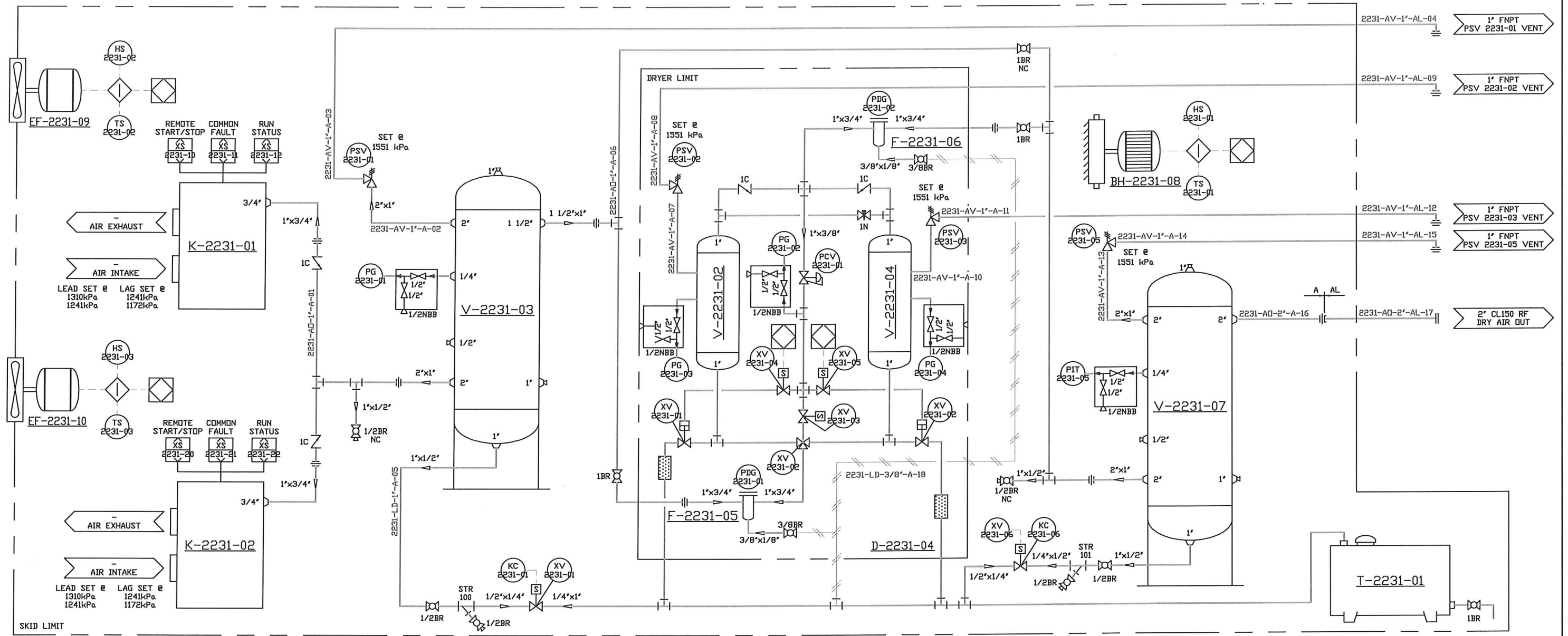
**BH-2231-08**  
**BUILDING HEATER**  
 PART# 2578  
 CALDRITECH  
 MODEL GE107CT480  
 10KW  
 480 VOLT, 3 PHASE

**EF-2231-09/10**  
**EXHAUST FAN**  
 ET12-1  
 120 VOLT, 1 PHASE  
 1/4HP  
 120V/1/60Hz  
 c/w HOOD

**V-2231-02/04**  
**AIR DRYER**  
 NORTHWEST NW75  
 CAPACITY: 27 CM/HR @ 689 kPa  
 MAWP: 2068 kPa  
 MAX INLET TEMP: 49°C

**T-2231-01**  
**LOAD TANK**  
 PLASTIC  
 CAPACITY: 379 LITRES  
 406mm VENTED LID  
 826mm WIDE x 711mm HIGH x 1245mm LONG

BILL OF MATERIALS				
TAG	QTY	PN	DESCRIPTION	
PSV-2231-01/2/3/5	4	2572	PRESSURE SAFETY VALVE, MERCER, 1" x 1"NPT, SET @ 1551kPa	
PG-2231-01/3/4/5	4	1405	PRESSURE GAUGE, WIKA, 0-300PSI, 4" DIAL x 1/2"NPT, LOWER MOUNT	
STR-100/101	2	2284	Y-STRAINER, ALTA STRAINERS, 1/2"FNPT, 2000CL	
XV-2231-01/6	2	-	SOLENOID VALVE, ASCO, 8262H202, 1/4"NPT, 2-WAY VALVE	
KC-2231-01/6	2	-	ELECTRIC TIMER, ASCO, 2-40 SECOND TIMER DN, 30 SECOND TO 45 MINUTE OFF	
PDG-2231-01/2	2	-	DIFFERENTIAL PRESSURE INDICATOR, c/w F-101, F-202	
XV-2231-03/4/5	3	-	EXHAUST SOLENOID VALVE, AIRTEK	
XY-2231-02	1	-	INLET PILOT SOLENOID VALVE, AIRTEK 3-WAY, c/w DRYER	
XV-2231-01/2	2	-	EXHAUST PILOT VALVE, c/w DRYER ASSEMBLY	
PCV-2231-01	1	-	PURGE REGULATOR, PNEUMATIC, 1/2"NPT, 1724kPa MAX, 79°C, SET @ 207kPa	
1BR	4	2291	1" NPT BALL VALVE, KF, REG PORT, 2000CL	
1/2BR	5	2290	1/2" NPT BALL VALVE, KF, REG PORT, 2000CL	
3/8BR	2	2289	3/8" NPT BALL VALVE, KF, REG PORT, 2000CL	
1C	4	2071	1" NPT CHECK VALVE, 2160CL	
1N	1	2573	1" NPT NEEDLE VALVE	
1/2NBB	5	-	1/2" BLOCK AND BLEED NEEDLE VALVE, CENTURY, CM26R-1M44TCNT	



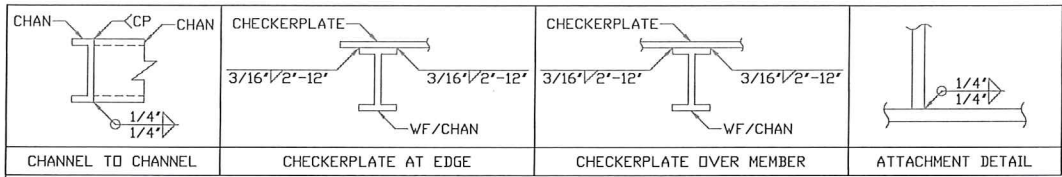
Job # 16182  
 Issued For  
 DEC 02 2016  
 Construction  
 [Signature]

**PIPING NOTES**  
 THREADED PIPE: 2" AND UNDER TO BE SA-106-GRB SCH.80  
 THRD FITTINGS: CL2000 SA-105N  
 TUBING: 3/8" 316 SS WELDED 0.035 WALL  
 1/2" 316 SS WELDED 0.049 WALL  
 TUBING FITTINGS: SWAGelok SS

**GENERAL NOTES**  
 BUILDING: 10' 0" WIDE, 16' 0" LONG, SELF FRAMING  
 EAVE HEIGHTS: 8' 0" EAVE HEIGHT, 4/12 PITCH  
 BUILDING COLOUR: STONE GREY EXTERIOR, WHITE INTERIOR  
 PIPING COLOUR: GREY  
 SKID: 10' 0" WIDE, 16' 0" LONG  
 ELECTRICAL: ALL BY OTHERS

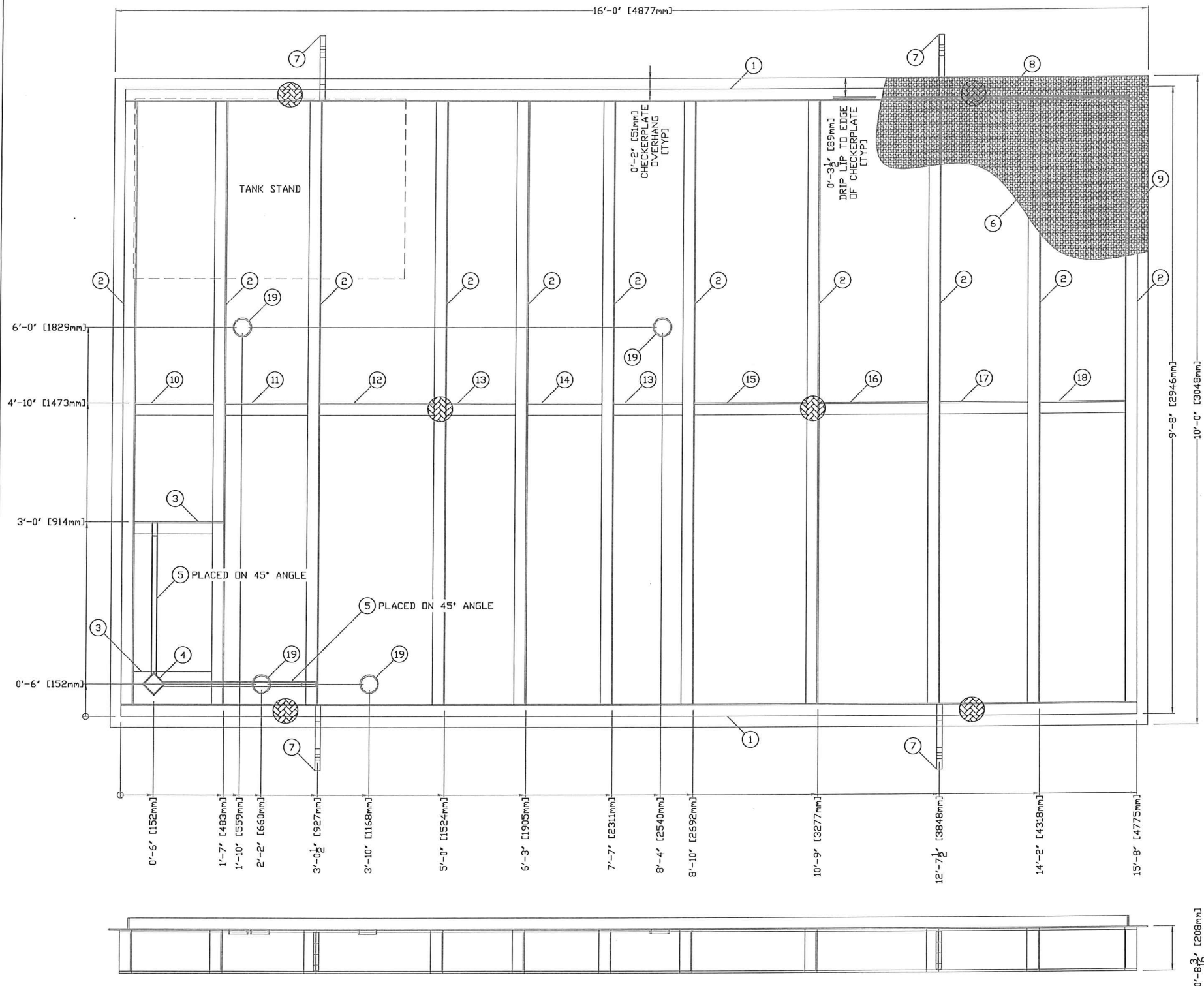
CLIENT: PARAMOUNT RESOURCES c/o GAS LIQUIDS ENGINEERING			INSTRUMENT AIR PACKAGE		
20HP DUAL INSTRUMENT AIR			PART# DWG#		
XXXX 16182 DUAL-25HP-INST AIR PID			REV 0		
0	29/11/2016	ISSUED FOR CONSTRUCTION	DF	NM	TB
REV	DD/MM/YYYY	REVISION	BY	CHK	APP



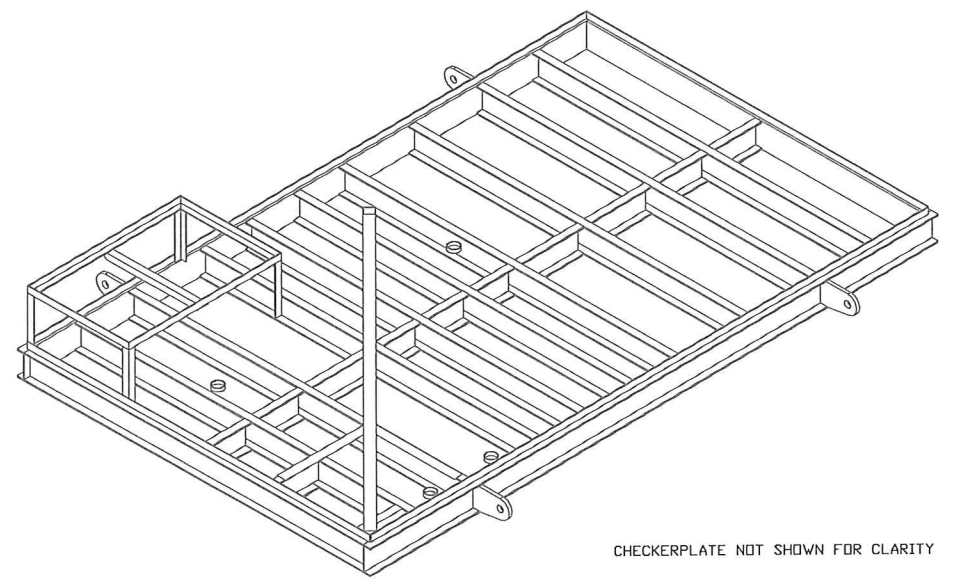
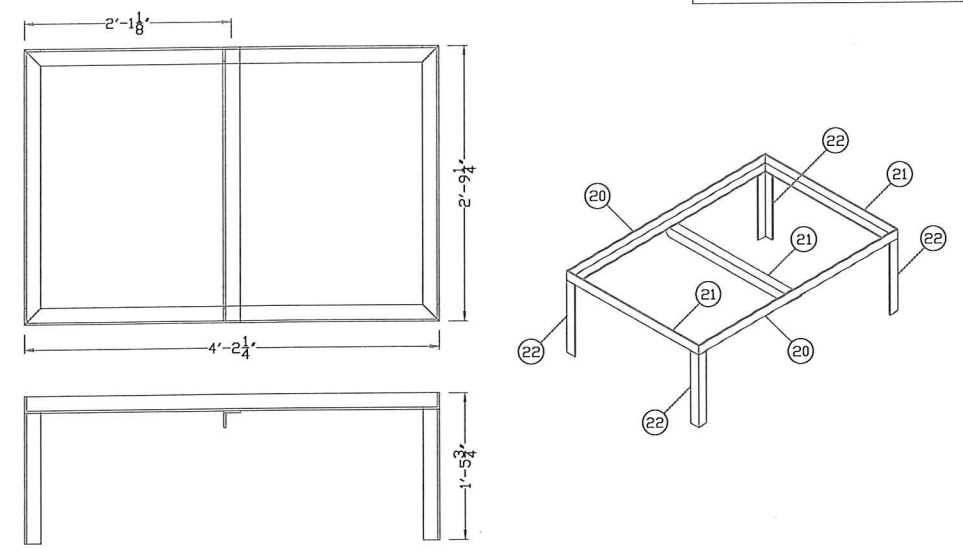


Job# 16182  
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 DEC 02 2016  
 Construction  
 Jucp

BILL OF MATERIALS					
ITEM	QTY	PN	DESCRIPTION	LENGTH	MATERIAL
1	2	1074	CHANNEL - C8 x 11.5#	15'-8"	SA36-44W
2	11	1074	CHANNEL - C8 x 11.5#	9'-3 1/2"	SA36-44W
3	2	1074	CHANNEL - C8 x 11.5#	1'-4 1/2"	SA36-44W
4	1	1454	HSS - 3" x 3" x 1/4"WALL	7'-6"	SA36-44W
5	2	1452	HSS - 2" x 1" x 1/8"WALL	3'-3 5/8"	SA36-44W
6	1	1664	CHECKERPLATE - 10'-0" x 16'-0" x 3/16"THK	-	SA36-44W
7	4	1475	LUGS - 7" x 12" x 1"THK	-	SA36-44W
8	2	1325	FLATBAR - 2" x 1/4"	15'-4 1/2"	SA36-44W
9	2	1325	FLATBAR - 2" x 1/4"	9'-4 1/2"	SA36-44W
10	1	1074	CHANNEL - C8 x 11.5#	1'-2 1/2"	SA36-44W
11	1	1074	CHANNEL - C8 x 11.5#	1'-3 1/4"	SA36-44W
12	1	1074	CHANNEL - C8 x 11.5#	1'-9 1/4"	SA36-44W
13	2	1074	CHANNEL - C8 x 11.5#	1'-0 3/4"	SA36-44W
14	1	1074	CHANNEL - C8 x 11.5#	1'-1 3/4"	SA36-44W
15	1	1074	CHANNEL - C8 x 11.5#	1'-8 3/4"	SA36-44W
16	1	1074	CHANNEL - C8 x 11.5#	1'-8 1/4"	SA36-44W
17	1	1074	CHANNEL - C8 x 11.5#	1'-4 1/4"	SA36-44W
18	1	1074	CHANNEL - C8 x 11.5#	1'-3 3/4"	SA36-44W
19	4	-	PIPE - 3" SCH.STD	0'-1"	SA-106B
20	2	-	ANGLE - 2" x 2" x 1/4"	4'-2 1/2"	SA36-44W
21	3	-	ANGLE - 2" x 2" x 1/4"	2'-9 1/4"	SA36-44W
22	4	-	ANGLE - 2" x 2" x 1/4"	1'-3 3/4"	SA36-44W



APPROXIMATE SKID WEIGHT: 3,000 LBS



CHECKERPLATE NOT SHOWN FOR CLARITY

SKID NOTES  
 2" URETHANE INSULATION ON UNDERSIDE OF SKID  
 ⊗ = SUGGESTED PILE LOCATIONS

REV	DATE	DESCRIPTION	BY	CHK	APP
0	29/11/2016	ISSUED FOR CONSTRUCTION	DF	NM	TB
REV	DD/MM/YYYY	REVISION	BY	CHK	APP



CLIENT: PARAMOUNT RESOURCES c/o GAS LIQUIDS ENGINEERING  
 INSTRUMENT AIR PACKAGE  
 20HP DUAL INSTRUMENT AIR  
 PART# DWG#  
 XXXX 16182 DUAL-25HP-INST AIR SKID  
 REV 0

**K-2231-01/02**  
**AIR COMPRESSOR**  
 PART# ROTORCOMP RS25ENC  
 110 CM/HR @ 1310 kPa  
 MAWP: 1448 kPa  
 MADP: 1310 kPa  
 c/w 25HP MOTOR 3600RPM

**V-2231-03**  
**WET AIR RECEIVER**  
 PART# VERTICAL  
 MAWP: 2068 kPa @ 204°C  
 MDMT: -20°F @ 2068 kPa  
 120 GAL., 24" Ø x 67" LG.

**V-2231-07**  
**DRY AIR RECEIVER**  
 PART# VERTICAL  
 MAWP: 2068 kPa @ 204°C  
 MDMT: -29°C @ 1379 kPa  
 240 GAL., 30" Ø x 84" LG.

**D-2231-04**  
**HEATLESS AIR DRYER**  
 PART# 119 CM/HR @ 1310 kPa  
 120V/1PH/60Hz  
 MAWP: 2068 kPa  
 S/N: TBA

**F-2231-05**  
**PRE-FILTER**  
 COALESCER JC0085-C  
 172 CM/HR @ 1310 kPa  
 MAWP: 3447 kPa  
 0.01 MICRON FILTER  
 c/w INTEGRAL FLOAT DRAIN

**F-2231-06**  
**AIR FILTER**  
 PARTICULATE JC0085-F  
 287 CM/HR @ 1310 kPa  
 MAWP: 3447 kPa  
 0.9 MICRON FILTER  
 MANUAL DRAIN

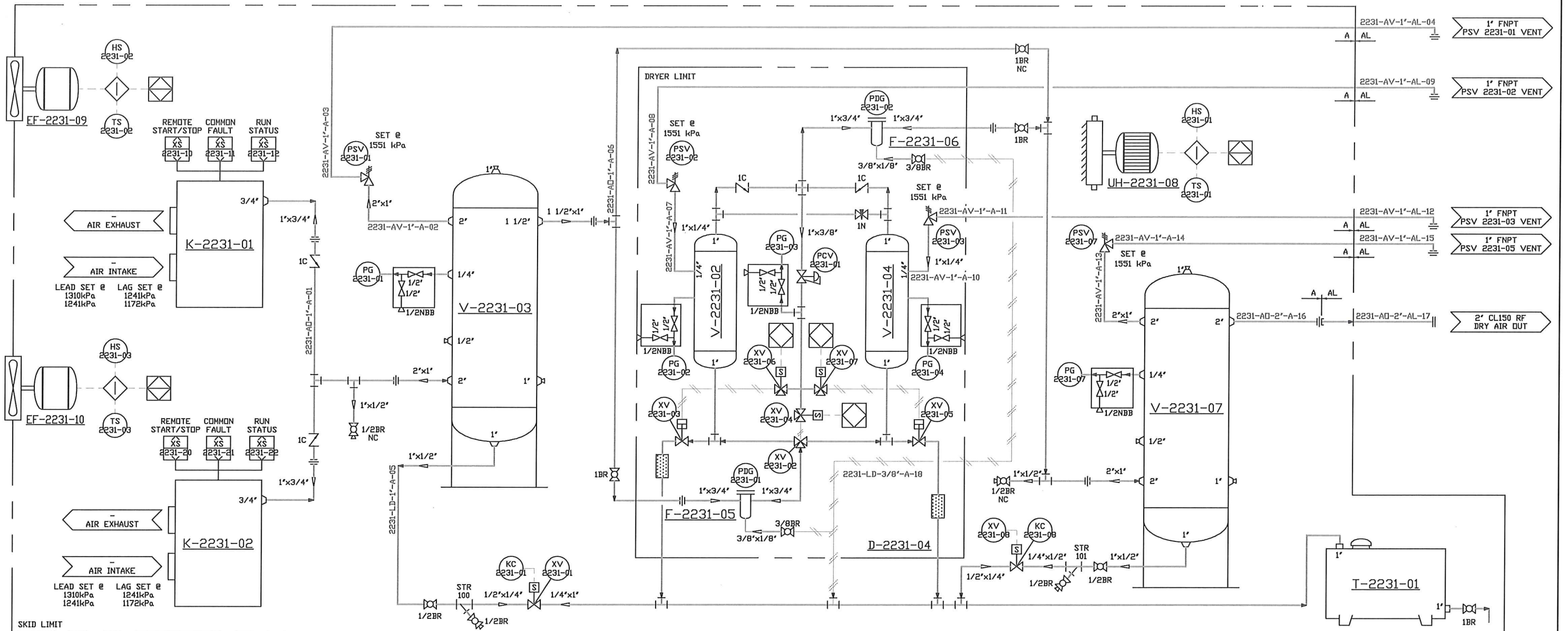
**UH-2231-08**  
**BUILDING HEATER**  
 PART# 2578  
 CALORITECH  
 MODEL GE107CT480  
 10KW  
 480 VOLT, 3 PHASE

**EF-2231-09/10**  
**EXHAUST FAN**  
 ET12-1  
 120 VOLT, 1 PHASE  
 1/4HP  
 120V/1/60Hz  
 c/w HOOD

**V-2231-02/04**  
**AIR DRYER**  
 NORTHWEST NW75  
 CAPACITY: 127 CM/HR @ 689 kPa  
 MAWP: 2068 kPa  
 MAX INLET TEMP: 49°C

**T-2231-01**  
**LOAF TANK**  
 PLASTIC  
 CAPACITY: 379 LITRES  
 406mm VENTED LID  
 826mm WIDE x 711mm HIGH x 1245mm LONG

BILL OF MATERIALS				
TAG	QTY	PN	DESCRIPTION	
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STR-100/101	2	2284	Y-STRAINER, ALTA STRAINERS, 1/2"FNPT, 2000CL	
XV-2231-01/8	2	-	SOLENOID VALVE, ASCO, Ø262H202, 1/4"NPT, 2-WAY VALVE	
KC-2231-01/8	2	-	ELECTRIC TIMER, ASCO, 2-40 SECOND TIMER DN, 30 SECOND TO 45 MINUTE OFF	
PDG-2231-01/2	2	-	DIFFERENTIAL PRESSURE INDICATOR, c/w F-101, F-202	
XV-2231-04/6/7	3	-	EXHAUST SOLENOID VALVE, AIRTEK	
XV-2231-02	1	-	INLET PILOT SOLENOID VALVE, AIRTEK 3-WAY, c/w DRYER	
XV-2231-03/5	2	-	EXHAUST PILOT VALVE, c/w DRYER ASSEMBLY	
PCV-2231-01	1	-	PURGE REGULATOR, PNEUMATIC, 1/2"NPT, 1724kPa MAX, 79°C, SET @ 207kPa	
1BR	4	2291	1" NPT BALL VALVE, KF, REG PORT, 2000CL	
1/2BR	6	2290	1/2" NPT BALL VALVE, KF, REG PORT, 2000CL	
3/8BR	2	2289	3/8" NPT BALL VALVE, KF, REG PORT, 2000CL	
1C	4	2071	1" NPT CHECK VALVE, 2160CL	
1N	1	2573	1" NPT NEEDLE VALVE	
1/2NBB	5	-	1/2" BLOCK AND BLEED NEEDLE VALVE, CENTURY, CM26R-1M44TCNT	



Job# 16182  
 Issued For  
**DEC 10 2016**  
 Construction  
*[Signature]*

**PIPING NOTES**  
 THREADED PIPE: 2" AND UNDER TO BE SA-106-GRB SCH.80  
 THRD FITTINGS: CL3000 SA-105N  
 TUBING: 3/8" 316 SS WELDED 0.035 WALL  
 TUBING FITTINGS: SWAGelok SS

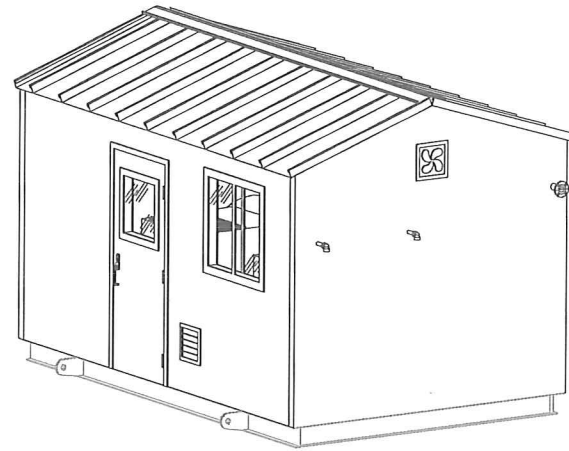
**GENERAL NOTES**  
 BUILDING: 10' 0" WIDE, 16' 0" LONG, SELF FRAMING  
 EAVE HEIGHTS: 8' 0" EAVE HEIGHT, 4:12 PITCH  
 BUILDING COLOUR: STONE GREY EXTERIOR, WHITE INTERIOR  
 PIPING COLOUR: GREY  
 SKID: 10' 0" WIDE, 16' 0" LONG  
 ELECTRICAL: ALL BY OTHERS

REV	DD/MM/YYYY	REVISION	BY	CHK	APP
1	09/12/2016	ADD LINE #'S, REVISED TAG #'S AS PER CUSTOMER NOTES	DF	NM	TB
0	29/11/2016	ISSUED FOR CONSTRUCTION	DF	NM	TB

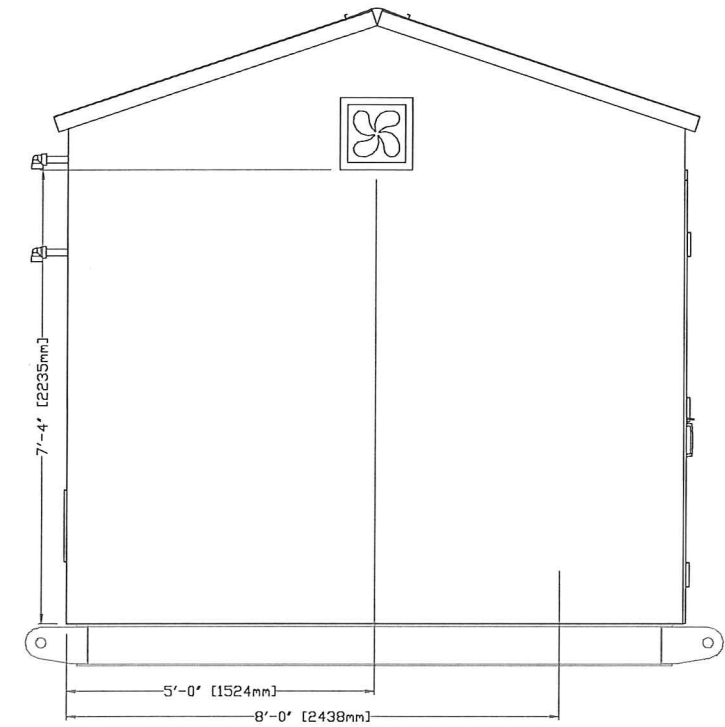
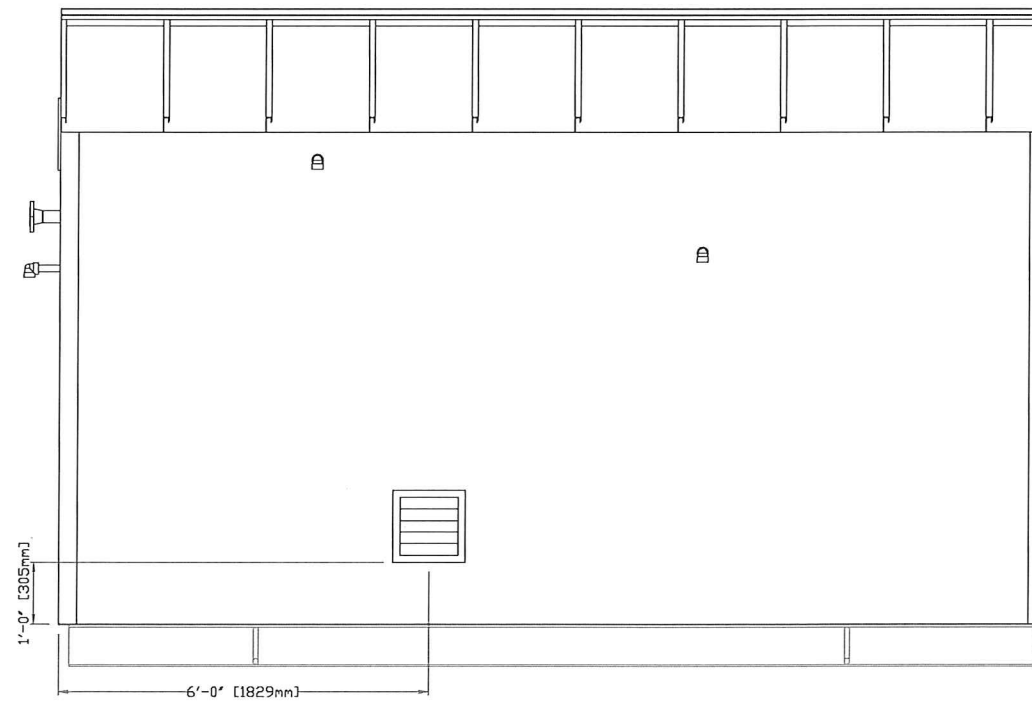
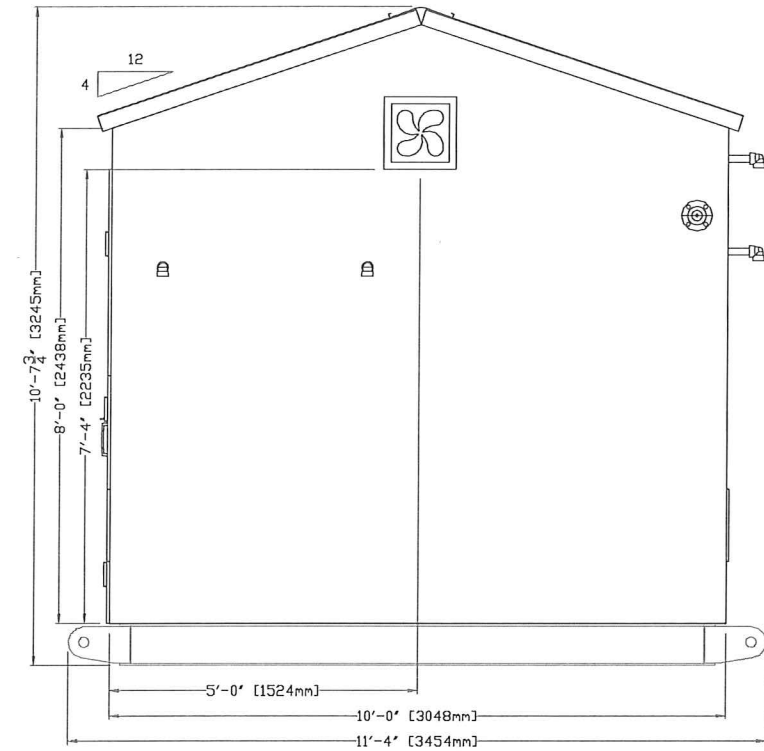
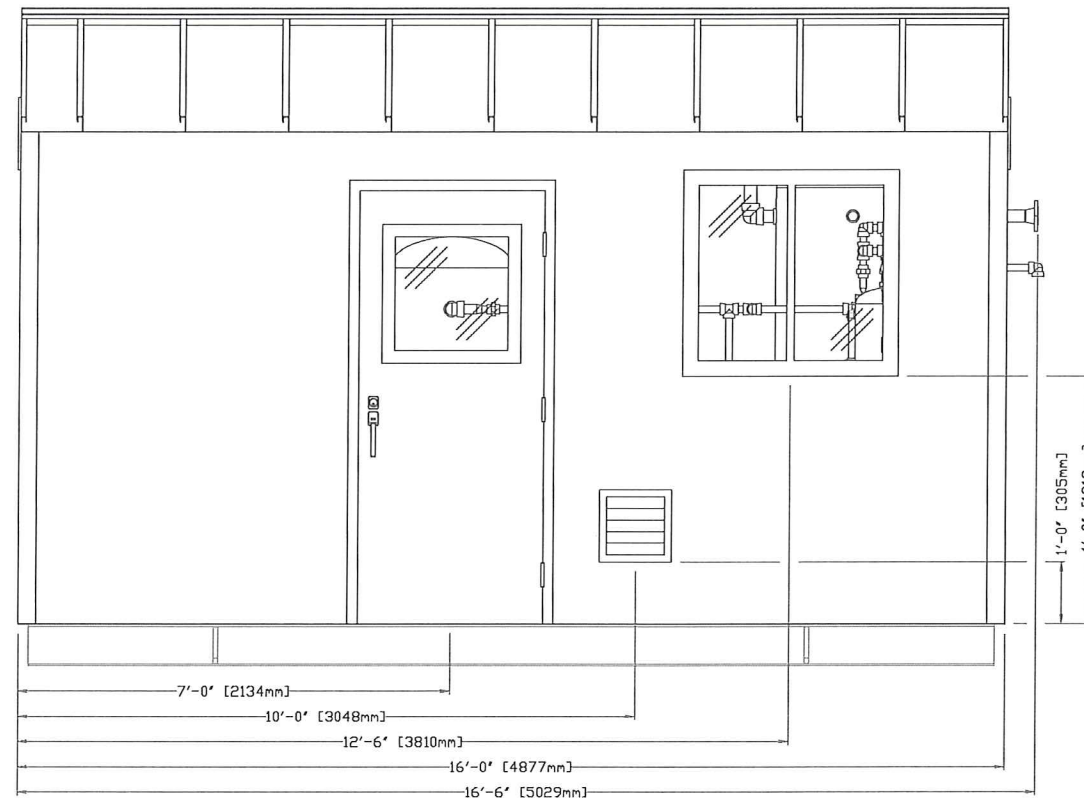
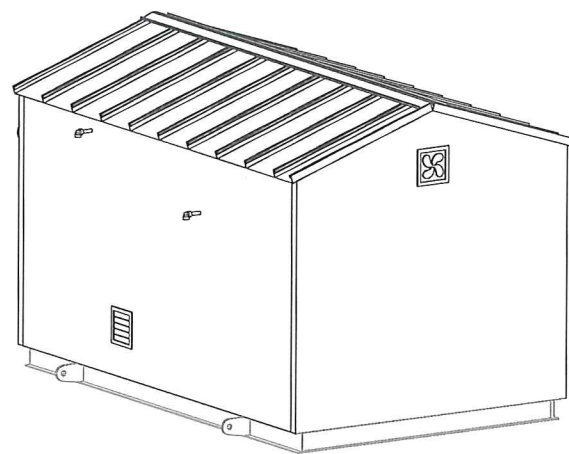
CLIENT: PARAMOUNT RESOURCES c/o GAS LIQUIDS ENGINEERING	
INSTRUMENT AIR PACKAGE	
25HP DUAL INSTRUMENT AIR	
LSD: 06-18-066-04 W6M	
PART#	DWG#
XXXX	16182 DUAL-25HP-INST AIR PID
REV	1



**BUILDING NOTES**  
 SELF FRAMING  
 R12 WALLS, R20 ROOF  
 STONE GREY EXTERIOR, WHITE INTERIOR  
 16'-0" LONG x 10'-0" WIDE  
 8'-0" EAVE HEIGHT, 4:12 PITCH  
 1 - 3'x7' MAN DOOR, c/w PANIC HARDWARE, GPW WINDOW, CHECK CHAIN & RETAINER  
 1 - 40" x 40" SLIDING WINDOW c/w SCREEN  
 2 - 12" x 12" LOUVERS  
 2 - ET12-1 EXHAUST FANS

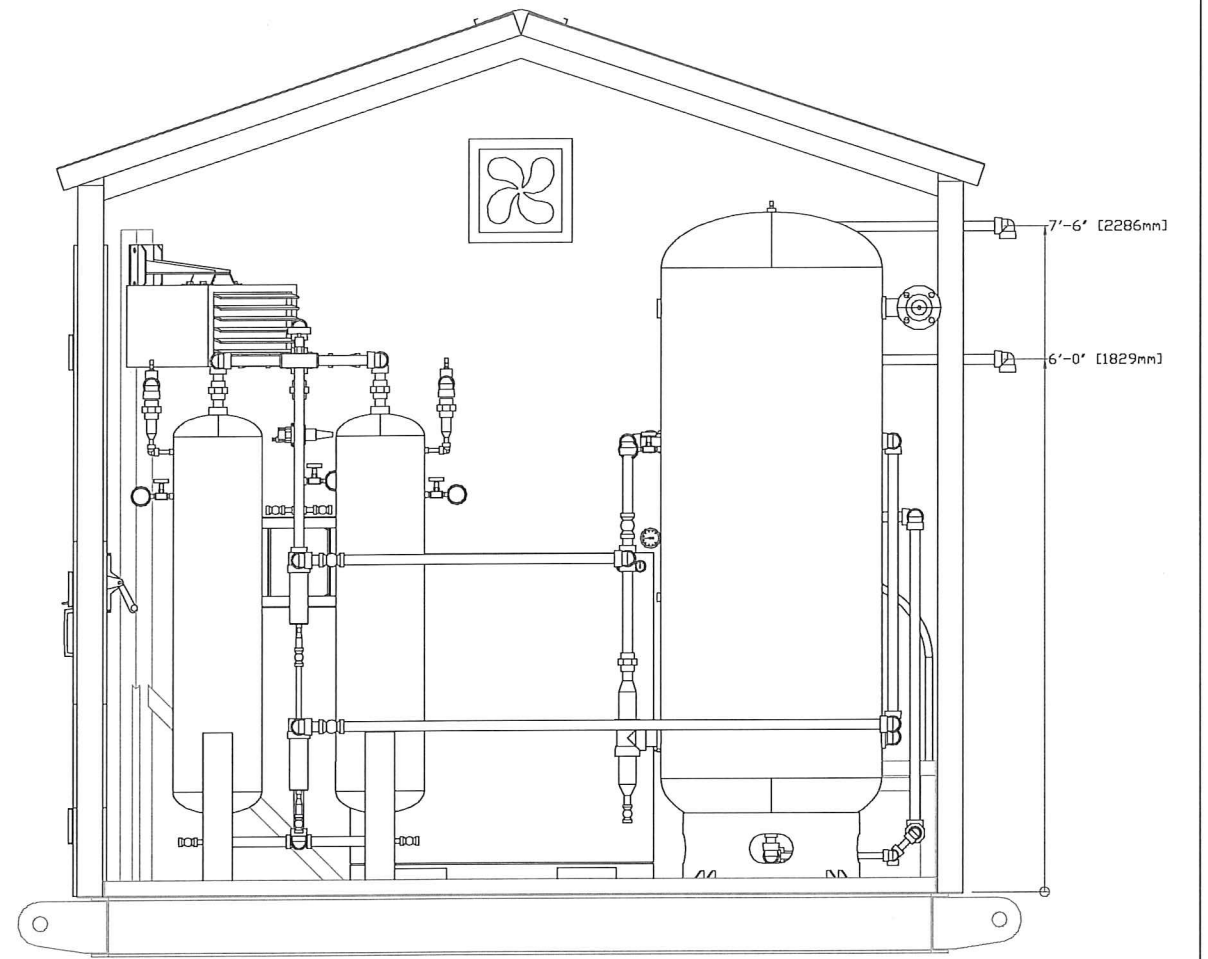
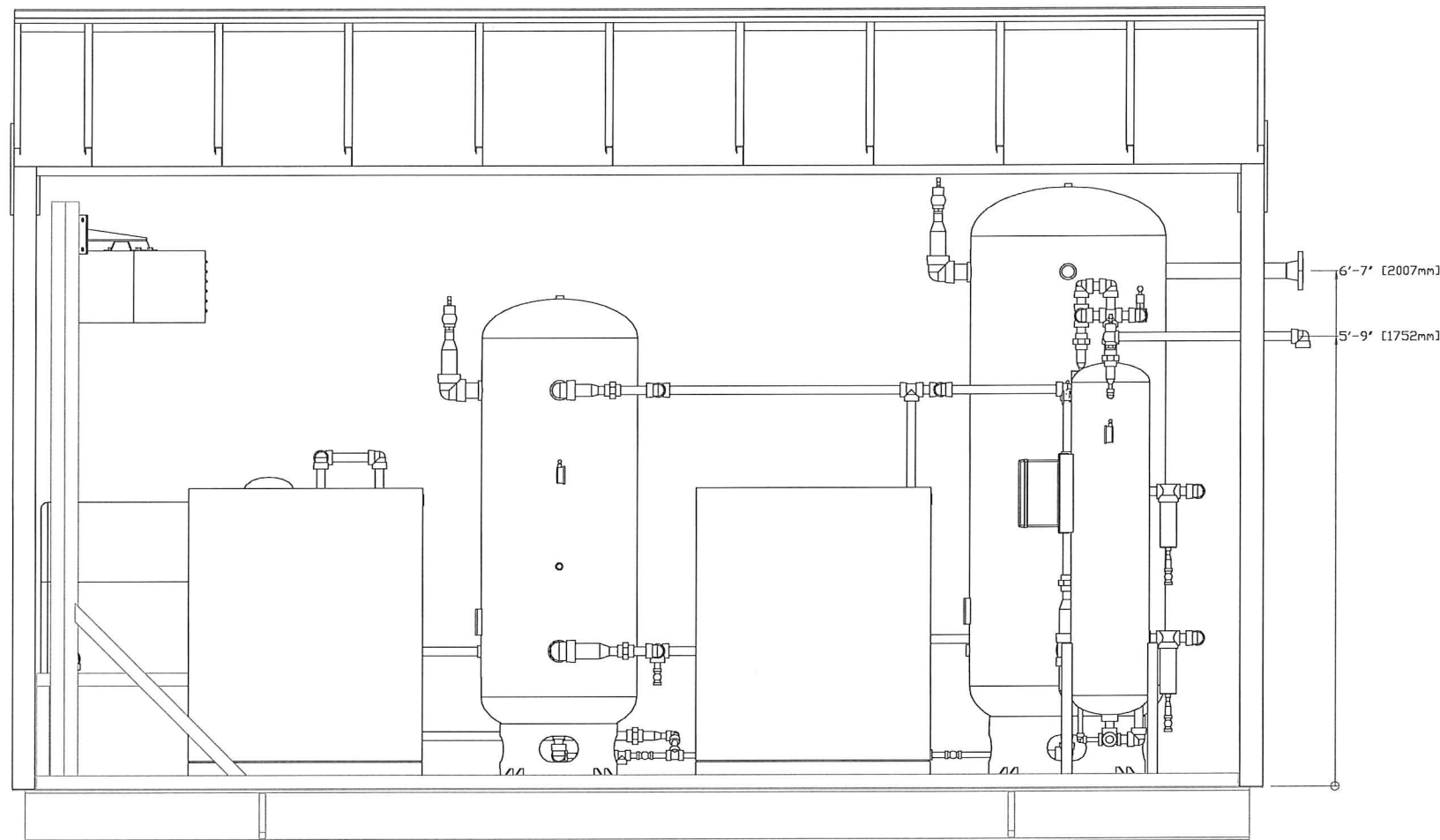


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**SHIPPING INFORMATION**  
 LENGTH: 16'-6"  
 WIDTH: 11'-4"  
 HEIGHT: 10'-7 3/4"  
 APPROXIMATE PACKAGE WEIGHT: 14,000 LBS

				<b>ENVISION</b> MANUFACTURING & SUPPLY			CLIENT: PARAMOUNT RESOURCES c/o GAS LIQUIDS ENGINEERING		
							<b>INSTRUMENT AIR PACKAGE</b>		
							25HP DUAL INSTRUMENT AIR		
1	09/12/2016	ADD LINE #'S. REVISED TAG #'S AS PER CUSTOMER NOTES	DF	NM	TB	PART#	DWG#	REV	
0	29/11/2016	ISSUED FOR CONSTRUCTION	DF	NM	TB	XXXX	16182 DUAL-25HP-INST AIR GA BUILDING	1	
REV	DD/MM/YYYY	REVISION	BY	CHK	APP				

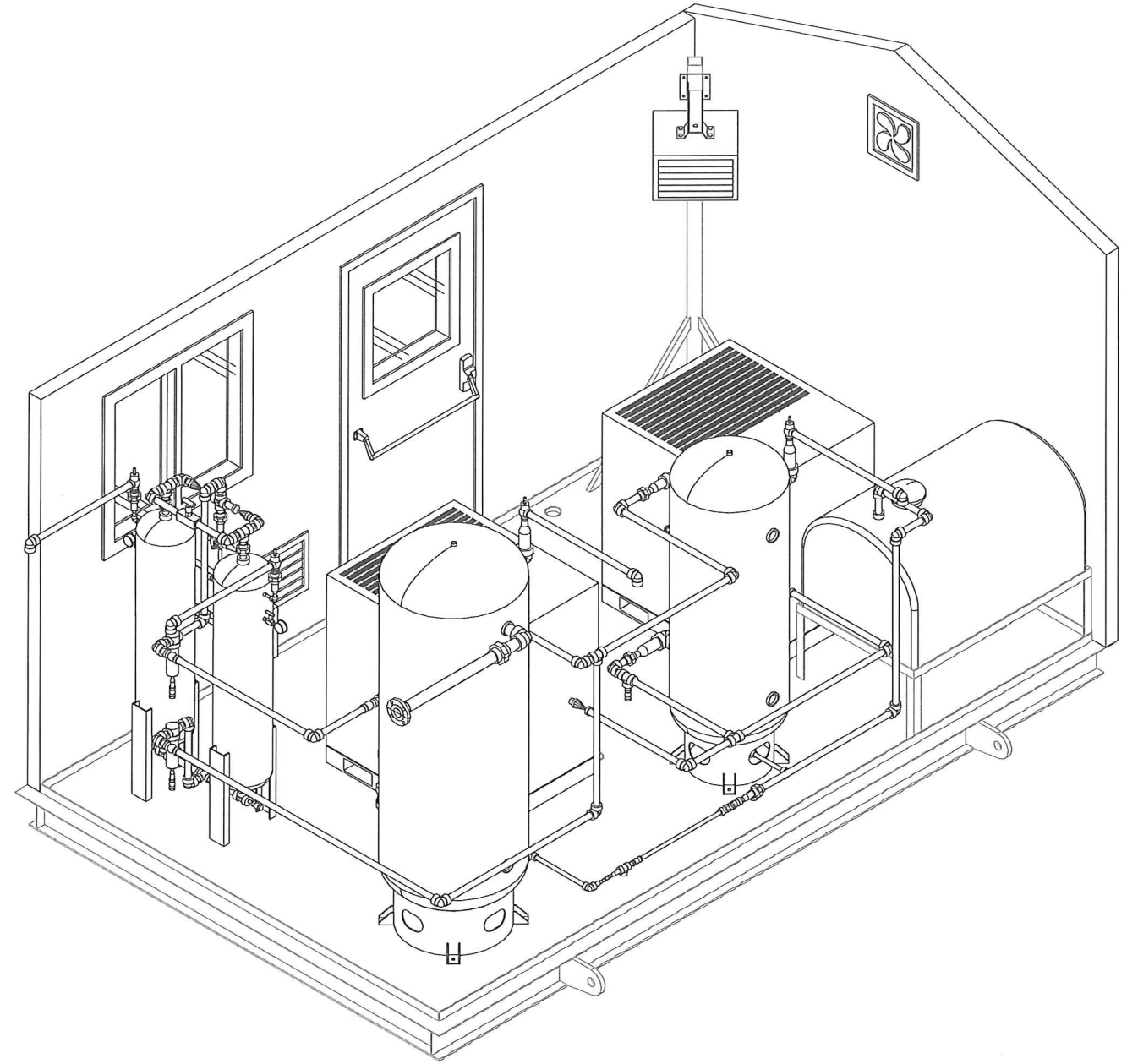
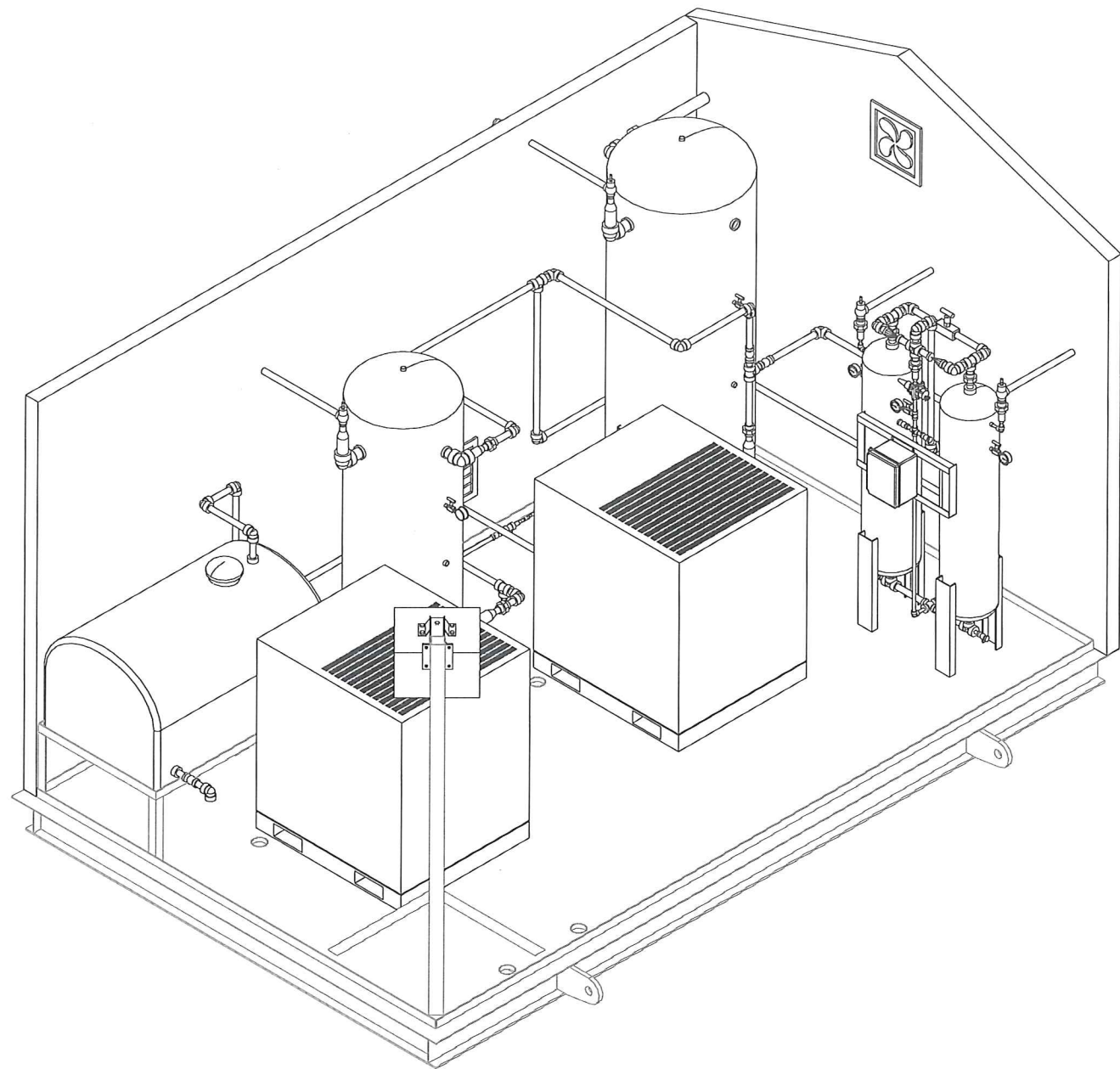


Job # 16182  
 Issued For  
 DEC 10 2016  
 Construction  
 JWC

REV	DD/MM/YYYY	REVISION	BY	CHK	APP
1	09/12/2016	ADD LINE #'S. REVISED TAG #'S AS PER CUSTOMER NOTES	DF	NM	TB
0	29/11/2016	ISSUED FOR CONSTRUCTION	DF	NM	TB



CLIENT: PARAMOUNT RESOURCES c/o GAS LIQUIDS ENGINEERING	
<b>INSTRUMENT AIR PACKAGE</b> 25HP DUAL INSTRUMENT AIR	
PART#	REV
XXXX	1
DWG#	
16182 DUAL-25HP-INST AIR GA ELEV	



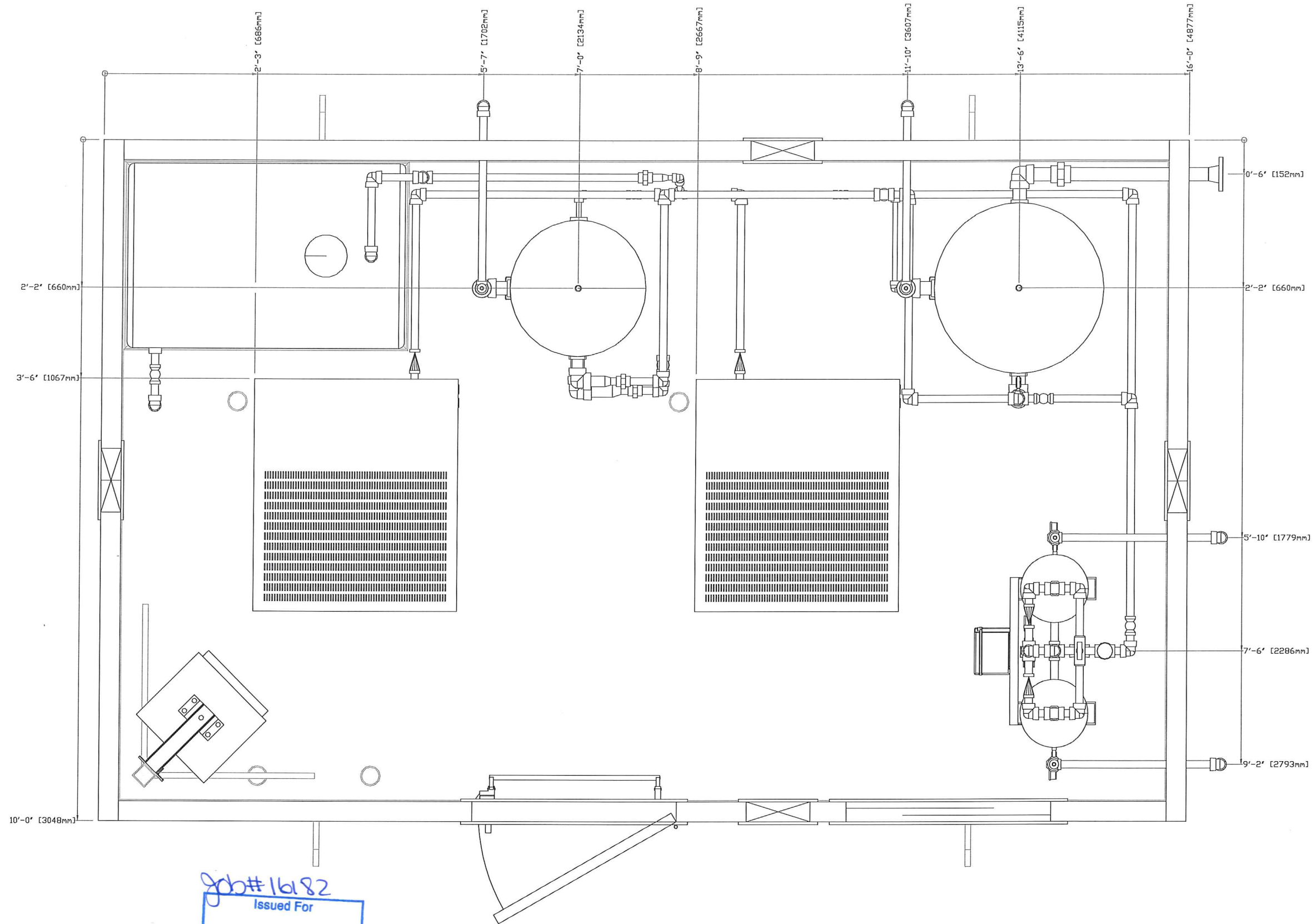
Job# 16182  
 Issued For  
 DEC 10 2016  
 Construction  
 [Signature]

REV	DD/MM/YYYY	REVISION	BY	CHK	APP
1	09/12/2016	ADD LINE #'S. REVISED TAG #'S AS PER CUSTOMER NOTES	DF	NM	TB
0	29/11/2016	ISSUED FOR CONSTRUCTION	DF	NM	TB



CLIENT: PARAMOUNT RESOURCES c/o GAS LIQUIDS ENGINEERING	
INSTRUMENT AIR PACKAGE 25HP DUAL INSTRUMENT AIR	
PART#	DWG#
XXXX	16182 DUAL-25HP-INST AIR GA LAYOUT
REV	1



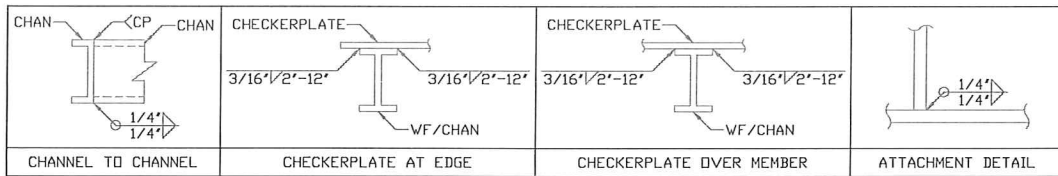


Job# 16182  
 Issued For  
 DEC 10 2016  
 Construction  
 Jico

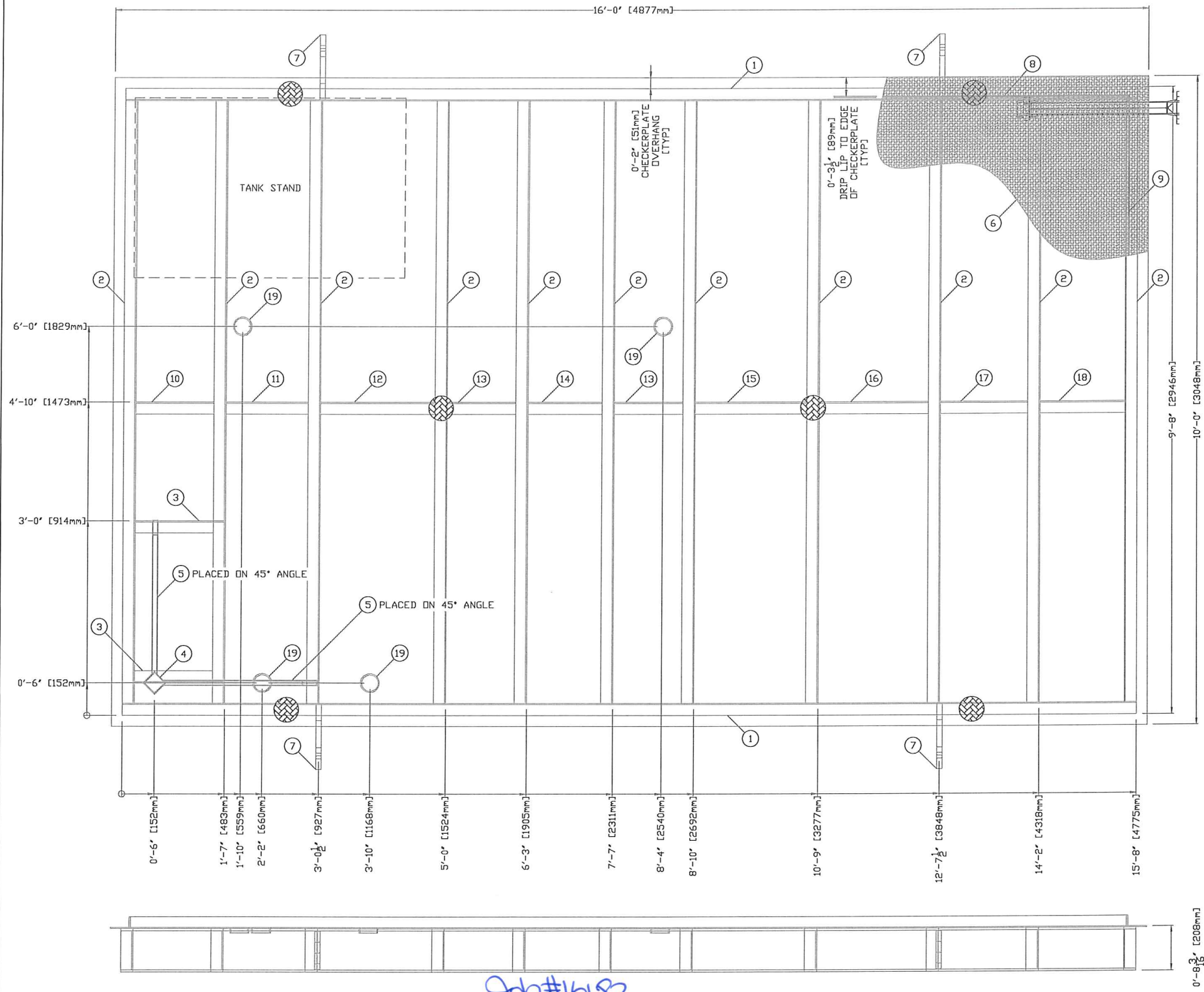
REV	DD/MM/YYYY	REVISION	BY	CHK	APP
1	09/12/2016	ADD LINE #'S. REVISED TAG #'S AS PER CUSTOMER NOTES	DF	NM	TB
0	29/11/2016	ISSUED FOR CONSTRUCTION	DF	NM	TB



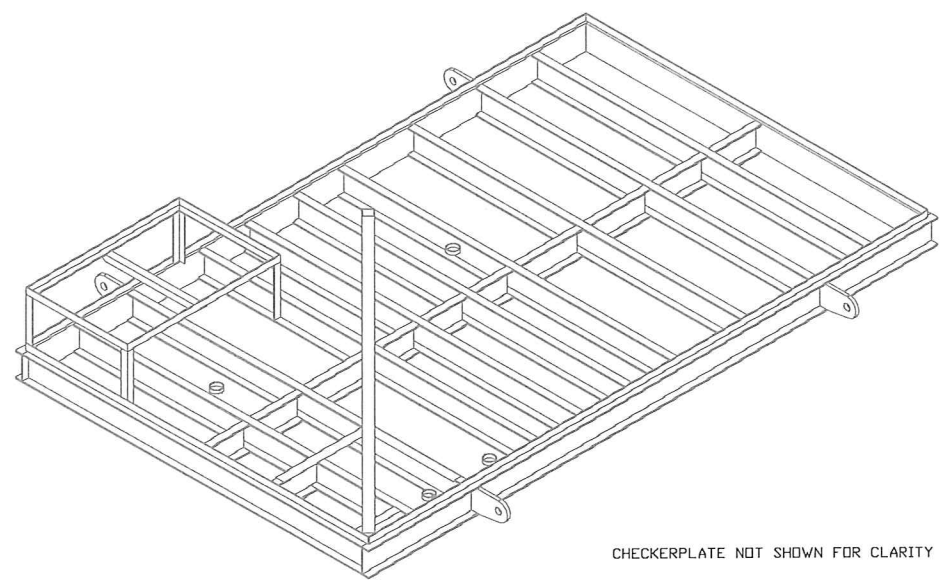
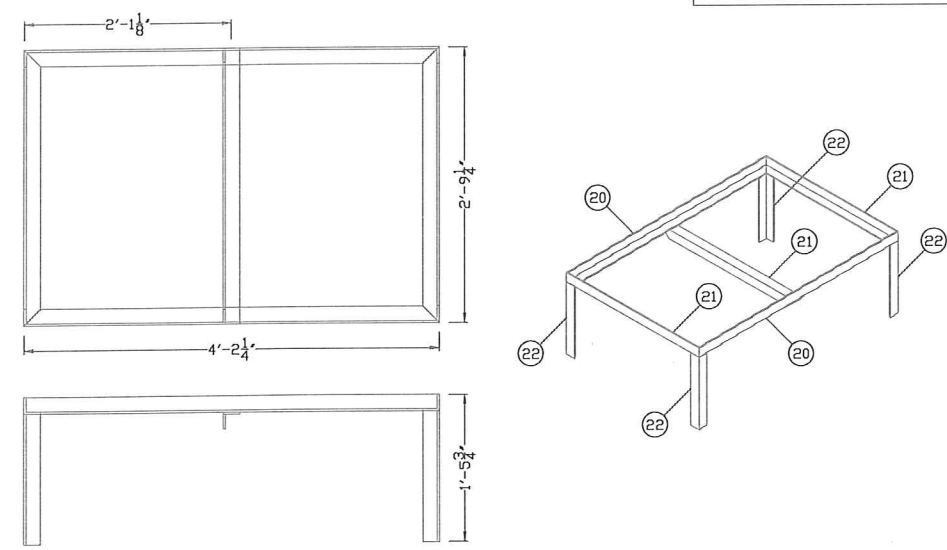
CLIENT: PARAMOUNT RESOURCES c/o GAS LIQUIDS ENGINEERING		
INSTRUMENT AIR PACKAGE 25HP DUAL INSTRUMENT AIR		
PART#	DWG#	REV
XXXX	16182 DUAL-25HP-INST AIR GA PLAN	1



BILL OF MATERIALS					
ITEM	QTY	PN	DESCRIPTION	LENGTH	MATERIAL
1	2	1074	CHANNEL - C8 x 11.5#	15'-8"	SA36-44W
2	11	1074	CHANNEL - C8 x 11.5#	9'-3 1/2"	SA36-44W
3	2	1074	CHANNEL - C8 x 11.5#	1'-4 1/2"	SA36-44W
4	1	1454	HSS - 3' x 3' x 1/4"WALL	7'-6"	SA36-44W
5	2	1452	HSS - 2' x 1' x 1/8"WALL	3'-3 5/8"	SA36-44W
6	1	1664	CHECKERPLATE - 10'-0" x 16'-0" x 3/16"THK	-	SA36-44W
7	4	1475	LUGS - 7' x 12' x 1"THK	-	SA36-44W
8	2	1325	FLATBAR - 2' x 1/4"	15'-4 1/2"	SA36-44W
9	2	1325	FLATBAR - 2' x 1/4"	9'-4 1/2"	SA36-44W
10	1	1074	CHANNEL - C8 x 11.5#	1'-2 1/2"	SA36-44W
11	1	1074	CHANNEL - C8 x 11.5#	1'-3 1/4"	SA36-44W
12	1	1074	CHANNEL - C8 x 11.5#	1'-9 1/4"	SA36-44W
13	2	1074	CHANNEL - C8 x 11.5#	1'-0 3/4"	SA36-44W
14	1	1074	CHANNEL - C8 x 11.5#	1'-1 3/4"	SA36-44W
15	1	1074	CHANNEL - C8 x 11.5#	1'-8 3/4"	SA36-44W
16	1	1074	CHANNEL - C8 x 11.5#	1'-8 1/4"	SA36-44W
17	1	1074	CHANNEL - C8 x 11.5#	1'-4 1/4"	SA36-44W
18	1	1074	CHANNEL - C8 x 11.5#	1'-3 3/4"	SA36-44W
19	4	-	PIPE - 3" SCH.STD	0'-1"	SA-106B
20	2	-	ANGLE - 2' x 2' x 1/4"	4'-2 1/2"	SA36-44W
21	3	-	ANGLE - 2' x 2' x 1/4"	2'-9 1/4"	SA36-44W
22	4	-	ANGLE - 2' x 2' x 1/4"	1'-3 3/4"	SA36-44W



APPROXIMATE SKID WEIGHT: 3,000 LBS



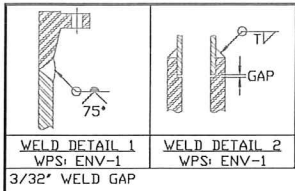
SKID NOTES  
2" URETHANE INSULATION ON UNDERSIDE OF SKID  
⊗ = SUGGESTED PILE LOCATIONS

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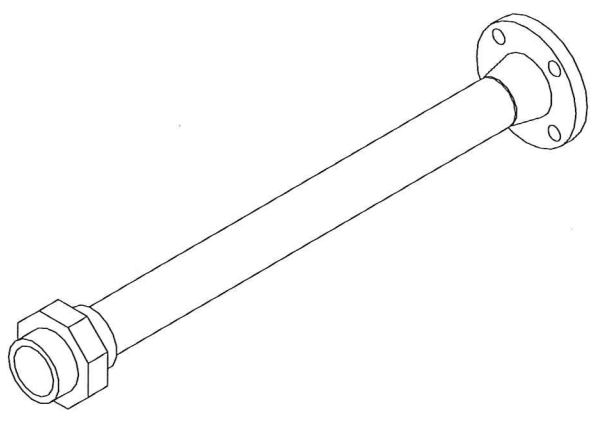
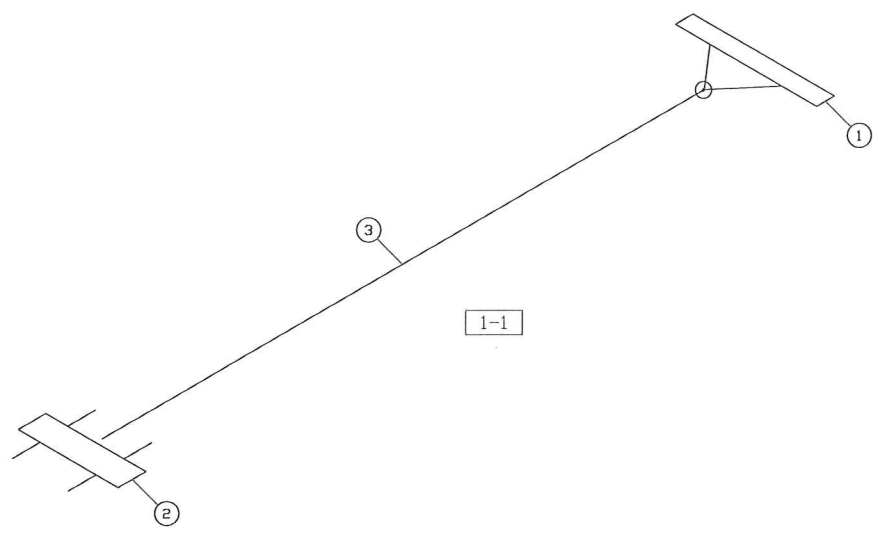
REV	DD/MM/YYYY	REVISION	BY	CHK	APP
1	09/12/2016	ADD LINE #'S. REVISED TAG #'S AS PER CUSTOMER NOTES	DF	NM	TB
0	29/11/2016	ISSUED FOR CONSTRUCTION	DF	NM	TB



CLIENT: PARAMOUNT RESOURCES c/o GAS LIQUIDS ENGINEERING  
INSTRUMENT AIR PACKAGE  
25HP DUAL INSTRUMENT AIR  
PART# DWG#  
XXXX 16182 DUAL-25HP-INST AIR SKID  
REV 1



BILL OF MATERIALS									
ITEM	QTY	PN	SIZE	DESCRIPTION	MATERIAL	LENGTH		HEAT #	
1	1	-	2"	FLANGE - CL150 RFWN x SCH.40	SA-350-LF2	-	-		
2	1	-	2"	UNION - CL3000 THRD x SV	SA-105-N	-	-		
3	1	-	2"	PIPE - SMLS x SCH.40	SA-333-GR6	2'-1 5/16'	642mm		



Job # 16182  
 Issued For  
**DEC 10 2016**  
 Construction  
*[Signature]*

DESIGN DATA	
DESIGN PRESSURE:	225 PSI
CORROSION ALLOWANCE:	1/16"
RADIOGRAPHY:	10%
PWHT:	N/A
HYDROTEST:	338 PSI
WPS:	3603.2
AQP:	1584

REV	DD/MM/YYYY	REVISION	BY	CHK	APP
1	09/12/2016	ADD LINE #'S, REVISED TAG #'S AS PER CUSTOMER NOTES	DF	NM	TB
0	29/11/2016	ISSUED FOR CONSTRUCTION	DF	NM	TB



CLIENT: PARAMOUNT RESOURCES c/o GAS LIQUIDS ENGINEERING			
INSTRUMENT AIR PACKAGE 25HP DUAL INSTRUMENT AIR			
PART#	DWG#	REV	
XXXX	16182 DUAL-25HP-INST AIR SPOOL	1	

**K-2231-01/02**  
AIR COMPRESSOR  
PART#  
ROTORCOMP RS25ENC  
110 CM/HR @ 1310 kPa  
MAWP: 1448 kPa  
MADP: 1310 kPa  
c/w 25HP MOTOR 3600RPM

**V-2231-03**  
WET AIR RECEIVER  
PART#  
VERTICAL  
MAWP: 2068 kPa @ 204°C  
MDMT: -20°F @ 2068 kPa  
120 GAL., 24' Ø x 67' LG.

**V-2231-07**  
DRY AIR RECEIVER  
PART#  
VERTICAL  
MAWP: 2068 kPa @ 204°C  
MDMT: -29°C @ 1379 kPa  
240 GAL., 30' Ø x 84' LG.

**D-2231-04**  
HEATLESS AIR DRYER  
PART#  
119 CM/HR @ 1310 kPa  
120V/1PH/60Hz  
MAWP: 2068 kPa  
S/N: TBA

**F-2231-05**  
PRE-FILTER  
COALESCER HN4S-10CN  
172 CM/HR @ 1310 kPa  
MAWP: 3447 kPa  
0.01 MICRON FILTER  
c/w INTEGRAL FLOAT DRAIN

**F-2231-06**  
AIR FILTER  
PARTICULATE HN4S-10CN  
287 CM/HR @ 1310 kPa  
MAWP: 3447 kPa  
0.9 MICRON FILTER  
MANUAL DRAIN

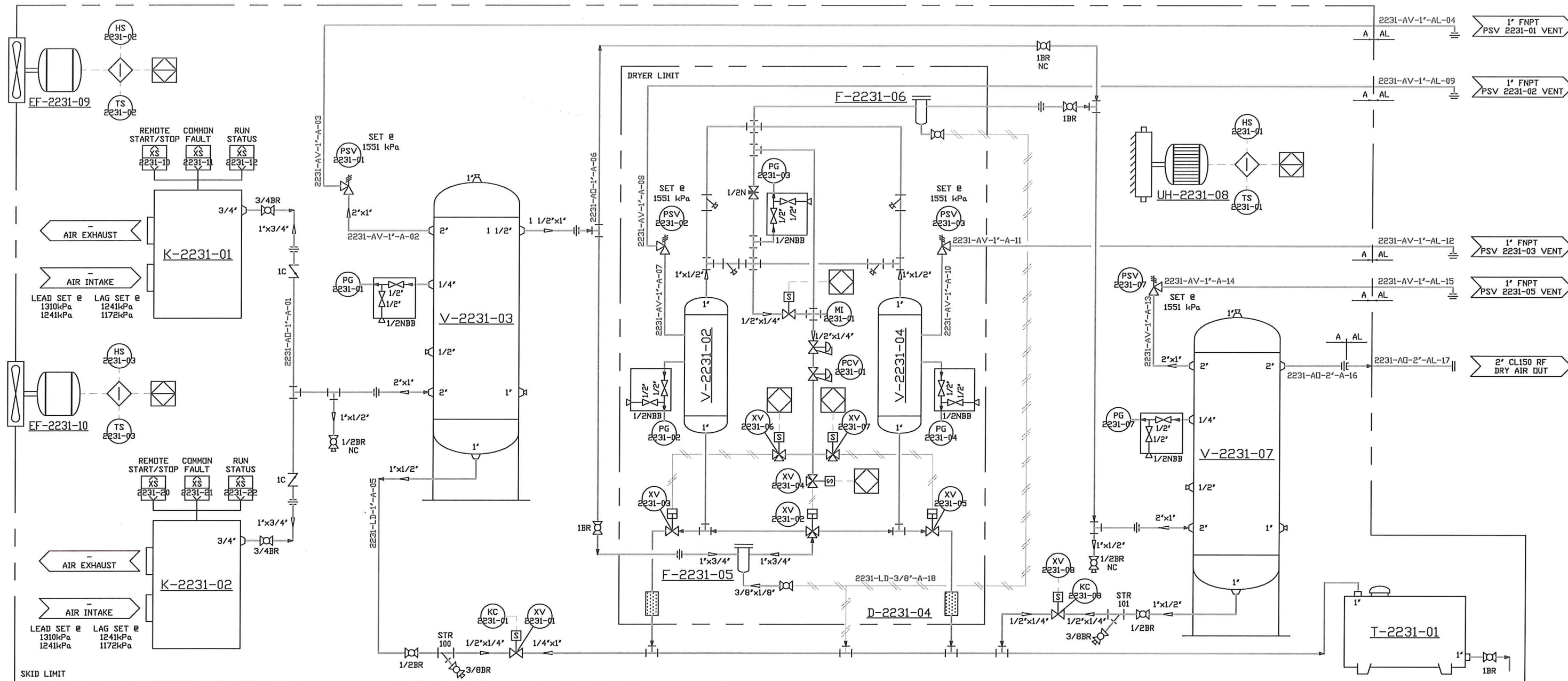
**UH-2231-08**  
BUILDING HEATER  
PART# 2578  
CALORITECH  
MODEL GE107CT480  
10KW  
480 VOLT, 3 PHASE

**EF-2231-09/10**  
EXHAUST FAN  
ET12-1  
120 VOLT, 1 PHASE  
1/4HP  
120V/1/60Hz  
c/w HOOD

**V-2231-02/04**  
AIR DRYER  
NORTHWEST NW75  
CAPACITY: 127 CM/HR @ 689 kPa  
MAWP: 2068 kPa  
MAX INLET TEMP: 49°C

**T-2231-01**  
LOAF TANK  
PLASTIC  
CAPACITY: 379 LITRES  
406mm VENTED LID  
826mm WIDE x 711mm HIGH x 1245mm LONG

BILL OF MATERIALS			
TAG	QTY	PN	DESCRIPTION
PSV-2231-01/2/3/7	4	2572	PRESSURE SAFETY VALVE, MERCER, 1" x 1"NPT C DRIFICE, SET @ 1551kPa
PG-2231-01/2/3/4/7	5	1405	PRESSURE GAUGE, WIKA, 0-300PSI, 4" DIAL x 1/2"NPT, LOWER MOUNT
STR-100/101	2	2284	Y-STRAINER, ALTA STRAINERS, 1/2"FNPT, 2000CL
XV-2231-01/8	2	-	SOLENOID VALVE, ASCO, SC0262H086, 1/4"NPT, 2-WAY VALVE
KC-2231-01/8	2	-	ELECTRIC TIMER, ASCO, 2-40 SECOND TIMER DN, 30 SECOND TO 45 MINUTE OFF
XV-2231-04/6/7	3	-	EXHAUST SOLENOID VALVE, AIRTEK
XV-2231-02	1	-	INLET PILOT SOLENOID VALVE, AIRTEK 3-WAY, c/w DRYER
XV-2231-03/5	2	-	EXHAUST PILOT VALVE, c/w DRYER ASSEMBLY
PCV-2231-01	1	-	PURGE REG, PNEUMATIC, 1/4"NPT, 2068kPa MAX, 65°C, SP RG 34-1034kPa
1BR	4	2291	1" NPT BALL VALVE, KF, REG PORT, 2000CL
3/4BR	2	-	3/4" NPT BALL VALVE
1/2BR	6	2290	1/2" NPT BALL VALVE, KF, REG PORT, 2000CL
3/8BR	2	2289	3/8" NPT BALL VALVE, KF, REG PORT, 2000CL
1C	4	2071	1" NPT CHECK VALVE, 2160CL
1N	1	2573	1" NPT NEEDLE VALVE
1/2NBB	5	-	1/2" BLOCK AND BLEED NEEDLE VALVE, CENTURY, CM26R-1M44TCNT



**PIPING NOTES**  
 THREADED PIPE: 2" AND UNDER TO BE SA-106-GRB SCH.80  
 THRD FITTINGS: CL3000 SA-105N  
 TUBING: 3/8" 316 SS WELDED 0.035 WALL  
 1/2" 316 SS WELDED 0.049 WALL  
 TUBING FITTINGS: SWAGelok SS

**GENERAL NOTES**  
 BUILDING: 10' 0" WIDE, 16' 0" LONG, SELF FRAMING  
 EAVE HEIGHTS: 8' 0" EAVE HEIGHT, 4:12 PITCH  
 BUILDING COLOUR: STONE GREY EXTERIOR, WHITE INTERIOR  
 PIPING COLOUR: GREY  
 SKID: 10' 0" WIDE, 16' 0" LONG  
 ELECTRICAL: ALL BY OTHERS



*Ram Jayaraman*  
 01/17/17

REV	DD/MM/YYYY	REVISION	DF	NM	TB
2	13/01/2017	AS BUILT	DF	NM	TB
1	09/12/2016	ADD LINE #'S. REVISED TAG #'S AS PER CUSTOMER NOTES	DF	NM	TB
0	29/11/2016	ISSUED FOR CONSTRUCTION	DF	NM	TB



CLIENT: PARAMOUNT RESOURCES c/o GAS LIQUIDS ENGINEERING  
 INSTRUMENT AIR PACKAGE  
 25HP DUAL INSTRUMENT AIR  
 LSD: 06-18-066-04 W6M  
 PART# DWG#  
 XXXX 16182 DUAL-25HP-INST AIR PID  
 REV 2

**K-2231-01/02**  
**AIR COMPRESSOR**  
 PART# ROTORCOMP RS25ENC  
 110 CM/HR @ 1310 kPa  
 MAVP: 1448 kPa  
 MADP: 1310 kPa  
 c/w 25HP MOTOR 3600RPM

**V-2231-03**  
**WET AIR RECEIVER**  
 PART# VERTICAL  
 MAVP: 2068 kPa @ 204°C  
 MDMT: -20°F @ 2068 kPa  
 120 GAL., 24" Ø x 67" LG.

**V-2231-07**  
**DRY AIR RECEIVER**  
 PART# VERTICAL  
 MAVP: 2068 kPa @ 204°C  
 MDMT: -29°C @ 1379 kPa  
 240 GAL., 30" Ø x 84" LG.

**D-2231-04**  
**HEATLESS AIR DRYER**  
 PART#  
 119 CM/HR @ 1310 kPa  
 120V/1PH/60Hz  
 MAVP: 2068 kPa  
 S/N TBA

**F-2231-05**  
**PRE-FILTER**  
 COALESCER JC0085-C  
 172 CM/HR @ 1310 kPa  
 MAVP: 3447 kPa  
 0.01 MICRON FILTER  
 c/w INTEGRAL FLOAT DRAIN

**F-2231-06**  
**AIR FILTER**  
 PARTICULATE JC0085-F  
 287 CM/HR @ 1310 kPa  
 MAVP: 3447 kPa  
 0.9 MICRON FILTER  
 MANUAL DRAIN

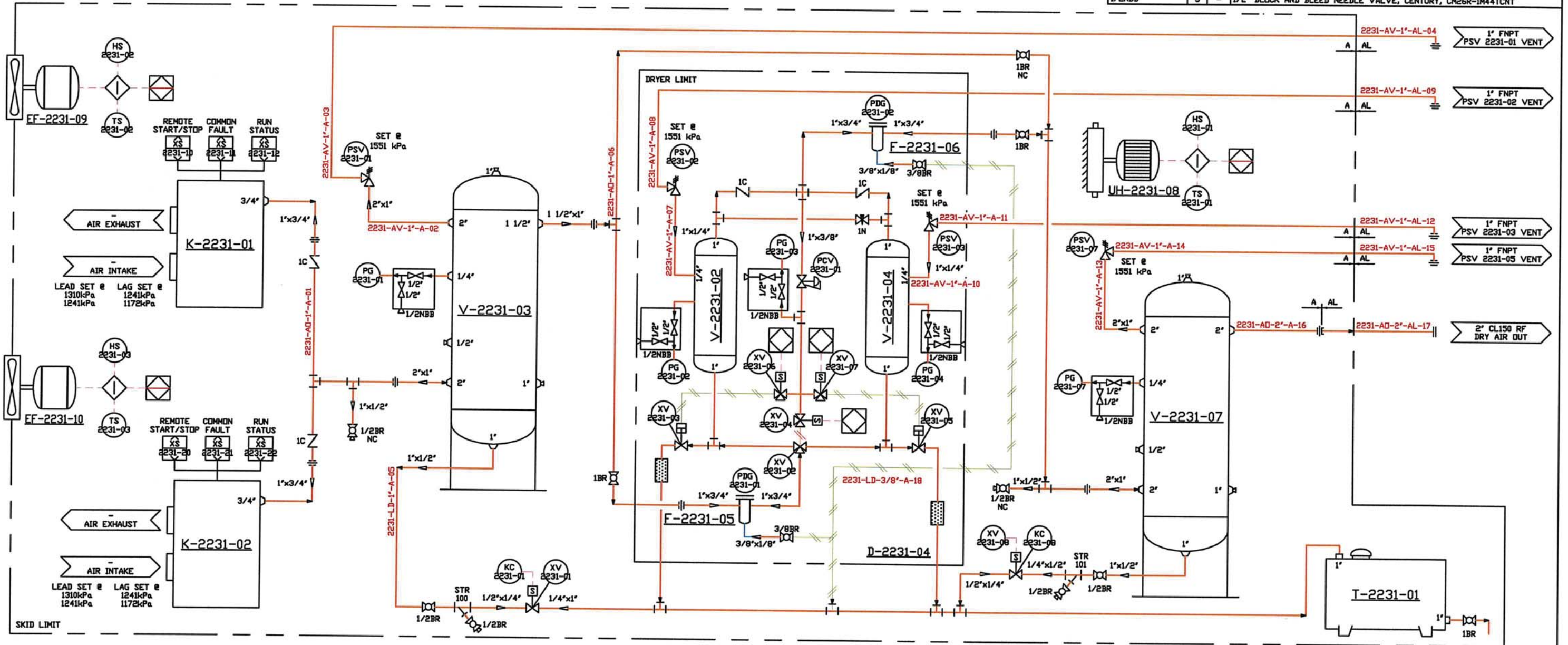
**UH-2231-08**  
**BUILDING HEATER**  
 PART# 2578  
 CALORITECH  
 MODEL GE107CT480  
 10KW  
 480 VOLT, 3 PHASE

**EF-2231-09/10**  
**EXHAUST FAN**  
 ET12-1  
 120 VOLT, 1 PHASE  
 1/4HP  
 120V/1/60Hz  
 c/w HOOD

**V-2231-02/04**  
**AIR DRYER**  
 NORTHWEST NW75  
 CAPACITY: 127 CM/HR @ 689 kPa  
 MAVP: 2068 kPa  
 MAX INLET TEMP: 49°C

**T-2231-01**  
**LOAF TANK**  
 PLASTIC  
 CAPACITY: 379 LITRES  
 406mm VENTED LID  
 826mm WIDE x 711mm HIGH x 1245mm LONG

BILL OF MATERIALS			
TAG	QTY	PN	DESCRIPTION
PSV-2231-01/2/3/7	4	2572	PRESSURE SAFETY VALVE, MERCER, 1" x 1"NPT C DRIFICE, SET @ 1551kPa
PG-2231-01/2/3/4/7	5	1405	PRESSURE GAUGE, VIKO, 0-300PSI, 4" DIAL x 1/2"NPT, LOWER MOUNT
STR-100/101	2	2284	Y-STRAINER, ALTA STRAINERS, 1/2"FNPT, 2000CL
XV-2231-01/8	2	-	SOLENOID VALVE, ASCO, B262H202, 1/4"NPT, 2-WAY VALVE
KC-2231-01/8	2	-	ELECTRIC TIMER, ASCO, 2-40 SECOND TIMER ON, 30 SECOND TO 45 MINUTE OFF
PDG-2231-01/2	2	-	DIFFERENTIAL PRESSURE INDICATOR, c/w F-101, F-202
XV-2231-04/6/7	3	-	EXHAUST SOLENOID VALVE, AIRTEK
XV-2231-02	1	-	INLET PILOT SOLENOID VALVE, AIRTEK 3-WAY, c/w DRYER
XV-2231-03/5	2	-	EXHAUST PILOT VALVE, c/w DRYER ASSEMBLY
PCV-2231-01	1	-	PURGE REGULATOR, PNEUMATIC, 1/2"NPT, 1724kPa MAX, 79°C, SET @ 207kPa
1BR	4	2291	1" NPT BALL VALVE, KF, REG PORT, 2000CL
1/2BR	6	2290	1/2" NPT BALL VALVE, KF, REG PORT, 2000CL
3/8BR	2	2289	3/8" NPT BALL VALVE, KF, REG PORT, 2000CL
1C	4	2071	1" NPT CHECK VALVE, 2160CL
1N	1	2573	1" NPT NEEDLE VALVE
1/2NBB	5	-	1/2" BLOCK AND BLEED NEEDLE VALVE, CENTURY, CM26R-1M44TCNT



**PIPING NOTES**

THREADED PIPE:	2" AND UNDER TO BE SA-106-GRB SCH80
THRD FITTINGS:	CL3000 SA-105N
TUBING:	3/8" 316 SS WELDED 0.035 WALL
TUBING FITTINGS:	1/2" 316 SS WELDED 0.049 WALL
	SWAGelok SS

**GENERAL NOTES**

BUILDING:	10' 0" WIDE, 16' 0" LONG, SELF FRAMING
EAVE HEIGHTS:	8' 0" EAVE HEIGHT, 4:12 PITCH
BUILDING COLOUR:	STONE GREY EXTERIOR, WHITE INTERIOR
PIPING COLOUR:	GREY
SKID:	10' 0" WIDE, 16' 0" LONG
ELECTRICAL:	ALL BY OTHERS



Piping Designed to meet ASME B31.3 (2014).

Dec 12, 2016

REV	DD/MM/YYYY	REVISION	BY	CHK	APP
1	09/12/2016	ADD LINE #S. REVISED TAG #S AS PER CUSTOMER NOTES	DF	NM	TB
0	29/11/2016	ISSUED FOR CONSTRUCTION	DF	NM	TB



CLIENT: PARAMOUNT RESOURCES c/o GAS LIQUIDS ENGINEERING	
INSTRUMENT AIR PACKAGE	
25HP DUAL INSTRUMENT AIR	
LSD: 06-18-066-04 WGM	
PART#	DWG#
XXXX	16182 DUAL-25HP-INST AIR PID
REV	1

**LINE LIST**

LINE NUMBER	PIPE SPEC.	SERVICE	SIZE	SCH.	CLASS	MATERIAL / GRADE	C.A.	NOTES	DESIGN		TEST PRESS. PSI	PWHT	X-RAY	OTHER NDE	TEST MEDIUM	ORIGIN	TERMINATION
									PRESS. PSI	MAX. / MIN. TEMP. °F							
2231-AO-1"-A-01	A	AIR	1/2", 3/4", 1", 2"	SCH80	150CL	SA-106 GR B	1/16"	2	225	-20/315	337	N/A	N/A	VT	WATER	K-2231-01/K-2231-02	V-2231-03
2231-AV-1"-A-02	A	AIR	1", 2"	SCH80	150CL	SA-106 GR B	1/16"	2	225	-20/315	337	N/A	N/A	VT	WATER	V-2231-03	PSV-2231-01
2231-AV-1"-A-03	A	AIR	1"	SCH80	150CL	SA-106 GR B	1/16"	2	14.9	-20/650	N/A	N/A	N/A	VT	N/A	PSV-2231-01	2231-AV-1"-AL-04
2231-AV-1"-AL-04	AL	AIR	1"	SCH80	150CL	SA-333 GR 6	1/16"	2	14.9	-50/650	N/A	N/A	N/A	VT	N/A	2231-AV-1"-A-03	OFF-SKID
2231-LD-1"-A-05	A	AIR	1/2", 1"	SCH80	150CL	SA-106 GR B	1/16"	2	225	-20/315	337	N/A	N/A	VT	WATER	V-2231-03 / V-2231-07 / V-2231-02 / V2231-04	T-2231-01
2231-AO-1"-A-06	A	AIR	1", 1-1/2", 2"	SCH80	150CL	SA-106 GR B	1/16"	2	225	-20/315	337	N/A	N/A	VT	WATER	V-2231-03	V-2231-07 / V-2231-02 / V-2231-04 / 2231-LD-1"-A-05
2231-AV-1"-A-07	A	AIR	1/4", 1"	SCH80	150CL	SA-106 GR B	1/16"	2	225	-20/315	337	N/A	N/A	VT	WATER	V-2231-02	PSV-2231-02
2231-AV-1"-A-08	A	AIR	1"	SCH80	150CL	SA-106 GR B	1/16"	2	14.9	-20/650	N/A	N/A	N/A	VT	N/A	PSV-2231-02	2231-AV-1"-AL-09
2231-AV-1"-AL-09	AL	AIR	1"	SCH80	150CL	SA-333 GR 6	1/16"	2	14.9	-50/650	N/A	N/A	N/A	VT	N/A	2231-AV-1"-A-08	OFF-SKID
2231-AV-1"-A-10	A	AIR	1/4", 1"	SCH80	150CL	SA-106 GR B	1/16"	2	225	-20/315	337	N/A	N/A	VT	WATER	V-2231-04	PSV-2231-03
2231-AV-1"-A-11	A	AIR	1"	SCH80	150CL	SA-106 GR B	1/16"	2	14.9	-20/650	N/A	N/A	N/A	VT	N/A	PSV-2231-03	2231-AV-1"-AL-12
2231-AV-1"-AL-12	AL	AIR	1"	SCH80	150CL	SA-333 GR 6	1/16"	2	14.9	-50/650	N/A	N/A	N/A	VT	N/A	2231-AV-1"-A-11	OFF-SKID
2231-AV-1"-A-13	A	AIR	1", 2"	SCH80	150CL	SA-106 GR B	1/16"	2	225	-20/315	337	N/A	N/A	VT	WATER	V-2231-07	PSV-2231-07
2231-AV-1"-A-14	A	AIR	1"	SCH80	150CL	SA-106 GR B	1/16"	2	14.9	-20/650	N/A	N/A	N/A	VT	N/A	PSV-2231-07	2231-AV-1"-AL-15
2231-AV-1"-AL-15	AL	AIR	1"	SCH80	150CL	SA-333 GR 6	1/16"	2	14.9	-50/650	N/A	N/A	N/A	VT	N/A	2231-AV-1"-A-14	OFF-SKID
2231-AO-2"-A-16	A	AIR	2"	SCH80	150CL	SA-106 GR B	1/16"	2, 4	225	-20/315	337	N/A	N/A	VT	WATER	V-2231-07	2231-AO-2"-AL-17
2231-AO-2"-AL-17	AL	AIR	2"	SCH40	150CL	SA-333 GR 6	1/16"	1	225	-50/315	337	N/A	10%	VT	WATER	2231-AO-2"-A-16	OFF-SKID
2231-LD-3/8"-A-18	A	AIR	3/8"	0.035"	N/A	316 SS WELDED	N/A	3	225	-20/315	337	N/A	N/A	VT	WATER	PDG-2231-01 / PDG-2231-02	2231-LD-1"-A-05

**PSV DATA:**

DESIGNATION	MAKE	MODEL	SIZE	SPECIFICATION	SET @ PSI
PSV-2231-01	MERCER	91-17C52V06C1	1" MNPT X 1" FNPT	ORIFICE - 0.062 SQ. IN.	225
PSV-2231-02	MERCER	91-17C52V06C1	1" MNPT X 1" FNPT	ORIFICE - 0.062 SQ. IN.	225
PSV-2231-03	MERCER	91-17C52V06C1	1" MNPT X 1" FNPT	ORIFICE - 0.062 SQ. IN.	225
PSV-2231-07	MERCER	91-17C52V06C1	1" MNPT X 1" FNPT	ORIFICE - 0.062 SQ. IN.	225

**GENERAL NOTES:**

- CODE: ASME B31.3-2014
- FITTINGS: A-105N, A-234WPB,
- FLANGES: A-350-LF2 RFWN
- GASKETS: RF SPIRAL WOUND 316SS, 1/8" THK.
- BOLTS & NUTS: B7M A-193/2HM A-194
- TUBE FITTINGS: 316 SS
- 1. WELDED LINE
- 2. THREADED LINE
- 3. TUBING 4. SEE ATTACHED SPEC DEVIATION

CUSTOMER: Paramount Resources c/o GLE  
 JOB #: 16182  
 DRAWING #: 16182 DUAL-25HP-INST AIR PID REV 1  
 DATE: December 9, 2016

DOCUMENT #: 16182 LINE LIST (16104-1501-01 PKG2231)  
 REVISION #: 0  
 CREATED BY: Tasha McDonald



*Piping designed to meet ASME B31.3 (2014)*

Dec 12, 2016

**BUILDINGS SPECIFICATIONS AND GENERAL NOTES**

**ROOF TYPE & SLOPE**

GABLE 4:12  
 SHED 3:12  
 N/A  
 OTHER \_\_\_\_\_

**VAPOUR BARRIER**

N/A  
 4 MIL  
 6 MIL  
 TUCK TAPE  
 OTHER \_\_\_\_\_

NOTES: \_\_\_\_\_

**BUILDING VENTILATION**

**LOUVERS**  
 N/A  
 2 12' X 12' MANUALLY ADJ.  
 18' X 18' MANUALLY ADJ.  
 24' X 24' MANUALLY ADJ.  
 OTHER \_\_\_\_\_

**FANS**  
 N/A  
 2 12' X 12' EXHAUST FAN  
 24' X 24' EXHAUST FAN  
 OTHER \_\_\_\_\_

ALL FANS c/w HOOD AND BIRD SCREEN

HVAC  
 HEATERS

NOTES: \_\_\_\_\_

**ROOF VENTILATION**

**RIDGE VENT**  
 N/A  
 Ø THROAT x \_\_\_\_\_ LENGTH  
 Ø THROAT x \_\_\_\_\_ LENGTH  
 CHAIN OPERATED w/MANUAL DAMPER AND BIRD SCREEN  
 WHIRLYBIRD  
 ROOF VENTS  
 OTHER \_\_\_\_\_

**MATERIAL & BUILDING COLOUR**

ASTM-A663 / A792 SS GRADE 37 22 GAUGE STEEL PREPAINTED

WALL STONE GRAY (QC8305) ROOF STONE GRAY (QC8305)  
 TRIM STONE GRAY (QC8305) DOOR STONE GRAY (QC8305)

ASTM A792SS GRADE 37 AZ 50 22 GAUGE GALVALUME

WALL \_\_\_\_\_ ROOF \_\_\_\_\_  
 TRIM \_\_\_\_\_ DOOR \_\_\_\_\_

NOTES: \_\_\_\_\_

**WALL THICKNESS**

INTERLOCKING STRUCTURAL RIB PANELS

3 1/2"  
 4 1/2"  
 5 1/2"  
 Z CHANNEL  
 DRYWALL OR OTHERS

FINAL WALL THICKNESS (INCHES)  3 1/2

NOTES: \_\_\_\_\_

**FOUNDATION**

BY OTHERS  
 BY METALEX  
 SKID SKIRTING 22ga  
 SKID BACKSHEETING 18ga  
 SKID (STEEL)  
 CONCRETE  
 TIMBER  
 UNDER SKID INSULATION

NOTES: \_\_\_\_\_

**DESIGN DATA**

N/A APPROXIMATE BUILDING WEIGHT: 2097 LBS  
 P-ENG DWGS REQUIRED

GROUND SNOW = 2.2 kPa WIND 1/10 = 0.37 kPa  
 RAIN SURCHARGE = 0.1 kPa WIND 1/50 = 0.47 kPa

**INTERIOR LINING**

N/A  
 WHITE  
 PLAIN  
 24 GA FLUTED ALUM  
 26 GA FLUTED STEEL  
 20 GA 10% PERF. ALUM  
 20 GA 35% PERF. ALUM

NOTES: \_\_\_\_\_

**WINDOWS**

N/A  
 1 40' X 40' DBL. GLAZED  
 48' X 36' DBL. GLAZED  
 SLIDING c/w SCREEN AND WINDOW FLASHING w/DRIP

NOTES: \_\_\_\_\_

**OTHERS**

EAVESTROUGH  
 DOWNSPOUT  
 STEEL ICE RAKE  
 1 TIE ROD ANGLE 2" x 2"  
 1 TIE ROD EXT.  
 ROOF TRUSSES  
 PARTITION WALL  
 VESSEL CUT OUT \_\_\_\_\_ DIAM.  
 REMOVABLE WALL PANEL  
 REMOVABLE ROOF PANEL  
 RIB STIFFENERS FOR WALLS  
 RIB STIFFENERS FOR ROOF OR INSULATION RIB 18ga  
 CONTAINMENT FLASHING

NOTES: \_\_\_\_\_

**GENERAL NOTES**

Containment is Welded 3 1/2" in from edge of the skid.

LSD - 06-18-066-04 W6 Meridian.

**INSULATION**

**BUILDING**  
 N/A  
 FIBERGLASS  
 ROXUL RHT 40

**WALLS**  
 R12  
 R20  
 R24  
 R32  
 R36

**ROOF**  
 R12  
 R20  
 R24  
 R32  
 R36

**VESSEL INSULATION**  
 N/A  
 1.5" FIBERGLASS  
 0.020 PLAIN CORRUGATED ALUM  
 OTHER \_\_\_\_\_

NOTES: \_\_\_\_\_

**DOORS**

1 3' X 7' 20 GA STEEL HC  
 3' X 7' 20 GA STEEL PU  
 3' X 7' 18 GA STEEL PS  
 6' X 7' 20 GA STEEL HC  
 6' X 7' 20 GA STEEL PU  
 6' X 7' 18 GA STEEL PS

c/w IWG WINDOW, PANIC HARDWARE, CHECK CHAIN, WEATHER STRIPPING and

CANOPY \_\_\_\_\_ 14 ga FRAME  
 HYDRAULIC CLOSURE  
 EXPANDABLE FRAME  
 SNIFFER PORT  
 KICK PLATE  
 REMOV. TRANSOM PANEL 24" HIGH  
 ROLL UP DOOR  
 OVER HEAD DOOR  
 OTHER \_\_\_\_\_

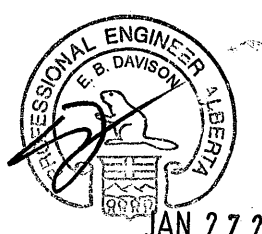
NOTES: \_\_\_\_\_

**OTHERS**


EAVESTROUGH  
 DOWNSPOUT  
 STEEL ICE RAKE  
 1 TIE ROD ANGLE 2" x 2"  
 1 TIE ROD EXT.  
 ROOF TRUSSES  
 PARTITION WALL  
 VESSEL CUT OUT \_\_\_\_\_ DIAM.  
 REMOVABLE WALL PANEL  
 REMOVABLE ROOF PANEL  
 RIB STIFFENERS FOR WALLS  
 RIB STIFFENERS FOR ROOF OR INSULATION RIB 18ga  
 CONTAINMENT FLASHING

NOTES: \_\_\_\_\_

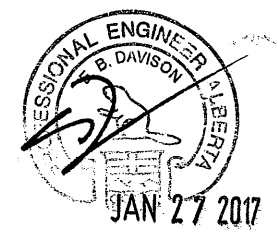
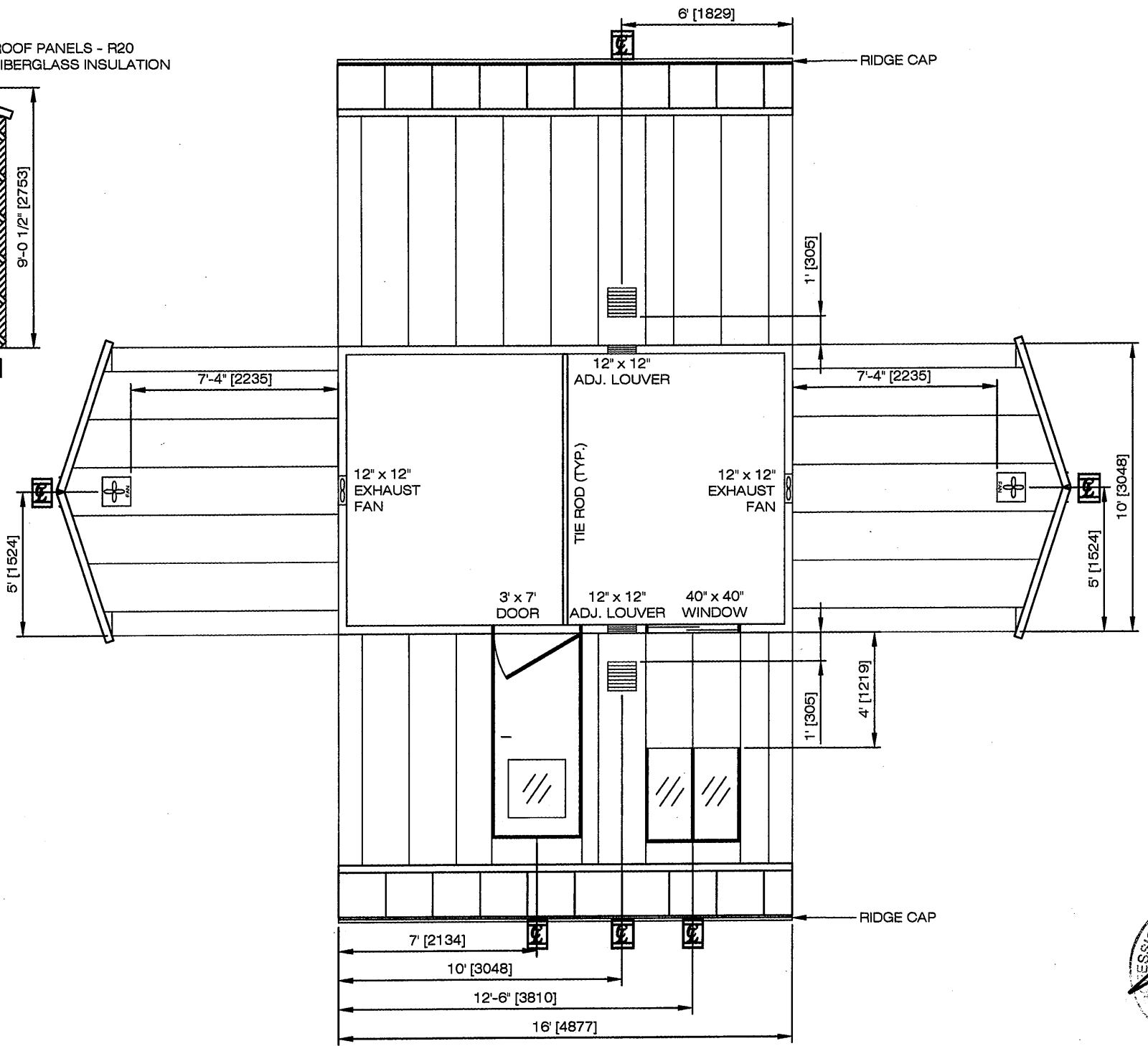
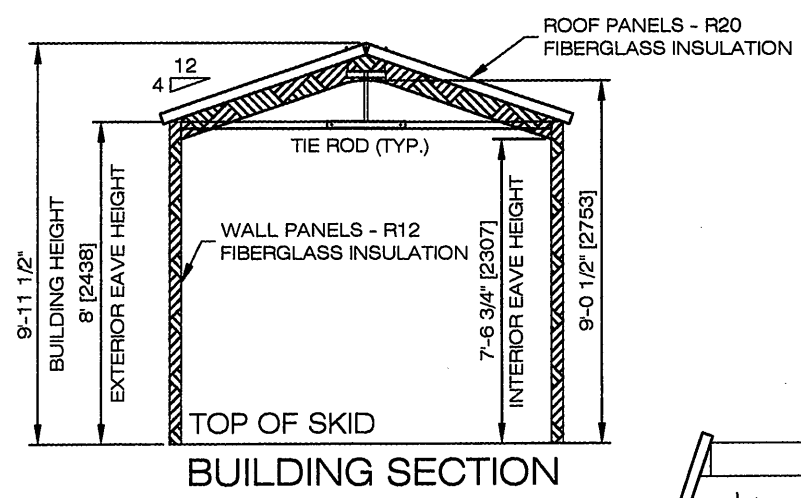
**P-ENG STAMP**

  
 JAN 27 2017

REV	DESCRIPTION	DRAWN BY	DATE
1	AS BUILT - ADDED CHANNEL LIST FOR STAMPED ENGINEERED DRAWINGS	DF	2017.01.19
0	ISSUED FOR CONSTRUCTION	FS	2016.12.08
A	ISSUED FOR APPROVAL	GC	2016.12.06
REVISIONS			

  
**METALEX**  
**METAL BUILDINGS INC.**  
 4204 - 46 Avenue, PO Box 1058  
 Stettler, AB T0C 2L0  
 P - 403.742.1300 | F - 403.742.1308  
 E - info@mmbi.ca | W - www.mmbi.ca

PROJECT:	16182	CLIENT:	Envision Manufacturing & Supply Ltd.
LOCATION:	06-18-066-04 W6M		
DWG NO.:	17199-S	TITLE:	10' 0" x 16' 0" x 8' 0" SELF FRAME BUILDING GABLE STYLE 4:12 PITCH
SHEET NO.:	1 OF 3	SCALE:	NTS






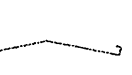
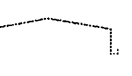
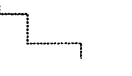
REV	DESCRIPTION	DRAWN BY	DATE
-	-	-	-
-	-	-	-
-	-	-	-
1	AS BUILT - ADDED CHANNEL LIST FOR STAMPED ENGINEERED DRAWINGS	DF	2017.01.19
0	ISSUED FOR CONSTRUCTION	FS	2016.12.08
A	ISSUED FOR APPROVAL	GC	2016.12.06
REVISIONS			







**METALEX**  
**METAL BUILDINGS INC.**  
 4204 - 46 Avenue, PO Box 1058  
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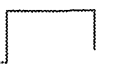

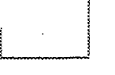
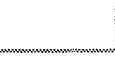

PROJECT:	16182
LOCATION:	06-18-066-04 W6M
DWG NO.:	17199-S
SHEET NO.:	2 OF 3
SCALE:	NTS

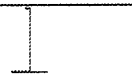


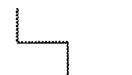

CLIENT:	EnVision Manufacturing & Supply Ltd.
TITLE:	10' 0" x 16' 0" x 8' 0" SELF FRAME BUILDING GABLE STYLE 4:12 PITCH








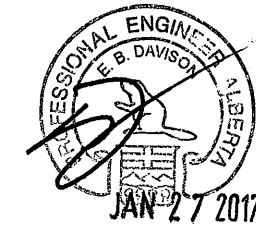
PART	QTY	LENGTH	COLOR	GA
 BASE FLASHING		55'	STONE GRAY (QC8305)	22
 BACK DRIP 4:12	2	120'	STONE GRAY (QC8305)	22
	2	74'	STONE GRAY (QC8305)	22
 RIDGE 4:12	2	144'		20
	1	96'		20
 RIDGE CAP 4:12	SMALL 1	108'	STONE GRAY (QC8305)	22
	BIG 1	108'	STONE GRAY (QC8305)	22
 RIDGE HOOD				
 CN N/A				

PART	QTY	LENGTH	COLOR	GA
 SIDE FLASHING	4	65 1/4'	STONE GRAY (QC8305)	22
 EAVESTROUGH				
 DOWNSPOUT				
 DOOR DRIP	1	SINGLE	STONE GRAY (QC8305)	22
 CANOPY				
 TRANSOM PANEL				

PART	QTY	LENGTH	COLOR	GA
 BOTTOM	6	120'		18
	4	96'		18
 TOP DRIP	4	96'		18
	2	128'		22
 PLAIN TOP				
 U CH. x BRACING	8	120'		22
 CUT OUT CH.				
 90°	4	96'		22

PART	QTY	LENGTH	COLOR	GA
 RIBS R20	18	R20'		26
 U CH. x ROOF	4	54 1/4'		22
 WINDOW FLASHING	1	40x40	STONE GRAY (QC8305)	22
 CONTAINMENT		55'	WHITE	26
 STEP OVER	1	SINGLE	STONE GRAY (QC8305)	22

PART	QTY	LENGTH	COLOR	GA
 FAN HOOD	2	12' x 12'	STONE GRAY (QC8305)	22
 FRAMES				
 UPRIGHT				
 RIDGE V.				
 Z CHANNEL				



REV	DESCRIPTION	DRAWN BY	DATE
-	-	-	-
1	AS BUILT - ADDED CHANNEL LIST FOR STAMPED ENGINEERED DRAWINGS	DF	2017.01.19
0	ISSUED FOR CONSTRUCTION	FS	2016.12.08
A	ISSUED FOR APPROVAL	GC	2016.12.06
REVISIONS			

**METALEX**  
**METAL BUILDINGS INC.**

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Stettler, AB T0C 2L0  
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E - Info@mmbi.ca | W - www.mmbi.ca

PROJECT:	16182	CLIENT:	Envision Manufacturing & Supply Ltd.
LOCATION:	06-18-066-04 W6M		
DWG NO.:	17199-S	TITLE:	10' 0" x 16' 0" x 8' 0" SELF FRAME BUILDING GABLE STYLE 4:12 PITCH
SHEET NO.:	3 OF 3	SCALE:	NTS



METAL BUILDINGS INC.

BOX 1058, STETTLER, AB T0C 2L0
PH: (403) 742-1300 FAX: (403) 742-1308

Certificate of Design and Manufacturing Conformance

This Certificate is to affirm that all components of the steel building system described below, to be supplied by METALEX Metal Buildings Inc. certified in accordance with CSA-A660, have been or will be, designed and fabricated in accordance with the following Standards to carry the loads and load combinations specified.

1. DESCRIPTION

Table with 2 columns: Description and Value. Rows include Manufacturer's Name and Address, Certificate No., Order Number, Building Type and Size, Intended Use, Importance Category, Site Location, Building Code, Builder's Name, and Owner's Name.

2. DESIGN STANDARDS

National Building Code of Canada, 2010, Part 4: Structural Design
CAN/CSA-S16-09, Design of Steel Structures
CAN/CSA-S136-07, North American Specification for the Design of Cold-Formed Steel Structural Members
Other (specify) \_\_\_\_\_ dated \_\_\_\_\_

Engineer's Initials\*

Handwritten initials and signature on lines.

3. MANUFACTURING STANDARDS

- (a) Fabrication has been, or will be, in accordance with CAN/CSA-S16 and CAN/CSA-S136, as applicable.
(b) Welding has been, or will be performed, in accordance with CSA-W59 and CAN/CSA-S136, as applicable.
(c) The Manufacturer has been certified in accordance with CSA-W47.1, for Division 1 or 2, and/or CSA-W55.3, if applicable.
(d) Welders have been qualified in accordance with CSA-W47.1.

4. PURLIN STABILITY

Purlin braces are provided in accordance with CAN/CSA-S136, Clause D3 and Appendix B, Clause D3.2.3. In particular, for a standing seam roof supported on movable clips, braces providing lateral support to both top and bottom purlin flange have been or will be provided. The number of rows is determined by analysis but in no case is less than 1 for spans up to 7m inclusive or less than 2 for spans greater than 7m.

N/A

5. LOADS

(a) Snow and Rain Load

Table with 2 columns: Load Description and Value. Values include 2.2, 6.1, 0.8, 1.0, 1.86, and N/A.

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(b) Full and Partial Snow Load

- (i) Applied on any one and any two adjacent spans of continuous purlins.
(ii) Applied on any one and any two adjacent spans of modular rigid frames with continuous roof beams.
(iii) Applied as described for the building geometry in NBC, Part 4, and in the User's Guide - NBC 2010 Structural Commentaries (Part 4 of Division B), Commentary G: Snow Loads.

N/A

(c) Wind Load

Table with 2 columns: Load Description and Value. Values include 0.47 and 1.0.

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\*Initial each true statement. Mark N/A if statement or section does not apply.

2

**(d) Wind Load Application**

- (i) Applied as per *NBC*, Part 4, Sub-section 4.1.7.
- (ii) Pressure coefficients as per User's Guide - *NBC* 2010 Structural Commentaries (Part 4 of Division B), *Commentary I: Wind Loads*, Figures I7 through I14.
- (iii) Building internal pressure Category 2 per User's Guide - *NBC* 2010 Structural Commentaries, (Part 4 of Division B), *Commentary I: Wind Loads*.

**(e) Crane Loads (where applicable)**

Type	_____	(top-running) (under-running) (jib)	<u>N/A</u>
Capacity	_____	(tonnes)	
Wheel base	_____	(m)	
Maximum static, vertical wheel load	_____	(kN)	
Vertical impact factor	_____		
Lateral factor	_____ (%)	lateral wheel load	_____ (kN)
Longitudinal factor	_____ (%)	maximum longitudinal load	_____ (kN/side)

**(f) Mezzanine Live Load**

\_\_\_\_\_ (kPa) N/A

**(g) Earthquake (Seismic) Load**

Applied as per *NBC*, Part 4, Sub-section 4.1.8 N/A

Sa (0.2) \_\_\_\_\_ Sa (0.5) \_\_\_\_\_ Sa (1.0) \_\_\_\_\_ Sa (2.0) \_\_\_\_\_  
 Site Class \_\_\_\_\_ Fa \_\_\_\_\_ Fv \_\_\_\_\_ Ie \_\_\_\_\_

**(h) Other Live Loads (specify)**

\_\_\_\_\_ N/A

**(i) Dead Loads**

Dead load of building components is incorporated in the design N/A

Collateral load (mechanical, electrical, ceiling, sprinklers, etc.) \_\_\_\_\_ (kPa)  
 Mezzanine \_\_\_\_\_ (kPa)  
 Other (specify) \_\_\_\_\_ ( )

**(j) Load Combinations**

Applied in accordance with *NBC*, Part 4, Section 4.1. 2

**6. GENERAL REVIEW DURING CONSTRUCTION**

The Manufacturer does not provide general review during construction for regulatory purposes.

\*Initial each true statement. Mark N/A if statement or section does not apply.

**7. CERTIFICATION BY ENGINEER**

I, E. B. DAVISON, a Professional Engineer registered or licensed to practice in the Province or Territory of ALBERTA, hereby certify that I have reviewed the design and manufacturing process for the steel building system described. I certify that the foregoing statements, initialed by me, are true.

Name E. B. DAVISON

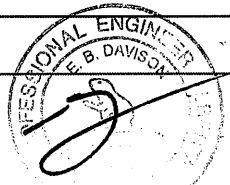
Signature [Signature]

Title \_\_\_\_\_

Affiliation \_\_\_\_\_

Date Jan 27 - 2017

Professional Seal



ENVISION MANUFACTURING & SUPPLY LTD.  
QUALITY CONTROL MANUAL

(For Construction/Repair/Alteration of Pressure Piping Systems Less Than or Equal to 500 Litres, Aggregate Internal Volume)

Owner: Paramount Resources Contractor: EnVision Manufacturing & Supply AQP: AQP-1584

Plant Location: 06-18-066-04 W6M Job: 16182

Material List				Piping Sketch (Reference attached drawings if appropriate)				
Item #	Description	Material Grade & Spec.	SCH/Rating	(Use for recording RT No's & welder symbols)				
1	FLANGE 2" CL150 RFWN	SA-350-LF2	SCH40	See Attached Drawing No. 16182 DUAL-25HP-INST AIR SPOOL				
2	UNION 2" THRDxSW	SA-105N	3000CL					
3	PIPE SEAMLESS 2"	SA-333 GR 6	SCH40					
Line #	Design Pressure	Design Temp Min/Max	Corr. Allowance	Code ASME B31.1/B31.3	Service (e.g., Normal, Cat. D, M, K)	Severe Cyclic Yes/No	Test Pressure	Test Medium
2231-AO-2"-AL-17	225 psi	-50/650F	1/16	B31.3	Normal	No	337 psi	Water

NOTE: Pneumatic tests must have prior approval from ABSA

Welding Procedure Specification Numbers: ENV-1 REV 0

Line #	MT/PT Extent %	Radiography Extent %	Hardness Test	Ultrasonic - Other NDE Description/Extent %	Other Requirements
2231-AO-2"-AL-17	N/A	10%	N/A	N/A	N/A

NDE Contractor: Hunt Inspection Ltd. Post Weld Heat Treatment (Yes/N.A): N/A

Post Weld Heat Treatment Time/Temp.: N/A PWHT Contractor: N/A

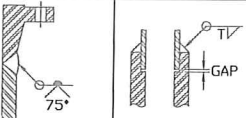
Approved by Owner: \_\_\_\_\_  
Print & Sign \_\_\_\_\_ Date \_\_\_\_\_

Approved by Contractor: Tasha McDonald *Tasha McDonald* Jan 4, 2017  
Print & Sign \_\_\_\_\_ Date \_\_\_\_\_

Comments: Report #'s T416113-5MT & T4161132-4.

WORK COMPLETED AND ACCEPTED (AB-83 completed)

Contractor Sign-Off: TASHA McDONALD *Tasha McDonald* Jan 17, 2017  
Print & Sign \_\_\_\_\_ Date \_\_\_\_\_

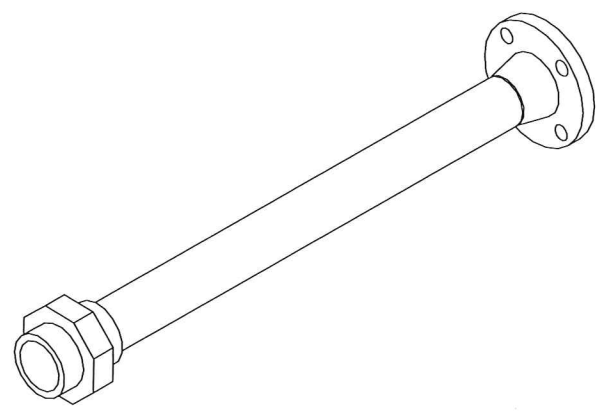
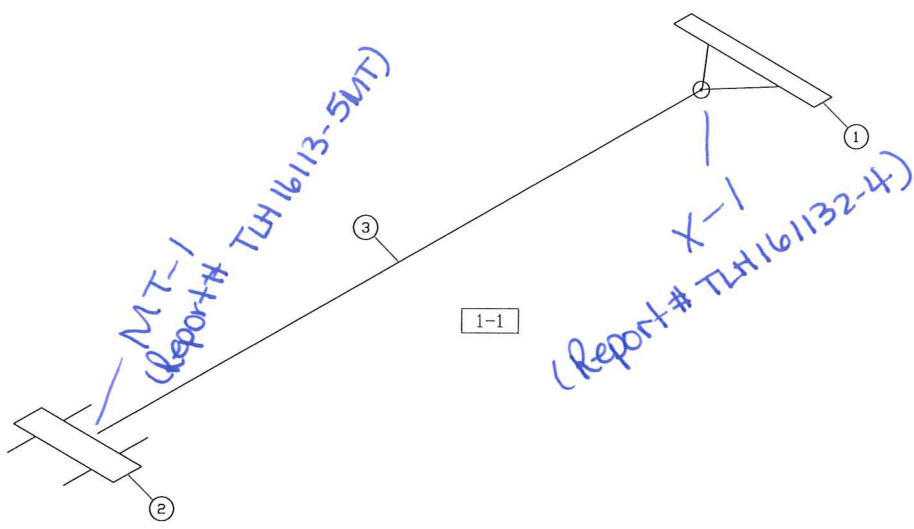


WELD DETAIL 1  
WPS: ENV-1

WELD DETAIL 2  
WPS: ENV-1

3/32" WELD GAP

BILL OF MATERIALS							
ITEM	QTY	PN	SIZE	DESCRIPTION	MATERIAL	LENGTH	HEAT #
1	1	-	2"	FLANGE - CL150 RFWN x SCH.40	SA-350-LF2	-	-
2	1	-	2"	UNION - CL3000 THRD x SW	SA-105-N	-	-
3	1	-	2"	PIPE - SMLS x SCH.40	SA-333-GR6	2'-1 5/16'	642mm



**Intertek**  
 Reviewed  
 Witnessed  
 Initial: [Signature]  
 Date: 01/09/17  
 CA - 0077

Job # 16182

DESIGN DATA	
DESIGN PRESSURE:	225 PSI
CORROSION ALLOWANCE:	1/16"
RADIOGRAPHY:	10%
PWHT:	N/A
HYDROTEST:	338 PSI
WPS:	3603.2
AQP:	1584

All welds by Roy Wells "T"

REV	DD/MM/YYYY	REVISION	DF	NM	TB
0	29/11/2016	ISSUED FOR CONSTRUCTION			
			BY	CHK	APP



CLIENT: PARAMOUNT RESOURCES c/o GAS LIQUIDS ENGINEERING			
INSTRUMENT AIR PACKAGE 20HP DUAL INSTRUMENT AIR			
PART#	DWG#		REV
XXXX	16182 DUAL-25HP-INST AIR SPOOL		0

[Signature]



## SECTION 3

Bay 2, 3809 53<sup>rd</sup> Avenue  
Lacombe, AB  
T4L 2L6  
403.304.8314



the pressure equipment safety authority

9410 - 20 Ave N.W.  
Edmonton, Alberta, Canada T6N 0A4  
Tel: (780) 437-9100 / Fax: (780) 437-7787

**Attention:** Natasha McDonald  
ENVISION MANUFACTURING & SUPPLY LTD  
PO BOX 5424  
LACOMBE, AB T4L 1X1

The welding procedure, tracking number 2016-01387, originally received on March 04, 2016 was surveyed and accepted in accordance with the requirements of ASME section IX for registration as follows:

**Reg. No. :** WP-3603.2

**Accepted on:** March 07, 2016

**Reg Type:** New Design

**Spec. No. :** ENV-1 REV 0

Design registered in the name of : ENVISION MANUFACTURING & SUPPLY LTD

An invoice covering survey and registration fees will be forwarded from our Revenue Accounts.

Enclosed is a stamped welding procedure for your reference.

*Please note:*

- (1) Construction shall be completed per the requirements of the applicable construction code, and*
- (2) the acceptance of this registration does not allow the use of this welding procedure in the construction, modification, on any boiler, pressure vessel, pressure piping system or fitting in Alberta unless the contractor/manufacturer has registered a Quality Control System for such work with ABSA.*

Sincerely,

REINHART, JASON, P. Eng.

WELDING PROCEDURE SPECIFICATION NO.: ENV-1 (Rev. 0)

WELDING PROCEDURE QUALIFICATION RECORD NO.(S): ENV-1-1 (Rev. 0)  
ENV-1-2 (Rev. 0)

QUALIFIED IN ACCORDANCE WITH ASME SECTION IX FOR

Base Metal (Typical): Std. Appl.: P1 to P1  
(SA 36, SA 106 Gr. B, SA 105, SA 516 Gr. 70, etc.)  
Notch Appl.: P1 Groups 1 & 2 to P1 Groups 1 & 2  
(SA 333 Gr. 6, SA 350 Gr. LF2, SA 420 Gr. WPL6, SA 516 Gr. 70 etc.)  
Process(es): SMAW Weld Types: GROOVE & FILLET  
Position: ALL POSITIONS Diameter: ALL DIAMETERS  
Filler Metal: Std. Appl.: E6010, E7018, E7018-1  
Notch Appl.: E6010, E7018-1

**BASE METAL CONDITIONS & GROOVE THICKNESS RANGE QUALIFIED:**

STANDARD APPLICATIONS AS WELDED

BASE METAL THICKNESS RANGE 0.062 to 1.00 in. inclusive

NOTCH TOUGHNESS APPLICATIONS TO -50 °F AS WELDED

BASE METAL THICKNESS RANGE 0.116 to 1.00 in. inclusive

**COMBINED DEPOSITED WELD METAL THICKNESS**

ASME B31.1 1.00 in. maximum

ASME B31.3 1.00 in. maximum

ASME SECTION VIII, DIVISION 1 1.00 in. maximum

**ABSA**  
SAFETY CODES ACT - PROVINCE OF ALBERTA  
WELDING PROCEDURE

Reg. No. WP 3603.2  
Spec No. ENV-1 (Rev. 0)  
Weld Process SMAW  
Matl. Gr. P No. 16r. 1+2 to P No. 16r. 1+2  
Elect Gr. F No. 3+4 A No. 1  
Th. Qual For. 25.4mm P.W.H.T. NO  
MIN TH QUAL 2.9mm, CW-46°C

Yr. 16 Mo. 3 Day 7 Signed [Signature]  
JASON BENHART, P.ENG.  
WELDING SPECIALIST

PROVINCIAL REGISTRATION

This WPS was prepared to the requirements of ASME Section IX 2015 and includes some of the additional requirements of the construction codes listed. The application of this WPS is outside the work scope of SGS Canada Inc.

Prepared By: Tyler Penier, C.E.T., I.W.T.  
Signed: [Signature]  
Date: February 8, 2016

Reviewed By: Colin Burnette, C.E.T.  
Signed: [Signature]  
Date: FEBRUARY 9, 2016

(File C16-071)



## QW-482 WELDING PROCEDURE SPECIFICATION (WPS)

Company Name EnVision Manufacturing & Supply Ltd.  
Welding Procedure Specification No. ENV-1 (Rev. 0) Date February 8, 2016  
Supporting PQR No.(s) ENV-1-1 (Rev. 0), ENV-1-2 (Rev. 0)  
Welding Process(es) Shielded Metal Arc Welding (SMAW)

### JOINTS (QW-402)

Joint Design All ASME groove & fillet, reference construction drawing for joint details.  
Where joint details are not specified, refer to figures 1 to 15 attached  
Root Opening As per attached typical groove designs, see figures 1 to 15 attached  
Backing With or without Retainers Not required

### BASE METALS (QW-403)

P-Number Std. Appl.: P1 To P-Number P1  
P-Number Notch Appl.: P1 Groups 1 & 2 To P-Number P1 Groups 1 & 2  
Thickness Range: Groove Std. Appl.: 0.062 to 1.00 in.  
Notch Appl.: 0.116 to 1.00 in. inclusive (1)  
Fillet Std. Appl.: All base metal thicknesses  
Notch Appl.: 0.116 to 8.00 in. inclusive  
Pipe Diameter Ranges: Groove All diameters  
Fillet All diameters  
Deposited Weld Metal (Per Pass) E6010: 0.188 in. maximum  
E7018-1: 0.250 in. maximum

(1) Reference thickness limitations for tests on welds in fabrication or assembly in ASME B31.3 Table 323.3.1 - Impact Testing Requirements for metals.

### FILLER METALS (QW-404)

	SMAW	SMAW
Specification No. (SFA)	<u>SFA 5.1</u>	<u>SFA 5.1</u>
AWS No. (Class)	<u>Std. Appl.: E6010</u>	<u>E7018, E7018-1</u>
	<u>Notch Appl.: E6010</u>	<u>E7018-1</u>
F-No.	<u>F3</u>	<u>F4</u>
A-No.	<u>A1</u>	<u>A1</u>
Diameter	<u>3/32 to 3/16 in. inclusive</u>	<u>3/32 to 1/4 in. inclusive</u>
Deposited Weld Metal Thickness Range:		
Groove	<u>0.188 in. max. (2)</u>	<u>0.812 in. max. (2)</u>
Fillet	<u>All fillet sizes (3)</u>	<u>All fillet sizes</u>

(2) Combined deposited weld metal thickness shall not exceed 1.00 in. for ASME B31.1, ASME B31.3 and ASME Section VIII, Div.1.

(3) E6010 is restricted to a single pass for fillet weld applications requiring an MDMT less than -20 °F.

### POSITION (QW-405)

Position of Groove All positions Position of Fillet All positions  
Weld Progression E6010: Vertical up or down E7018-1: Vertical up

**PREHEAT (QW-406)**

Preheat Temperature (Minimum) See attached preheat sheet prior to welding.  
 Interpass Temperature (Maximum) Std. Appl.: 700 °F Notch Appl.: 450 °F  
 Preheat Maintenance See attached preheat sheet prior to welding. Preheat maintenance is not required if welding is interrupted or after the completion of welding unless required by the code of construction.

**POSTWELD HEAT TREATMENT (QW-407)**

With or Without Without  
 Temperature Range N/A Time Range N/A

**ELECTRICAL CHARACTERISTICS (QW-409)**

Current Direct Polarity Reverse, electrode positive  
 Amps See Tables 1 & 2 Volts See Tables 1 & 2  
 Notch Appl.: Maximum Heat Input

Base Metal Thickness Range	E6010 Electrode	E7018-1 Electrode
0.116 - 0.499 in.	35,455 J/in.	56,368 J/in.
0.500 in. and greater	36,290 J/in.	71,400 J/in.

**TECHNIQUE (QW-410)**

Manual or Automatic Manual  
 Multiple or Single Pass Per Side (4) Std. Appl.: Single or Multiple  
Notch Appl.: Multiple  
 String or Weave String or Weave  
 Travel Speed See Table 1 & 2  
 Initial & Interpass Cleaning Brushing, chipping or grinding as required  
 Method of Back Gouging Air carbon arc, back-grind as required  
 Peening Not permitted  
 Use of Thermal Process N/A

(4) Multiple layers shall be used for ASME B31.1 and ASME B31.3 when the nominal material thickness is greater than 0.188 in.

**TABLE 1 - WELDING PARAMETERS****Standard Applications**

Process	Filler Metal	Diameter in.	Current Type & Polarity	Amperage Range	Voltage Range	Travel Speed i.p.m.
SMAW	E6010	3/32	DCRP	50 - 100	18 - 32	1.0 - 12
SMAW	E6010	1/8	DCRP	60 - 140	19 - 32	1.5 - 14
SMAW	E6010	5/32	DCRP	115 - 250	21 - 32	2.0 - 16
SMAW	E6010	3/16	DCRP	120 - 300	21 - 32	2.0 - 18
SMAW	E7018, E7018-1	3/32	DCRP	60 - 110	18 - 26	1.0 - 12
SMAW	E7018, E7018-1	1/8	DCRP	90 - 170	19 - 28	1.5 - 14
SMAW	E7018, E7018-1	5/32	DCRP	110 - 220	20 - 30	1.5 - 16
SMAW	E7018, E7018-1	3/16	DCRP	160 - 320	20 - 30	2.0 - 20
SMAW	E7018, E7018-1	7/32	DCRP	240 - 340	20 - 32	3.0 - 22
SMAW	E7018, E7018-1	1/4	DCRP	275 - 360	21 - 32	4.0 - 22

Note: Size of electrode, filler metal, number of passes, voltage, amperage, and travel speed will vary with position, joint thickness, joint type etc.

**TABLE 2 - WELDING PARAMETERS****Notch Toughness Applications**

Process	Filler Metal	Diameter in.	Current Type & Polarity	Amperage Range	Voltage Range	Travel Speed i.p.m.
SMAW	E6010	3/32	DCRP	50 - 100	18 - 32	1.5 - 12
SMAW	E6010	1/8	DCRP	60 - 140	19 - 32	1.9 - 14
SMAW	E6010	5/32	DCRP	115 - 250	21 - 32	4.0 - 16
SMAW	E6010	3/16	DCRP	120 - 300	21 - 32	4.2 - 18
SMAW	E7018-1	3/32	DCRP	60 - 110	18 - 26	1.0 - 12
SMAW	E7018-1	1/8	DCRP	90 - 170	19 - 28	1.5 - 14
SMAW	E7018-1	5/32	DCRP	110 - 220	20 - 30	1.9 - 16
SMAW	E7018-1	3/16	DCRP	160 - 320	20 - 30	2.7 - 20
SMAW	E7018-1	7/32	DCRP	240 - 340	20 - 32	4.1 - 22
SMAW	E7018-1	1/4	DCRP	275 - 360	21 - 32	4.9 - 22

Note: Welding parameters shall be adjusted to insure that the maximum heat input value specified in QW-409 above is not exceeded.  
Heat Input (joules per inch) = (Amperage X Voltage X 60) / Travel Speed (i.p.m.)

**TYPICAL JOINT DESIGNS**

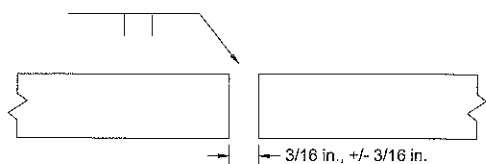


Figure 1  
Single Square Butt

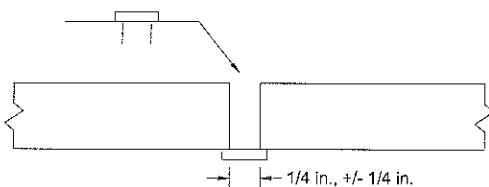


Figure 2  
Single Square Butt with Backing Strip

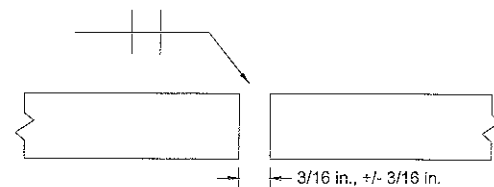


Figure 3  
Double Square Butt

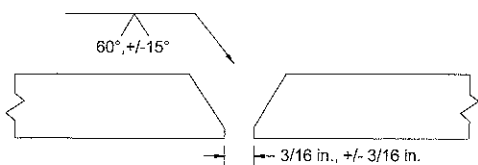


Figure 4  
Single Vee Butt

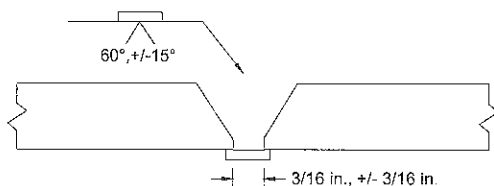


Figure 5  
Single Vee Butt with Backing Strip

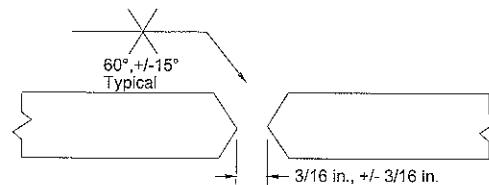


Figure 6  
Double Vee Butt

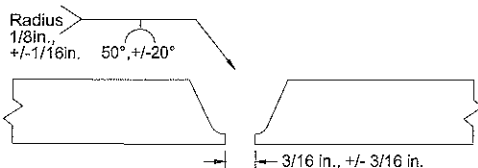


Figure 7  
Single U Butt

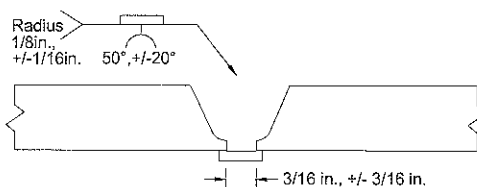


Figure 8  
Single U Butt with Backing Strip

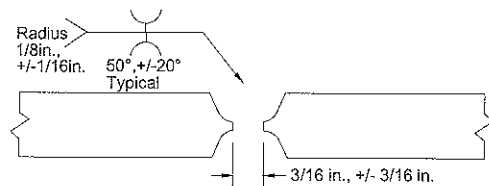


Figure 9  
Double U Butt

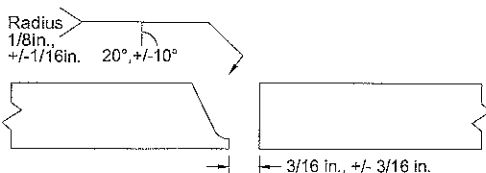


Figure 10  
Single J Butt

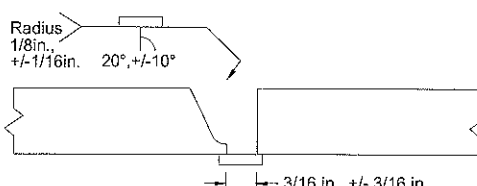


Figure 11  
Single J Butt with Backing Strip

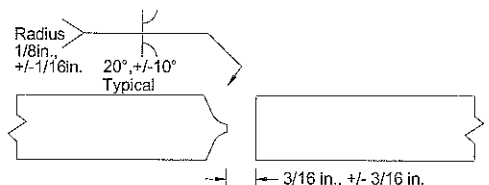


Figure 12  
Double J Butt

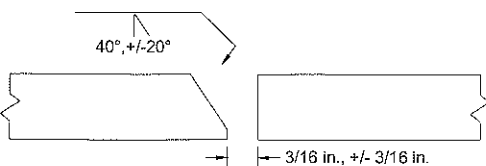


Figure 13  
Single Bevel Butt

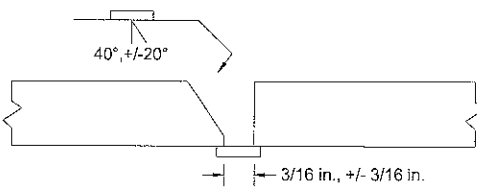


Figure 14  
Single Bevel Butt with Backing Strip

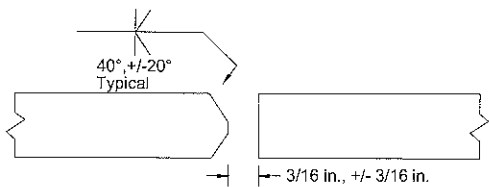


Figure 15  
Double Bevel Butt

Additional joint designs and internal misalignment on circumferential welds shall be within the dimensional limits stated on the approved construction drawing and/or the engineering design.

**PREHEAT****P-No. 1**

1. Welds joining pressure parts or attachments shall be preheated to not less than the minimum preheat temperatures stated in paragraph 3. If welding is interrupted, the weld joint and adjacent areas shall be reheated to the minimum preheat temperature stated in paragraph 3, prior to the start of welding.
2. Preheat temperatures shall be checked by the welder or inspector, using temperature indicating crayons or other reputable methods.
3. Minimum preheating temperatures shall be as follows:

**PRESSURE VESSELS IN ACCORDANCE WITH ASME SECTION VIII, DIV. 1-2015**

NOMINAL THICKNESS	MINIMUM PREHEAT TEMPERATURE
0 to 1.25 in	50 °F
Greater than 1.25 in.	200 °F
Greater than 1.0 in. & specified maximum carbon content greater than 0.30%.	175 °F

- The conditions of UW-30 shall apply for base metal temperatures below 32 °F.
- The preheat zone shall extend at least 3.0 in. beyond each edge of the weld.
- Nominal thickness is the thicker of the materials being joined at the weld.

**PROCESS PIPING IN ACCORDANCE WITH ASME B31.3-2014**

GREATER MATERIAL THICKNESS	MINIMUM PREHEAT TEMPERATURE
Less than or equal to 1.0 in.	50 °F
Greater than 1.0 in. & specified maximum carbon content less than or equal to 0.30%.	200 °F
Greater than 1.0 in. & specified maximum carbon content greater than 0.30%.	200 °F

- The preheat zone shall be at or above the specified minimum temperature in all directions from the point of welding for a distance of the larger of 3 in. or 1.5 times the greater nominal thickness. The base metal temperature for tack welds shall be at or above the specified minimum temperature for a distance not less than 1 in. in all directions from the point of welding.
- Greater material thickness is that of the nominal material thickness of the thicker of the materials being joined at the weld.

**POWER PIPING IN ACCORDANCE WITH ASME B31.1-2014**

GREATER MATERIAL THICKNESS	MINIMUM PREHEAT TEMPERATURE
Less than or equal to 1.0 in.	50 °F
Greater than 1.0 in. & specified maximum carbon content less than or equal to 0.30%.	200 °F
Greater than 1.0 in. & specified maximum carbon content greater than 0.30%.	200 °F

- The base metal temperature for the parts to be welded shall be at or above the specified minimum temperature in all directions from the point of welding for a distance of the larger of 3 in. or 1.5 times the greater nominal thickness (as defined in paragraph 132.4.3). The base metal temperature for tack welds shall be at or above the specified minimum temperature for a distance not less than 1 in. in all directions from the point of welding.
- Greater material thickness is the thicker of the pressure-retaining materials being joined at the weld.

## QW-483 PROCEDURE QUALIFICATION RECORD (PQR)

Company Name EnVision Manufacturing & Supply Ltd.  
Procedure Qualification Record No. ENV-1-1 (Rev. 0) Date January 28, 2016  
Welding Process(es) Shielded Metal Arc Welding (SMAW)

### JOINTS (QW-402)

Joint Design Butt joint, single vee groove, see next page  
Root Opening See next page  
Backing Without Retainers Without

### BASE METALS (QW-403)

Material Specification No. SA 333 to SA 350 Type or Grade Gr. 6 to Gr. LF2  
P-No. P1 Group 1 To P-No. P1 Group 2 Thickness 0.232 in.  
Heat Number 1531558V to 15/40083 Carbon Equivalent (1) 0.239 to 0.396 (2)  
Diameter 6.625 in. O.D.  
Other Schedule 40 pipe machined to 0.232 in. wall thickness  
Deposited Weld Metal (Per Pass) Did not exceed 0.094 in. for E6010,  
and 0.125 in. for E7018-1

- (1) Per CSA Z662 Carbon Equivalent formula. See chemical composition of  
heat / ladle analysis on attached material test reports.  
(2) Boron was not listed on the SA 350 Gr. LF2 ladle analysis and was assumed to be zero  
for C.E. calculations.

### FILLER METALS (QW-404)

	SMAW	SMAW
Specification No. (SFA)	<u>SFA 5.1</u>	<u>SFA 5.1</u>
AWS No. (Class)	<u>E6010 (3)</u>	<u>E7018-1 (4)</u>
F-No.	<u>F3</u>	<u>F4</u>
A-No.	<u>A1</u>	<u>A1</u>
Diameter	<u>See attached sketch</u>	
Deposited Weld Metal Thickness	<u>0.094 in.</u>	<u>0.138 in.</u>

(3) The Lincoln Electric Company: Fleetweld 5P+  
(4) ESAB: OK 55.00

### POSITION (QW-405)

Position of Groove 5G Weld Progression Vertical up

### PREHEAT (QW-406)

Preheat Temperature 60 °F Interpass Temp. (Max.) 350 °F  
Preheat Maintenance Weld was allowed to cool to ambient temperature in still air after  
welding was completed.

### POSTWELD HEAT TREATMENT (QW-407)

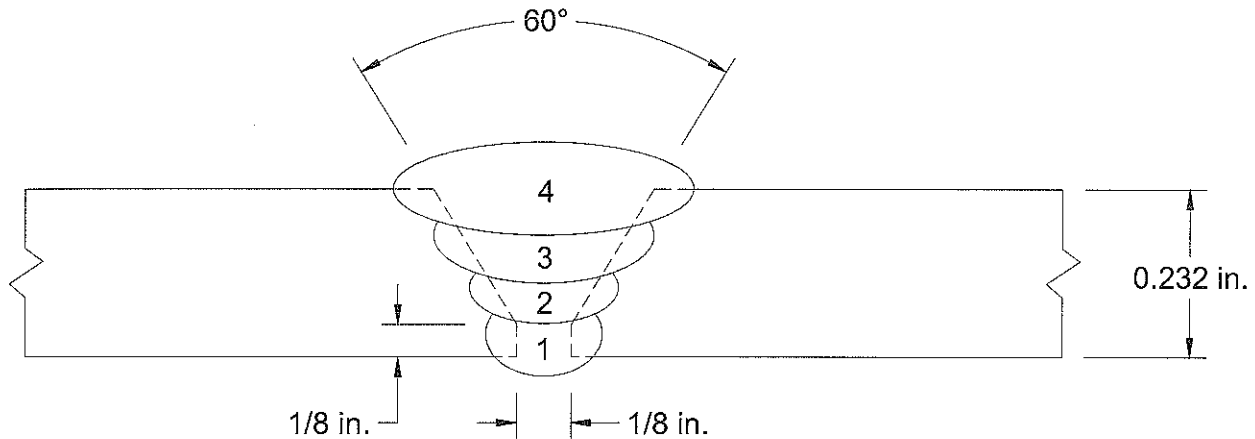
With or Without Without  
Temperature N/A Time N/A

**ELECTRICAL CHARACTERISTICS (QW-409)**

Current Direct Polarity Reverse, electrode positive  
 Amps See below Volts See below  
 Heat Input E6010: 35,455 J/in. maximum E7018-1: 56,368 J/in. maximum

**TECHNIQUE (QW-410)**

Manual or Automatic Manual  
 Multiple or Single Pass Per Side E6010: Single E7018-1: Multiple  
 String or Weave E6010: String E7018-1: String and Weave  
 Travel Speed See below  
 Initial & Interpass Cleaning Brushing, chipping and grinding as required  
 Method of Back Gouging Not conducted  
 Peening Not conducted  
 Use of Thermal Process N/A



Pass	Process	Filler Metal	Diameter in.	Current Type & Polarity	Amperage Range	Voltage Range	Travel Speed i.p.m.
1	SMAW	E6010	1/8	DCRP	70 - 80	24 - 28	3.3
2	SMAW	E7018-1	3/32	DCRP	80 - 90	19 - 23	10.2
3	SMAW	E7018-1	3/32	DCRP	80 - 90	19 - 23	6.0
3	SMAW	E7018-1	3/32	DCRP	80 - 90	19 - 23	1.9

**TENSILE TEST (QW-150)**

Sample No.	Width in.	Thickness in.	Area sq. in.	Ultimate Load lbf	Ultimate Stress psi	Fracture Type & Location
T1	0.752	0.167	0.126	8,880	70,600	Partial Cup & Cone Parent Metal (SA 333 Gr. 6)
T2	0.752	0.169	0.127	9,000	70,700	Partial Cup & Cone Parent Metal (SA 333 Gr. 6)

**GUIDED BEND TEST (QW-160)**

Type & Figure No.	Result	Type & Figure No.	Result
QW-462.3a, TRB - R1	Pass	QW-462.3a, TFB - F1	Pass
QW-462.3a, TRB - R2	Pass	QW-462.3a, TFB - F2	Pass

**CHARPY V-NOTCH IMPACT TEST**

Type of Test Charpy V-Notch Orientation Transverse  
 Test Temperature -50 °F Specimen Size 0.394 X 0.197 in.

Specimen Number	Notch Location	Impact Values ft-lbf
H2.1	Weld Metal	14
H2.2	within 1/16 in.	29
H2.3	of root	13
H3.1	Gr.6 - HAZ	49
H3.2	1/4 - 1/2t from	19
H3.3	cap surface	19
J3.1	Gr. LF2 - HAZ	19
J3.2	1/4 - 1/2t from	21
J3.3	cap surface	24

**OTHER TESTS**

Vickers Hardness - see attached Laboratory Test Report No.: C16-071.1

Welders Name Alain Lacusta Certificate File No. W-18527  
 Tests Conducted By SGS Canada Inc.  
 Laboratory Test No. C16-071.1

We certify the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Code.

Manufacturer EnVision Manufacturing & Supply Ltd.

Date Feb 23, 2016 Signed Jashan





TENSILE / BEND TEST

Customer: EnVision Manufacturing & Supply Ltd.
PO Box 5424
Lacombe, AB
T4L 1X1

Laboratory Test No.: C16-071.1
Date: February 1, 2016

Attention: Tasha McDonald

PQR No.: ENV-1-1 (Rev. 0) Heat No.: 1531558V to 15/40083
Material: SA 333 Gr. 6 to SA 350 Gr. LF2
Size: 168.3 mm (6.625 in.) O.D. x 5.9 mm (0.232 in.) w.t.
Thermal Condition: As Welded

Governing Spec.: ASME Section IX - 2015

Instrument: Satec S/N: 1127

Table with 2 columns: SAMPLE NO. (QW-150) and properties (WIDTH, THICKNESS, AREA, ULTIMATE LOAD, ULTIMATE STRESS, FRACTURE TYPE, FRACTURE LOCATION) for T1 and T2.

Note: Imperial values calculated by direct conversion.

Table with 5 columns: SAMPLE TYPE (QW-462.3a), SAMPLE NO., RESULTS, Face Bend (F1, F2), Root Bend (R1, R2).

Test Conducted By: Oksana Shevchenko, C.E.T. / Timothy Colpitts, T.T., I.W.T. (Calgary)

Certified By: [Signature] L-A-B Accredited Certificate Number L2057-1 Testing
Eric Dacyk, C.E.T.

This report (or certificate) is issued by the Company under its General Conditions for Inspection and Testing Services (copy available upon request). The issuance of this report (or certificate) does not exonerate buyers or sellers from exercising all their rights and discharging all their liabilities under the Contract of Sale. Stipulations to the contrary are not binding on the Company. The Company's responsibility under this report (or certificate) is limited to proven negligence and will in no case be more than ten times the amount of the fees or commission. Except by special arrangement, samples, if drawn, will not be retained by the Company for more than 30 days. The information stated in this report (or certificate) is derived from the results of inspection or testing procedures carried out in accordance with the instructions of our Client, and/or our assessment of such results on the basis of any technical standards, trade custom or practice, or other circumstances which should in our professional opinion be taken into account.



CHARPY V-NOTCH IMPACT TEST

Customer: EnVision Manufacturing & Supply Ltd.
PO Box 5424
Lacombe, AB
T4L 1X1

Laboratory Test No.: C16-071.1
Date: February 1, 2016

Attention: Tasha McDonald

PQR No.: ENV-1-1 (Rev. 0) Heat No.: 1531558V to 15/40083
Material: SA 333 Gr. 6 to SA 350 Gr. LF2
Size: 168.3 mm (6.625 in.) O.D. x 5.9 mm (0.232 in.) w.t.
Thermal Condition: As Welded

Specimen Size: 10 x 5 mm (0.394 x 0.197 in.) Instrument: Satec, SI-1C SN:1363
Orientation: Transverse Capacity: 325 J (240 ft-lbf)
Test Temperature: -46 °C (-50 °F) Verified Range: 1.7 - 260 J (1.3 - 192 ft-lbf)
Governing Spec.: ASME Section VIII, Div. I, UG-84 - 2015

Table with 4 columns: Specimen Number, Notch Location, Joules, (ft-lbf). Rows include H2.1-H2.3, H3.1-H3.3, and J3.1-J3.3.

Note: Metric values calculated by direct conversion.

Test Conducted By: Alvin Mathew, T.T. (Calgary)

Certified By: Eric Dacyk, C.E.T. L-A-B Accredited Certificate Number L2057-1 Testing

This report (or certificate) is issued by the Company under its General Conditions for Inspection and Testing Services (copy available upon request). The issuance of this report (or certificate) does not exonerate buyers or sellers from exercising all their rights and discharging all their liabilities under the Contract of Sale.



### HARDNESS TEST

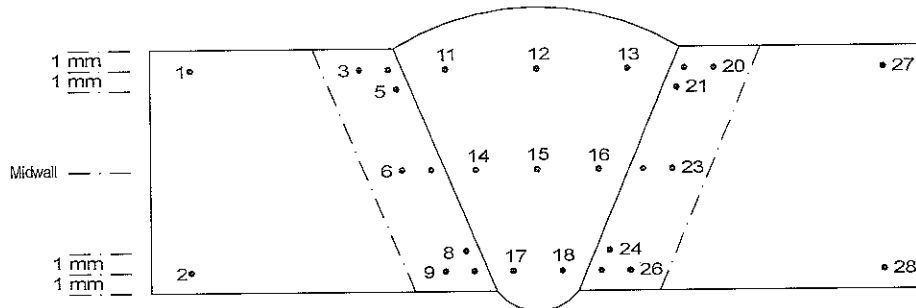
**Customer:** EnVision Manufacturing & Supply Ltd.  
 PO Box 5424  
 Lacombe, AB  
 T4L 1X1

**Laboratory Test No.:** C16-071.1  
**Date:** February 4, 2016

**Attention:** Tasha McDonald

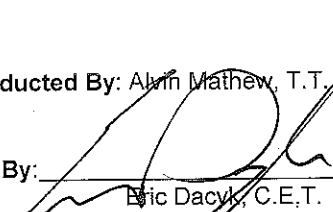
**PQR No.:** ENV-1-1 (Rev. 0) **Heat No.:** 1531558V to 15/40083  
**Material:** SA 333 Gr. 6 to SA 350 Gr. LF2  
**Size:** 168.3 mm (6.625 in.) O.D. x 5.9 mm (0.232 in.) w.t.  
**Thermal Condition:** As Welded

**Type of Test:** Vickers 10kg (HV10) **Instrument:** DuraScan 667  
**Governing Spec.:** ASTM E384-11<sup>s1</sup> & ANSI/NACE MR0175/ISO 15156:2015(E)



SA 350 Gr. LF2				Weld Metal		SA 333 Gr. 6			
Parent Metal		HAZ				HAZ		Parent Metal	
1	169	3	181	11	198	19	193	27	145
2	172	4	211	12	190	20	186	28	150
		5	208	13	182	21	192		
		6	203	14	182	22	200		
		7	194	15	194	23	195		
		8	198	16	192	24	194		
		9	199	17	191	25	191		
		10	198	18	184	26	187		

**Test Conducted By:** Alvin Mathew, T.T. (Calgary)

**Certified By:**  L-A-B Accredited Certificate Number L2057-1 Testing  
 Eric Dacyk, C.E.T.

This report (or certificate) is issued by the Company under its General Conditions for Inspection and Testing Services (copy available upon request). The issuance of this report (or certificate) does not exonerate buyers or sellers from exercising all their rights and discharging all their liabilities under the Contract of Sale. Stipulations to the contrary are not binding on the Company. The Company's responsibility under this report (or certificate) is limited to proven negligence and will in no case be more than ten times the amount of the fees or commission. Except by special arrangement, samples, if drawn, will not be retained by the Company for more than 30 days. The information stated in this report (or certificate) is derived from the results of inspection or testing procedures carried out in accordance with the instructions of our Client, and/or our assessment of such results on the basis of any technical standards, trade custom or practice, or other circumstances which should in our professional opinion be taken into account.

HENGYANG VALIN  
STEEL TUBE CO.,LTD

MILL TEST REPORT

(ACCORDING TO EN10204 3.1)

Add: 10 Dalixincun, Hengyang City, Hunan, P.R.China P.C.:421001

Tel and Fax: +86 734 8873739

E-mail: hstecc@hysteeltube.com

CUSTOMER	TRANS AM			CERTIFICATE NO.	C201516042-1				
CONTRACT NO.	2211002942-1	P.O.NO.	PO.CI-15-327-B (LOT A)	L/C NO.:	SFAHDS-00331	DATE:	2015-5-27	PAGE:	1/3
PRODUCT	SEAMLESS CARBON STEEL PIPE FOR OIL AND GAS USE.			DELIVERY CONDITION	N(HR)				
SPECIFICATION	ASTM A333-6-2013, ASME SA333-6-2013, API 5L X42N PSL-2 43TH EDITION, NACE MR-0175-2011/ISO 15156-2(REGION 3)-2009 /MR-0103-2012/SS (CSA Z245.1 GRADE 290 CATEGORY II-2014)		HEAT TREATMENT	920°C+10°C/-10°C					
GRADE	GR.6,X42N,GR.290			DIMENSIONS	6**0.280**20FT				
TOTAL BUNDLES:	TOTAL PIECES:		TOTAL LENGTH:		R		TOTAL WEIGHT:		mt

NO.	BATCH No.	HEAT No.	BUNDLES	PIECES	LENGTH ft	WEIGHT mt	TENSILE TEST ASTM A370						FLATTENING TEST
							SAMPLE TYPE/ ORIENTATION / SIZE(mm)/GAUGE LENGTH(mm):SVL25G0						
							T3(PSI)	YS(PSI)	RT0.5	EL(%)	R.A. (%)	YS/TS	
1	6E4131131	1531558V					67570/68005	51040/52345	39.0/38.0		0.76/0.77	ACCEPTABLE	

NO.	IMPACT TEST								NON METALLIC INCLUSION	GRAIN SIZE	HARDNESS TEST	
	NOTCH TYPE/ORIENTATION/TEMPERATURE(°C)/SIZE (mm):										NACE MR0175/ISO 15156-2(REGION 3)/MR0103	
	V8/L-52°C/10*5*55				V8/T-45°C/10*5*55						HV10	
	AK1 (J)	Av.(J)	% SHEAR AREA	LE	AK2 (J)	Av.(J)	% SHEAR AREA	LE				
1	131/126/125/	127	90/90/90/	1.90/1.80/1.80/	114/110/116/	113	90/90/90	1.60/1.50/1.51		1161.0/		

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



C6-9  
ASTM A333 Gr. 6  
SA 333 Gr. 6  
CSA Z245.1 Gr. 290  
API 5L Gr. X42N  
GNPS Sch 40  
Heat No. 1531558V  
Rec'd On: Nov. 10/15  
P.O. No.: 159224  
(Int. Reg. C1367)

PO# 159224 Item# 4  
 Heat Number: 1531558V  
 Trans Am Piping Products Ltd.  
 Shipment / Seq #: 15 - 1712  
 Rev'd By: SB

6" STD SEAMLESS CS PIPE  
 A333 GR 6 BE - SHL

HENGYANG VALIN  
STEEL TUBE CO.,LTD

MILL TEST REPORT

(ACCORDING TO EN10204 3.1)

Add: 10 Dalixincun, Hengyang City, Hunan, P.R.China P.C.421001

Tel and Fax: +86 734 8873739

E-mail: hstec@hysteeltube.com

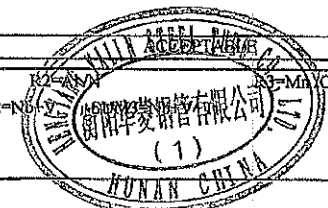
CUSTOMER	TRANS AM			CERTIFICATE NO.	C201516042-1				
CONTRACT NO.	2211002942-1	P.O.NO.	PO,CI-15-327-B (LOTA)	L/C NO.:	6FAHDE-00331	DATE:	2015-5-27	PAGE:	2/3
PRODUCT	SEAMLESS CARBON STEEL PIPE FOR OIL AND GAS USE.				DELIVERY CONDITION	N(HR)			
SPECIFICATION	ASTM A333-6-2013, ASME SA333-6-2013, API 5L X42N PSL-2 45TH EDITION, NACE MR-0175-2011/ISO 15156-2(REGION 3)-2009 /MR-0103-2012/SS (CSA Z245.1 GRADE 290 CATEGORY II-2014)			HEAT TREATMENT	920°C+10°C/-10°C				
GRADE	GR.6, X42N, GR.290				DIMENSIONS	6"*0.280"*20FT			
TOTAL BUNDLES:	TOTAL PIECES:	TOTAL LENGTH:	r	TOTAL WEIGHT:	mt				

NO	HEAT No. BATCH No.	Type	CHEMICAL COMPOSITION (%)																														
			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						*10000						*100	*1000											
	P																																
1	1531558V	H	9	31	129	33	6	21	15	8	14	29				11	11		8		14	62	1	18	32	68.2	17.2	28.2			14.3		
	6E4131131	P	8	30	126	34	9	23	19	11	15	30				12	10		10		18	70	1	19	30	80	19	29			15.8		
	6E4131131	P	9	30	126	35	10	28	19	13	15	30				13	10		9		18	71	1	22	31	84.1	20.1	30.1			14.0		
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NON-DESTRUCTIVE TEST

POSITION	PIPE BODY	PIPE END	END SURFACE(GROOVE)	BEVELLING
NDT Type(Level)	EMI/L2	UT/L2		ACCEPTABLE
LAMINAR				VISUAL & DIMENSION
TEST RESULT	ACCEPTABLE	ACCEPTABLE	N/A	ACCEPTABLE
RESIDUAL MAGNETISM	≤20 GS	ACCEPTABLE		COATING
UT THICKNESS MEASUREMENT		N/A		
HYDROSTATIC TEST	Min(psi/s) 2670/6	ACCEPTABLE		

NOTES: H-HEAT ANALYSIS P-PRODUCT ANALYSIS CE-EQUIVALENT CARBON R-RATIO RI=Cu /S  
 CEHW=C+Mn/6+(Cr+Mo+V)/5+(Cu+Ni)/15 CEPCM=C+Si/30+(Mn+Cr+Cu)/20+Ni/60+Mo/15+V/10+S\*B SUM1=C+Cu+Mo+Ni+V SUM2=Nb+V  
 ET-ISO10893-2-2011, UT-ISO10893-10-2011, MPI-ISO10893-5-2011, EMI-ISO10893-3-2011, WT-ISO10893-12-2011, LaminationT-ISO-10893-8-2011  
 LA/L1/L2-ACCEPT LEVEL LA/L3/L2,NOTCH DEPTH IS 12.5% /10% /5% THE SPECIFIED WALL THICKNESS.



HENGYANG VALIN  
STEEL TUBE CO.,LTD

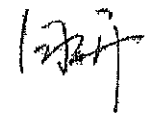

# MILL TEST REPORT


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

(ACCORDING TO EN10204 3.1)

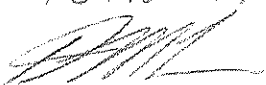
CUSTOMER	TRANS AM			CERTIFICATE NO.	C201516042-1	
CONTRACT NO.	2211002842-1	P. O. NO.	PO.CI-15-327-B (LOT A)	L/C NO.: 5FAHDS-00331	DATE:	2015-5-27 PAGE: 3/3
PRODUCT	SEAMLESS CARBON STEEL PIPE FOR OIL AND GAS USE.			DELIVERY CONDITION	N(HR)	
SPECIFICATION	ASTM A333-6-2013, ASME SA333-6-2013, API 5L X42N PSL-2 45TH EDITION, NACE MR-0175-2011/ISO 15156- 2(REGION 3)-2009 /MR-0103-2012/SS (CSA Z245.1 GRADE 290 CATEGORY II-2014)		HEAT TREATMENT	920°C+10°C/-10°C		
GRADE	GR.6,X42N,GR.290			DIMENSIONS	6**0.280**26FT	
TOTAL BUNDLES:	TOTAL PIECES:		TOTAL LENGTH:		ft	TOTAL WEIGHT: mt
		REMARK : 1.Origin: made in china;2.All elements to be listed; 3.Pipe produced from "fully killed" steel. 4.Silicon and calcium treated for inclusion morphology control in steel melting. 5.Billet produced by: HENGYANG VALIN STEEL TUBE Co.,Ltd				

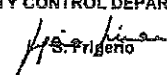

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We hereby certify that material herein described has been manufactured in accordance with the standards and specifications required in your order and satisfies the corresponding requirements.		Quality Manager:   
This certificate is issued by a computerized 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: hsiicc@hysteeltube.com		
CUSTOMER THIRD PARTY		Certificate-maker:

 <b>METALFAR PRODOTTI INDUSTRIALI SPA</b> 23861 CESANA BRIANZA (LC) - ITALY VIA G. PARINI, 28 PHONE + 39 031 655441 - FAX +39 031 655148 certificate@metalfaritaly.com		A01 COMPANY WITH MANAGEMENT SYSTEM CERTIFIED BY DNV = ISO 9001 = = ISO 14001 =																																																									
INSPECTION CERTIFICATE EN 10204:2004 / 3.1		Nr <sup>A03</sup> 2015-C_MFF-04991 Data / Dated 04.12.2015 <sup>Z02</sup>																																																									
TRANS AM PIPING PRODUCTS LTD 9335 ENDEAVOR DRIVE S.E. T3S 0A1 CALGARY, ALBERTA		Ordine / PO CI-15-793 Item 004 DDT / Delivery note 2015-3E301-0004405 Packing List 2015-3E401-0003895 Fattura / Invoice 2015-3E401-0003895 Nr. rif. / Our ref. 2015-3E201-0003267-0004																																																									
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	15/40083	W/N 150 RF 6" STD LF2CL1																																																									
Mat. in acc. a / Mat. in acc. to ASTM/ASME A 350/SA 350 M - 15 ASME CODE SECT. II, PART A, ED. 2013 ASTM A350 LF2 CL1 NACE MR-0175/2009 ISO 15166 - SOUR SERVICE NACE MR-0103/2012 - SOUR SERVICE CSA 2245-T2 GRADE 248 OAT II SOUR SERVICE Q/A S IN ACCORD WITH PRESS. EQUIPM DIRECT. 97/23/EC (PED) ANNEX I PARAGRAPH 4.3. CERT. A687/2014-CE-ITA-ACCREDIA																																																											
<table border="1"> <thead> <tr> <th>Elementi / Elements</th> <th>C</th> <th>Si</th> <th>Mn</th> <th>S</th> <th>P</th> <th>Cr</th> <th>Ni</th> <th>Mo</th> <th>Ti</th> <th>Cu</th> <th>V</th> <th>Nb</th> <th>N</th> </tr> </thead> <tbody> <tr> <td>LADLE ANALYSIS</td> <td>0,190</td> <td>0,230</td> <td>1,070</td> <td>0,010</td> <td>0,012</td> <td>0,090</td> <td>0,050</td> <td>0,010</td> <td>0,015</td> <td>0,013</td> <td>0,002</td> <td>0,001</td> <td>0,009</td> </tr> <tr> <td>LADLE ANALYSIS</td> <td>Al</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>CE LF</td> <td>CE SF</td> <td>F1</td> <td>F2</td> <td>PREN</td> </tr> <tr> <td></td> <td>0,025</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>0,393</td> <td>0,368</td> <td>0,165</td> <td>0,100</td> <td>--</td> </tr> </tbody> </table>				Elementi / Elements	C	Si	Mn	S	P	Cr	Ni	Mo	Ti	Cu	V	Nb	N	LADLE ANALYSIS	0,190	0,230	1,070	0,010	0,012	0,090	0,050	0,010	0,015	0,013	0,002	0,001	0,009	LADLE ANALYSIS	Al								CE LF	CE SF	F1	F2	PREN		0,025								0,393	0,368	0,165	0,100	--
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Sez/Spec. mm <sup>2</sup>	L. mm	MPa	MPa	MPa	%	%																																																					
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<table border="1"> <thead> <tr> <th>DUREZZA / HARDNESS</th> <th colspan="6">RESILIENZA / IMPACT TEST</th> </tr> <tr> <th>HBW</th> <th>Tipo/Type</th> <th>Provetta / Test Specimen</th> <th>°C</th> <th>1-Joule</th> <th>2-Joule</th> <th>3-Joule</th> <th>Media/Average</th> </tr> <tr> <th>KV</th> <th></th> <th>10x10 mm</th> <th></th> <th>78</th> <th>70</th> <th>73</th> <th>73,7</th> </tr> </thead> <tbody> <tr> <td>152,0 - 158,0</td> <td></td> <td></td> <td>-46</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>				DUREZZA / HARDNESS	RESILIENZA / IMPACT TEST						HBW	Tipo/Type	Provetta / Test Specimen	°C	1-Joule	2-Joule	3-Joule	Media/Average	KV		10x10 mm		78	70	73	73,7	152,0 - 158,0			-46																													
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152,0 - 158,0			-46																																																								
Tratt. Term. / Heat treatment: NORMALIZED AT 930° C - COOLED IN STILL AIR / ELECTRIC FURNACE																																																											
Dim in acc. a / Dim. acc. to: ASME/ANSI B16.5-2013 / ASME/ANSI B36.10M-2015																																																											
Finitura / Roughness: 125/250 MICRORINCH AARH																																																											
Marcatura in acc. Marking in acc. to	MSS SP25 Ed. 2013	Vis. & Dim.	Satisfactory																																																								
			Origine Origin of Steel																																																								
			EUROPEAN UNION																																																								

Note / Notes  
 100% MANUFACTURED IN ITALY  
 MANUFACTURING IN ACCORDANCE WITH ORDER AND SPECIFICATION

*CFB-12*  
*6 NPS Std. 150H*  
*SA 350 Gr. LF2 Cl. 1*  
*Heat No. 15/40083*  
*PO: 161744*  


UFFICIO CONTROLLO QUALITA' QUALITY CONTROL DEPARTMENT 	ENTE UFFICIALE DI COLLAUDO INSPECTION AUTHORITY	MARCHIO PRODUZIONE MANUFACTURER'S SYMBOL 
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## QW-483 PROCEDURE QUALIFICATION RECORD (PQR)

Company Name EnVision Manufacturing & Supply Ltd.  
Procedure Qualification Record No. ENV-1-2 (Rev. 0) Date January 28, 2016  
Welding Process(es) Shielded Metal Arc Welding (SMAW)

### JOINTS (QW-402)

Joint Design Butt joint, single vee groove, see next page  
Root Opening See next page  
Backing Without Retainers Without

### BASE METALS (QW-403)

Material Specification No. SA 516 Type or Grade Gr. 60/70  
P-No. P1 Groups 1/2 To P-No. P1 Groups 1/2 Thickness 0.500 in.  
Heat Number 390319 - 97657-01 Carbon Equivalent (1) 0.395  
Diameter N/A Other Plate product form  
Deposited Weld Metal (Per Pass) Did not exceed 0.094 in. for E6010,  
and 0.125 in. for E7018-1

(1) Per CSA Z662 Carbon Equivalent formula. See chemical composition of heat analysis on attached material test report.

### FILLER METALS (QW-404)

	SMAW	SMAW
Specification No. (SFA)	<u>SFA 5.1</u>	<u>SFA 5.1</u>
AWS No. (Class)	<u>E6010 (2)</u>	<u>E7018-1 (3)</u>
F-No.	<u>F3</u>	<u>F4</u>
A-No.	<u>A1</u>	<u>A1</u>
Diameter	<u>See attached sketch</u>	
Deposited Weld Metal Thickness	<u>0.094 in.</u>	<u>0.406 in.</u>

(2) The Lincoln Electric Company: Fleetweld 5P+

(3) ESAB: OK 55.00

### POSITION (QW-405)

Position of Groove 3G Weld Progression Vertical up

### PREHEAT (QW-406)

Preheat Temperature 60 °F Interpass Temp. (Max.) 400 °F  
Preheat Maintenance Weld was allowed to cool to ambient temperature in still air after welding was completed.

### POSTWELD HEAT TREATMENT (QW-407)

With or Without Without  
Temperature N/A Time N/A

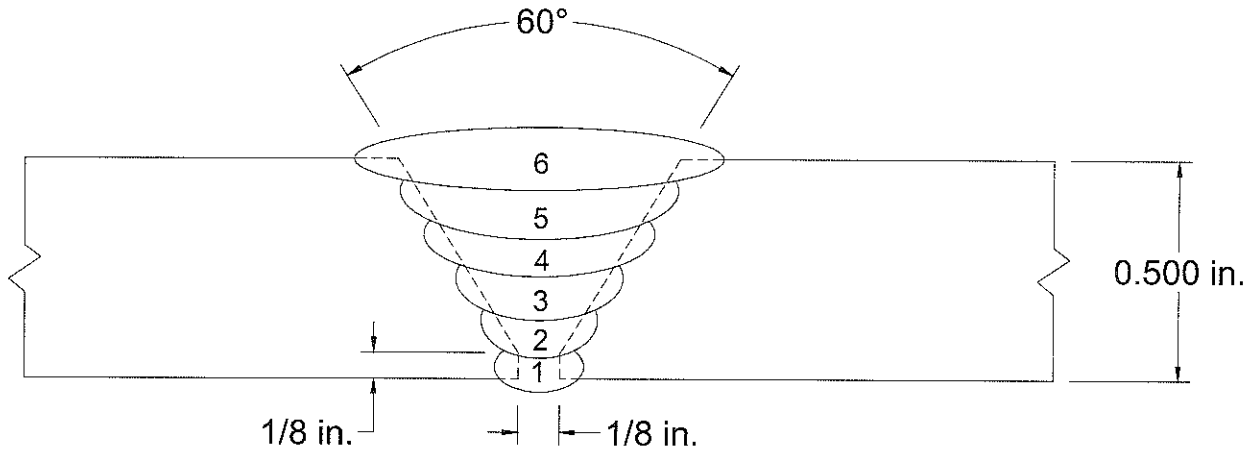


**ELECTRICAL CHARACTERISTICS (QW-409)**

Current	<u>Direct</u>	Polarity	<u>Reverse, electrode positive</u>
Amps	<u>See below</u>	Volts	<u>See below</u>
Heat Input	<u>E6010: 36,290 J/in. maximum</u>		<u>E7018-1: 71,400 J/in. maximum</u>

**TECHNIQUE (QW-410)**

Manual or Automatic	<u>Manual</u>	
Multiple or Single Pass Per Side	<u>E6010: Single</u>	<u>E7018-1: Multiple</u>
String or Weave	<u>E6010: String</u>	<u>E7018-1: String and Weave</u>
Travel Speed	<u>See below</u>	
Initial & Interpass Cleaning	<u>Brushing, chipping and grinding as required</u>	
Method of Back Gouging	<u>Not conducted</u>	
Peening	<u>Not conducted</u>	
Use of Thermal Process	<u>N/A</u>	



Pass	Process	Filler Metal	Diameter in.	Current Type & Polarity	Amperage Range	Voltage Range	Travel Speed i.p.m.
1	SMAW	E6010	1/8	DCRP	70 - 80	23 - 27	3.1
2	SMAW	E7018-1	3/32	DCRP	80 - 90	20 - 24	9.7
3	SMAW	E7018-1	3/32	DCRP	80 - 90	20 - 24	5.1
4	SMAW	E7018-1	3/32	DCRP	80 - 90	19 - 23	3.2
5	SMAW	E7018-1	3/32	DCRP	80 - 90	19 - 23	2.8
6	SMAW	E7018-1	3/32	DCRP	80 - 90	19 - 23	1.5

**TENSILE TEST (QW-150)**

Sample No.	Width in.	Thickness in.	Area sq. in.	Ultimate Load lbf	Ultimate Stress psi	Fracture Type & Location
T1	0.752	0.421	0.317	24,400	76,900	Partial Cup & Cone Parent Metal
T2	0.752	0.425	0.320	24,600	76,800	Partial Cup & Cone Parent Metal

**GUIDED BEND TEST (QW-160)**

Type & Figure No.	Result	Type & Figure No.	Result
QW-462.2, TSB - S1	Pass	QW-462.2, TSB - S3	Pass
QW-462.2, TSB - S2	Pass	QW-462.2, TSB - S4	Pass

**CHARPY V-NOTCH IMPACT TEST**

Type of Test Charpy V-Notch Orientation Transverse  
 Test Temperature -50 °F Specimen Size 0.394 X 0.394 in.

Specimen Number	Notch Location	Impact Values ft-lbf
F2.1	Weld Metal	62
F2.2	within 1/16 in.	46
F2.3	of root	71
F3.1	HAZ	154
F3.2	1/4 - 1/2t from	115
F3.3	cap surface	167

**OTHER TESTS**

Vickers Hardness - see attached Laboratory Test Report No.: C16-071.2

Welders Name Alain Lacusta Certificate File No. W-18527  
 Tests Conducted By SGS Canada Inc.  
 Laboratory Test No. C16-071.2

We certify the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Code.

Manufacturer EnVision Manufacturing & Supply Ltd.

Date Feb 23, 2016 Signed Pashanoy



TENSILE / BEND TEST

Customer: EnVision Manufacturing & Supply Ltd.
PO Box 5424
Lacombe, AB
T4L 1X1

Laboratory Test No.: C16-071.2
Date: February 2, 2016

Attention: Tasha McDonald

Table with 2 columns: Property and Value. Rows include PQR No., Material, Thickness, Thermal Condition, and Heat No.

Governing Spec.: ASME Section IX - 2015

Instrument: Satec S/N: 1127

Table with 3 columns: Property, T1, T2. Rows include SAMPLE NO., WIDTH, THICKNESS, AREA, ULTIMATE LOAD, ULTIMATE STRESS, FRACTURE TYPE, and FRACTURE LOCATION.

Note: Imperial values calculated by direct conversion.

Table with 5 columns: Property, Side Bend, Side Bend, Side Bend, Side Bend. Rows include SAMPLE TYPE, SAMPLE NO., and RESULTS.

Test Conducted By: Oksana Shevchenko, C.E.T. / Timothy Colpitts, T.T., I.W.T. (Calgary)

Certified By: [Signature] L-A-B Accredited Certificate Number L2057-1 Testing
Eric Dacyk, C.E.T.

This report (or certificate) is issued by the Company under its General Conditions for Inspection and Testing Services (copy available upon request). The issuance of this report (or certificate) does not exonerate buyers or sellers from exercising all their rights and discharging all their liabilities under the Contract of Sale.



### CHARPY V-NOTCH IMPACT TEST

**Customer:** EnVision Manufacturing & Supply Ltd.  
PO Box 5424  
Lacombe, AB  
T4L 1X1

**Laboratory Test No.:** C16-071.2  
**Date:** February 1, 2016

**Attention:** Tasha McDonald

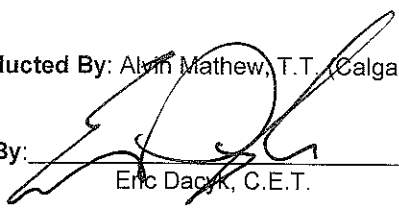
<b>PQR No.:</b>	ENV-1-2 (Rev. 0)	<b>Heat No.:</b>	390319 - 97657-01
<b>Material:</b>	SA 516 Gr. 60/70		
<b>Thickness:</b>	12.7 mm (0.500 in.)		
<b>Thermal Condition:</b>	As Welded		

<b>Specimen Size:</b>	10 x 10 mm (0.394 x 0.394 in.)	<b>Instrument:</b>	Satec, SI-1C SN:1363
<b>Orientation:</b>	Transverse	<b>Capacity:</b>	325 J (240 ft-lbf)
<b>Test Temperature:</b>	-46 °C (-50 °F)	<b>Verified Range:</b>	1.7 - 260 J (1.3 - 192 ft-lbf)
<b>Governing Spec.:</b>	ASME Section VIII, Div. I, UG-84 – 2015		

Specimen Number	Notch Location	Impact Values	
		Joules	(ft-lbf)
F2.1	Weld Metal within 1.5mm (1/16") of root	84	(62)
F2.2		62	(46)
F2.3		96	(71)
F3.1	HAZ 1/4-1/2t from cap surface	209	(154)
F3.2		156	(115)
F3.3		226	(167)

*Note: Metric values calculated by direct conversion.*

**Test Conducted By:** Alvin Mathew, T.T. (Calgary)

**Certified By:**  L-A-B Accredited Certificate Number L2057-1 Testing  
Eric Dacyk, C.E.T.

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QM-System: Certification as per ISO 9001



DILLINGER HÜTTE

Erklärungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004 INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1993+AM:1995 + AS PER ISO 10474:2013 MATERIAL TEST REPORT (MTR)		A10 Advice of dispatch No./ Date of dispatch 476277-04.12.13	A08/Manufacturer's order/ A03 Certificate No. 388957-001	Sheet 1/...
A05 Establishing/inspecting body DH	A06 Purchaser EDMONTON STEEL, EDMON Final receiver EDMONTON STEEL, EDMON	A07.1 No. ED10628-J1010-ER	A07.2 No.	B01 Product HEAVY PLATES
B02 Steel design. SA516-60	SA20-S5		<p>18455</p>	
B03 Any suppl. requirements	ASME-III A:2010+ADDENDA-2011A DIL-HUE-1:R30-2012-10-01			

B01-B99 Description of the product

B14 Item No.	B08 Number of pieces	B09 Thickness	B10 Width	B11 Length	B12 Theoretical mass KG	B04 Product delivery condition	B07.2 Heat-No.	B07.1 Rolled plate No./ Test No.	A09 Purchaser article number
			INCH						
01	1	0,5000 x	96,50000 x	480,00000	2979	N	390316	33238-01	
01	1	0,5000 x	96,50000 x	480,00000	2979	N	390316	33238-02	
01	1	0,5000 x	96,50000 x	480,00000	2979	N	390316	34322-01	
01	1	0,5000 x	96,50000 x	480,00000	2979	N	390316	34322-02	
01	1	0,5000 x	96,50000 x	480,00000	2979	N	390318	97911-02	
01	1	0,5000 x	96,50000 x	480,00000	2979	N	390318	97911-03	
01	1	0,5000 x	96,50000 x	480,00000	2979	N	390318	97912-02	
01	1	0,5000 x	96,50000 x	480,00000	2979	N	390319	97855-01	
**	8				23832				
02	1	0,5000 x	120,50000 x	480,00000	3720	N	390319	97654-01	
02	1	0,5000 x	120,50000 x	480,00000	3720	N	390319	97654-02	
02	1	0,5000 x	120,50000 x	480,00000	3720	N	390319	97654-03	
*02	1	0,5000 x	120,50000 x	480,00000	3720	N	390319	97657-01*	
02	1	0,5000 x	120,50000 x	480,00000	3720	N	390319	97657-02	
02	1	0,5000 x	120,50000 x	480,00000	3720	N	390319	97659-01	
02	1	0,5000 x	120,50000 x	480,00000	3720	N	390319	97659-02	
02	1	0,5000 x	120,50000 x	480,00000	3720	N	390319	97659-03	
02	1	0,5000 x	120,50000 x	480,00000	3720	N	390319	97852-01	
02	1	0,5000 x	120,50000 x	480,00000	3720	N	390319	97852-02	
**	10				37200				
***	18				61032				

CPL-194  
SA 516 Gr. 60  
0.500 in.  
Heat No.: 390319 - 97657-01  
Rec'd On: December 8, 2015  
P.O. No.: 160365 (Int. Reg. C1397)

A04 Manufacturer's mark	Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.	B. BALDAUF Test House Manager	AHB Inspector's stamp	AG der Dillinger Hüttenwerke Postfach 1580, D-66748 Dillingen/Saar inspection department	A01
			Date: 04.12.13	PP 1	

QM-System: Certification as per ISO 9001



DILLINGER HÜTTE

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B02/ Steel design. SA516-60	SA20-S5			
B03 Any suppl. requirements	ASME-IIA:2010+ADDENDA-2011A DIL-HUE-1:R30-2012-10-01			

B04 Product delivery condition

ITEM NO.: 01-02  
 N: HT: 1670 GR.F +36 -27 GR.F  
 SOAKING TIME TO ATTAIN THE TARGET TEMPERATURE OVER THE WHOLE SECTION: 1-1,75 MIN/MM (25-45 MIN/INCH)  
 COOLING IN STILL AIR

B06 Marking of the product

ITEM NO.: 01-02  
 STEEL DESIGNATION SA516 70 MTLTV SA516 60 MTLTV  
 HEAT NO. / TRADEMARK / ROLLED PLATE NO.-TEST NO. / INSPECTOR'S STAMP

B07-B99 Further information about the product

ITEM NO.: 01-02  
 THICKNESS REDUCTION RATIO  $\geq 3,0$  IS FULFILLED (CF. A/SA20 PAR. 5.3)

C10-C29 Tensile test

B14 Item No.	B07.2 Heat No.	B07.1 Rol./plate/ Test No.	B05 Reference (heat) treatment	C01 C01	C02 Temp. GR.F	C03 KSI RP02	C10 C11	C12 RM	C13 A % L0=8IN	C14-C15
01	390316	33238		K1	Q	RT	51,3	74,5	29	
01	390316	34322		K1	Q	RT	51,0	74,2	26	
01	390318	97911		K1	Q	RT	51,5	75,4	27	
01	390318	97912		K1	Q	RT	50,8	75,1	26	
01	390319	97855		K1	Q	RT	52,5	76,1	24	
02	390319	97654		K1	Q	RT	52,8	75,5	27	
02	390319	97657		K1	Q	RT	52,3	75,1	29	
02	390319	97659		K1	Q	RT	52,6	75,8	28	
02	390319	97852		K1	Q	RT	51,2	75,4	29	

A04	201/202/203 We hereby certify, that the above-mentioned materials have been delivered in accordance with the terms of order.			AG der Dillinger Hüttenwerke Postfach 1580, D-66748 Dillingen/Saar Inspection department:	A01
		B. BALDAUF Test House Manager	Inspector's stamp	Date: 04.12.13	PP 1

QM-System: Certification as per ISO 9001



DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificat)

A02: INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004 INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:2013 MATERIAL TEST REPORT (MTR)		A10 Advice of dispatch No./ Date of dispatch 476277-04...12...13	A08/ Manufacturer's order/ A03 Certificate No.: 388957-001	Sheet 3/...
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B02 Steel design. SA516-60	SA20-S5			
B03 Any suppl. requirements	ASME-III:2010+ADDENDA-2011A DIL-HUE-1:R30-2012-10-01			

C30-C39 Hardness test

B14 Item No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.	B05 Reference (heat) treatment	C01	C02/C01	C03 Temp. GR.F	C30 Method of test	C35	C31 Individual values	C32 Mean value
01	390316	33238		K1	O		RT HBW 10/3000	HB 142	143 142	142
01	390316	34322		K1	O		RT HBW 10/3000	HB 140	141 141	141
01	390318	97911		K1	O		RT HBW 10/3000	HB 142	143 144	143
01	390318	97912		K1	O		RT HBW 10/3000	HB 142	142 142	142
01	390319	97855		K1	O		RT HBW 10/3000	HB 146	144 144	145
02	390319	97654		K1	O		RT HBW 10/3000	HB 143	143 141	142
02	390319	97657		K1	O		RT HBW 10/3000	HB 144	144 144	144
02	390319	97659		K1	O		RT HBW 10/3000	HB 145	145 145	145
02	390319	97852		K1	O		RT HBW 10/3000	HB 145	146 146	146

C40-C49 Impact test

B14 Item No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.	B05 Reference (heat) treatment	C01	C02/C01	C03 Temp. GR.F	C41 Width of test piece	C40 Type of test piece	C44 Testing method	C46 Energy	C45	C42 Individual values AV=FT.LBF	C43 Mean value
01	390316	33238		K1	LV	-51		CHP-V		AV 8	223	220 174	206
01	390316	34322		K1	LV	-51		CHP-V		AV 8	212	235 211	219
01	390318	97911		K1	LV	-51		CHP-V		AV 8	140	207 184	177
01	390318	97912		K1	LV	-51		CHP-V		AV 8	145	150 213	169
01	390319	97855		K1	LV	-51		CHP-V		AV 8	163	107 127	132
02	390319	97654		K1	LV	-51		CHP-V		AV 8	203	193 231	209
02	390319	97657		K1	LV	-51		CHP-V		AV 8	193	195 203	197
02	390319	97659		K1	LV	-51		CHP-V		AV 8	148	114 124	129
02	390319	97852		K1	LV	-51		CHP-V		AV 8	209	195 151	185

A04: Z01/Z02/Z03 We hereby certify, that the above-mentioned materials have been delivered in accordance with the terms of order.



*B. Baldauf*



AG der Dillinger Hüttenwerke  
Postfach 1580, D-66748 Dillingen/Saar  
Inspection department

B. BALDAUF  
Test House Manager

Inspector's stamp

Date 04.12.13

pp 1

QM-System: Certification as per ISO 9001



DILLINGER HÜTTE

Eräuterungen: siehe Rückseite / Explications voir au verso / See reverse for explanations (www.dillinger.de/certificate)

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B02 Steel design. SA516-60	SA20-S5			
B03 Any suppl. requirements	ASME-IIA:2010+ADDENDA-2011A DIL-HUE-1:R30-2012-10-01			

C70-C99 Chemical composition % - Heat analysis

B07.2 Heat	C70	C	SI	MN	P	S	N	CU	MO	NI	CR	V	NB	SN	TI
390316	Y	0,157	0,380	1,18	0,009	0,0007	0,0085	0,040	0,018	0,046	0,030	0,000	0,000	0,001	0,002
390318	Y	0,174	0,381	1,20	0,007	0,0008	0,0072	0,024	0,012	0,040	0,039	0,000	0,000	0,001	0,002
390319	Y	0,176	0,381	1,19	0,008	0,0006	0,0070	0,038	0,010	0,049	0,033	0,000	0,001	0,000	0,002

B07.2 Heat	C70	B	CA	AL-T
390316	Y	0,0000	0,0019	0,032
390318	Y	0,0000	0,0014	0,035
390319	Y	0,0000	0,0012	0,032

C94 Heat analysis Carbon equivalent / Alloying restrictions


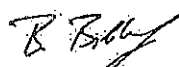

B07.2 Heat	FO-02=	FO-51=	FO-55=	FO-78=	FO-91=
390316	0,37	0,000	0,13	0,05	7,5
390318	0,39	0,000	0,12	0,05	6,9
390319	0,39	0,001	0,13	0,04	6,8

C95 Ladle treatment

ITEM NO.: 01-02  
HEAT OF THE INDICATED ITEM: VACUUM DEGASSED / SULPHIDE SHAPE CONTROL

C95 Further information about ladle treatment

ITEM NO.: 01-02  
CALCIUM TREATED

A04  Manufacturer's mark	Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.	 B. BALDAUF Test House Manager	 Inspector's stamp	AG der Dillinger Hüttenwerke Postfach 1580, D-66748 Dillingen/Saar Inspection department	A01
Date 04.12.13			PP	1	



QM-System: Certification as per ISO 9001



DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate).

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004 INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:2013. MATERIAL TEST REPORT (MTR)		A10 Advice of dispatch No./ Date of dispatch 476277-04.12.13	A08/ Manufacturer's order/ A03 Certificate No.: 388957-001	Sheet 5/...
A05 Established inspecting body DH	A06 Purchaser EDMONTON STEEL, EDMON Final receiver EDMONTON STEEL, EDMON	A07.1 No. ED10628-J1010-ER A07.2 No.	B01 Product HEAVY PLATES	
B02 Steel design: SA516-60	SA20-S5			
B03 Any suppl. requirements	ASME-IIA:2010+ADDENDA-2011A DIL-HUE-1:R30-2012-10-01			

C70-C99 Chemical composition % - Product analysis

B07.2 Heat	B07.1 Test No.	C01	C	SI	MN	P	S	N	CU	MO	NI	CR	V	NB	SN	TI
390316	34322	K1	0,155	0,376	1,18	0,009	0,0008	0,0065	0,038	0,018	0,045	0,028	0,000	0,000	0,001	0,002
390318	97914	K1	0,170	0,375	1,18	0,006	0,0007	0,0067	0,022	0,012	0,041	0,038	0,000	0,000	0,001	0,001
390319	97714	K1	0,173	0,378	1,18	0,006	0,0008	0,0074	0,022	0,012	0,040	0,038	0,000	0,000	0,001	0,001

B07.2 Heat	B07.1 Test No.	C01	B	CA	AL-T
390316	34322	K1	0,0001	0,0017	0,033
390318	97914	K1	0,0000	0,0015	0,033
390319	97714	K1	0,0000	0,0013	0,034

C94 Product analysis Carbon equivalent / Alloying restrictions

B07.2 Heat	B07.1 Test No.	C01	FO-02=	FO-51=	FO-55=
390316	34322	K1	0,37	0,000	0,13
390318	97914	K1	0,38	0,000	0,11
390319	97714	K1	0,38	0,000	0,11

C94 Carbon equivalent formula / Alloying restrictions

FO-02 = C + (MN/6) + (CR+MO+V) / 5 + (NI+CU) / 15  
 FO-51 = V + NB  
 FO-55 = CU+MO+NI+CR  
 FO-78 = CR+MO  
 FO-91 = MN/C

A04	Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.			AG der Dillinger Hüttenwerke Postfach 1580, D-66748 Dillingen/Saar Inspection department.	A01
		B. BALDAUF Test House Manager	Inspector's stamp	Date: 04.12.13	PP 1

QM-System: Certification as per ISO 9001



DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/See reverse for explanations (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004 INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:2013 MATERIAL TEST REPORT (MTR)		A10 Advice of dispatch No./ Date of dispatch  476277-04.12.13	A08/ Manufacturer's order/ A03 Certificate No.  388957-001	Sheet  6
A05 Established inspecting body DH	A06 Purchaser EDMONTON STEEL, EDMON Final receiver EDMONTON STEEL, EDMON	A07.1 No. ED10628-J1010-ER A07.2 No.	B01 Product HEAVY PLATES	
B02/ Steel design. SA516-60	SA20-S5			
B03 Any suppl. requirements	ASME-IIA:2010+ADDENDA-2011A DIL-HUE-1:R30-2012-10-01			

D01 Marking and identification, surface appearance, shape and dimensional properties

ITEM NO.: 01-02  
 EXAMINATION OF MARKING, SURFACE, SHAPE AND DIMENSIONS: THE RESULTS MEET THE REQUIREMENTS.  
 SURFACE AS PER ASME-SA20  
 THICKNESS AS PER ASME-SA20  
 LENGTH AND WIDTH AS PER ASME-SA20  
 FLATNESS AS PER 1/2-ASME-SA20



A04	Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.			AG der Dillinger Hüttenwerke Postfach 1580, D-66748 Dillingen/Saar Inspection department	A01
		B. BALDAUF Test House Manager	Inspector's stamp	Date 04.12.13	PP 1

QM-System; Certification as per ISO 9001



DILLINGER HÜTTE

Erläuterungen siehe Rückseite/Explications voir au verso/Sae reverse for explanations (www.dillinger.de/certificate)

A02 INSPECTION CERTIFICATE 3.1. AS PER EN 10204:2004 INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:2013 MATERIAL TEST REPORT (MTR)		A10: Advice of dispatching/ Date of dispatch: 476277-04.12.13	A08: Manufacturer's order/ A03: Certificate No. 388957-001	Sheet 1/...
A05: Established inspecting body DH	A06 Purchaser EDMONTON STEEL, EDMON Final receiver EDMONTON STEEL, EDMON	A07.1 No. ED10628-J1010-ER A07.2 No.	B01 Product HEAVY PLATES	
B02/ Steel design. SA516-70	SA20-S5		<p>18454</p>	
B03 Any suppl. requirements ASME-IIA:2010+ADDENDA-2011A DIL-HUE-1:R30-2012-10-01				

B01-B99 Description of the product

B14 Item No.	B08 Number of pieces	B09 Thickness	B10 Width	B11 Length	B12 Theoretical mass KG	B04 Product delivery condition	B07.2 Heat No.	B07.1 Rolled plate No./ Test No.	A09 Purchaser article number
INCH									
01	1	0,5000 x	96,50000 x	480,00000	2979	N	390316	33238-01	
01	1	0,5000 x	96,50000 x	480,00000	2979	N	390316	33238-02	
01	1	0,5000 x	96,50000 x	480,00000	2979	N	390316	34322-01	
01	1	0,5000 x	96,50000 x	480,00000	2979	N	390316	34322-02	
01	1	0,5000 x	96,50000 x	480,00000	2979	N	390318	97911-02	
01	1	0,5000 x	96,50000 x	480,00000	2979	N	390318	97911-03	
01	1	0,5000 x	96,50000 x	480,00000	2979	N	390318	97912-02	
01	1	0,5000 x	96,50000 x	480,00000	2979	N	390319	97855-01	
**	8				23832				
02	1	0,5000 x	120,50000 x	480,00000	3720	N	390319	97654-01	
02	1	0,5000 x	120,50000 x	480,00000	3720	N	390319	97654-02	
02	1	0,5000 x	120,50000 x	480,00000	3720	N	390319	97654-03	
* 02	1	0,5000 x	120,50000 x	480,00000	3720	N	390319	97657-01	
02	1	0,5000 x	120,50000 x	480,00000	3720	N	390319	97657-02	
02	1	0,5000 x	120,50000 x	480,00000	3720	N	390319	97659-01	
02	1	0,5000 x	120,50000 x	480,00000	3720	N	390319	97659-02	
02	1	0,5000 x	120,50000 x	480,00000	3720	N	390319	97659-03	
02	1	0,5000 x	120,50000 x	480,00000	3720	N	390319	97852-01	
02	1	0,5000 x	120,50000 x	480,00000	3720	N	390319	97852-02	
**	10				37200				
***	18				61032				

CPL-194  
SA516 Gr. 70  
0.500in.  
Heat No.: 390319-97657-01  
Rec'd On: December 8, 2015  
P.O. No.: 160365 (Int. Reg. C1397)

A04	Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.				AG der Dillinger Hüttenwerke Postfach 1580, D-66748 Dillingen/Saar Inspection department	A01
		B. BALDAUF Test House Manager		Inspector's stamp Date 04.12.13		PP 1

QM-System: Certification as per ISO:9001



DILLINGER HÜTTE

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A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004 INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:2013 MATERIAL TEST REPORT (MTR)		A10 Advice of dispatch No./ Date of dispatch 476277-04.12.13	A08/ Manufacturer's order/ A03 Certificate No. 388957-001	Sheet 2/...
A05 Established inspecting body DH	A06 Purchaser EDMONTON STEEL, EDMON Final receiver EDMONTON STEEL, EDMON	A07.1 No. ED10628-J1010-ER A07.2 No.	B01 Product HEAVY PLATES	
B02/ Steel design. SA516-70	SA20-S5			
B03 Any suppl. requirements	ASME-IIA:2010+ADDENDA-2011A DIL-HUE-1:R30-2012-10-01			

**B04 Product delivery condition**

ITEM NO.: 01-02  
N: HT: 1670 GR.F +36 -27 GR.F  
SOAKING TIME TO ATTAIN THE TARGET TEMPERATURE OVER THE WHOLE SECTION: 1-1,75 MIN/MM (25-45 MIN/INCH)  
COOLING IN STILL AIR

**B06 Marking of the product**


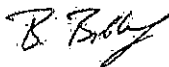

ITEM NO.: 01-02  
STEEL DESIGNATION SA516 70 MTLV SA516 60 MTLV  
HEAT NO. / TRADEMARK / ROLLED PLATE NO.-TEST NO. / INSPECTOR'S STAMP

**B07-B99 Further information about the product**

ITEM NO.: 01-02  
THICKNESS REDUCTION RATIO  $\geq 3,0$  IS FULFILLED (CF. A/SA20 PAR. 5.3)

**C10-C29 Tensile test**

B14 Item No.	B07.2 Heat No.	B07.1 Rol.plate/ Test No.	B05 Reference (heat) treatment	C01 C01	C02 C02	C03 C03 Temp. GR:F	C10 C10 KSI RP02	C11 C11	C12 C12 RM	C13 C13	A % L0=81N	C14-C15
01	390316	33238		K1 Q		RT	51,3		74,5		29	
01	390316	34322		K1 Q		RT	51,0		74,2		26	
01	390318	97911		K1 Q		RT	51,5		75,4		27	
01	390318	97912		K1 Q		RT	50,8		75,1		26	
01	390319	97855		K1 Q		RT	52,5		76,1		24	
02	390319	97654		K1 Q		RT	52,8		75,5		27	
02	390319	97657		K1 Q		RT	52,3		75,1		29	
02	390319	97659		K1 Q		RT	52,6		75,8		28	
02	390319	97852		K1 Q		RT	51,2		75,4		29	

A04  Manufacturer's mark	Z01/Z02/Z03: We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.	 B. BALDAUF Test House Manager	 Inspector's stamp	AG der Dillinger Hüttenwerke Postfach 1580, D-66748 Dillingen/Saar Inspection department	A01
		Date: 04.12.13	PP	1	

QM-System: Certification as per ISO 9001.



DILLINGER HÜTTE

Erläuterungen: siehe Rückseite/Explications: voir au verso/See reverse for explanations (www.dillinger.de/certificate)


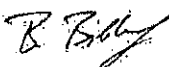

A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004 INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:2013 MATERIAL TEST REPORT (MTR)		A10 Advice of dispatch No./ Date of dispatch 476277-04.12.13	A08/Manufacturer's order/ A03 Certificate No. 388957-001	Sheet 3/...
A05 Established inspecting body DH	A06 Purchaser EDMONTON STEEL, EDMON Final receiver EDMONTON STEEL, EDMON	A07.1 No. ED10628-J1010-ER	B01 Product HEAVY PLATES	
B02/ Steel design. SA516-70	SA20-S5			
B03 Any suppl. requirements	ASME-III:2010+ADDENDA-2011A DIL-HUE-1:R30-2012-10-01			

C30-C39 Hardness test

B14 Item No.	B07.2 Heat No.	B07.1 Rol. plate/ Test No.	B05 Reference (heat) treatment	C01	C02/C01	C03 Temp. GR.F	C30 Method of test.	C35	C31 Individual values	C32 Mean value
01	390316	33238		K1	O	RT	HBW 10/3000	HB 142	143 142	142
01	390316	34322		K1	O	RT	HBW 10/3000	HB 140	141 141	141
01	390318	97911		K1	O	RT	HBW 10/3000	HB 142	143 144	143
01	390318	97912		K1	O	RT	HBW 10/3000	HB 142	142 142	142
01	390319	97855		K1	O	RT	HBW 10/3000	HB 146	144 144	145
02	390319	97654		K1	O	RT	HBW 10/3000	HB 143	143 141	142
02	390319	97657		K1	O	RT	HBW 10/3000	HB 144	144 144	144
02	390319	97659		K1	O	RT	HBW 10/3000	HB 145	145 145	145
02	390319	97852		K1	O	RT	HBW 10/3000	HB 145	146 146	146

C40-C49 Impact test

B14 Item No.	B07.2 Heat No.	B07.1 Rol. plate/ Test No.	B05 Reference (heat) treatment	C01	C02/ C01	C03 Temp. GR.F	C41 Width of test piece.	C40 Type of test piece	C44 Testing method	C46 Energy	C45	C42 Individual values AV=FT.LBF	C43 Mean value
01	390316	33238		K1	LV	-51		CHP-V		AV 8	223	220 174	206
01	390316	34322		K1	LV	-51		CHP-V		AV 8	212	235 211	219
01	390318	97911		K1	LV	-51		CHP-V		AV 8	140	207 184	177
01	390318	97912		K1	LV	-51		CHP-V		AV 8	145	150 213	169
01	390319	97855		K1	LV	-51		CHP-V		AV 8	163	107 127	132
02	390319	97654		K1	LV	-51		CHP-V		AV 8	203	193 231	209
02	390319	97657		K1	LV	-51		CHP-V		AV 8	193	195 203	197
02	390319	97659		K1	LV	-51		CHP-V		AV 8	148	114 124	129
02	390319	97852		K1	LV	-51		CHP-V		AV 8	209	195 151	185

A04	 <p>Manufacturer's mark</p>	<p>Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.</p>	 <p>B. BALDAUF Test House Manager</p>	 <p>Inspector's stamp</p>	<p>AG der Dillinger Hüttenwerke Postfach 1580, D-66748 Dillingen/Saar Inspection department.</p>	A01
		Date: 04.12.13			pp 1	

QM-System: Certification as per ISO 9001



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A05 Established inspecting body DH	A06 Purchaser: EDMONTON STEEL, EDMON Final receiver: EDMONTON STEEL, EDMON	A07.1 No. ED10628-J1010-ER A07.2 No.	B01 Product HEAVY PLATES	
B02 Steel design: SA516-70	SA20-S5			
B03 Any suppl. requirements	ASME-IIA:2010+ADDENDA-2011A DIL-HUE-1:R30-2012-10-01			

C70-C99 Chemical composition % - Heat analysis

B07.2 Heat	C70	C	SI	MN	P	S	N	CU	MO	NI	CR	V	NB	SN	TI
390316	Y	0,157	0,380	1,18	0,009	0,0007	0,0085	0,040	0,018	0,046	0,030	0,000	0,000	0,001	0,002
390318	Y	0,174	0,381	1,20	0,007	0,0008	0,0072	0,024	0,012	0,040	0,039	0,000	0,000	0,001	0,002
390319	Y	0,176	0,381	1,19	0,008	0,0006	0,0070	0,038	0,010	0,049	0,033	0,000	0,001	0,000	0,002

B07.2 Heat	C70	B	CA	AL-T
390316	Y	0,0000	0,0019	0,032
390318	Y	0,0000	0,0014	0,035
390319	Y	0,0000	0,0012	0,032

C94 Heat analysis Carbon equivalent / Alloying restrictions

B07.2 Heat	FO-02=	FO-51=	FO-55=	FO-78=	FO-91=
390316	0,37	0,000	0,13	0,05	7,5
390318	0,39	0,000	0,12	0,05	6,9
390319	0,39	0,001	0,13	0,04	6,8

C95 Ladle treatment

ITEM NO.: 01-02  
HEAT OF THE INDICATED ITEM: VACUUM DEGASSED / SULPHIDE SHAPE CONTROL

C95 Further information about ladle treatment

ITEM NO.: 01-02  
CALCIUM TREATED

A04  Manufacturers mark	Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.	 B. BALDAUF Test House Manager	 Inspector's stamp	AG der Dillinger Hüttenwerke Postfach 1580, D-66748 Dillingen/Saar Inspection department	A01
		Date 04.12.13	PP	I	

QM-System: Certification as per ISO 9001



DILLINGER HÜTTE

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B02 Steel design. SA516-70	SA20-85			
B03 Any suppl. requirements	ASME-III:2010+ADDENDA-2011A DIL-HUE-1:R30-2012-10-01			

C70-C99 Chemical composition % - Product analysis

B07.2 Heat	B07.1 Test No.	C01	C	SI	MN	P	S	N	CU	MO	NI	CR	V	NB	SN	TI
390316	34322	K1	0,155	0,376	1,18	0,009	0,0008	0,0065	0,038	0,018	0,045	0,028	0,000	0,000	0,001	0,002
390318	97914	K1	0,170	0,375	1,18	0,006	0,0007	0,0067	0,022	0,012	0,041	0,038	0,000	0,000	0,001	0,001
390319	97714	K1	0,173	0,378	1,18	0,006	0,0008	0,0074	0,022	0,012	0,040	0,038	0,000	0,000	0,001	0,001

B07.2 Heat	B07.1 Test No.	C01	B	CA	AL-T
390316	34322	K1	0,0001	0,0017	0,033
390318	97914	K1	0,0000	0,0015	0,033
390319	97714	K1	0,0000	0,0013	0,034

C94 Product analysis Carbon equivalent / Alloying restrictions

B07.2 Heat	B07.1 Test No.	C01	FO-02=	FO-51=	FO-55=
390316	34322	K1	0,37	0,000	0,13
390318	97914	K1	0,38	0,000	0,11
390319	97714	K1	0,38	0,000	0,11

C94 Carbon equivalent formula / Alloying restrictions

FO-02 = C + (MN/6) + (CR+MO+V) / 5 + (NI+CU) / 15  
 FO-51 = V + NB  
 FO-55 = CU+MO+NI+CR  
 FO-78 = CR+MO  
 FO-91 = MN/C

A04 Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.



*B. Baldauf*



AG der Dillinger Hüttenwerke  
Postfach 1580, D-66748 Dillingen/Saar  
Inspection department

B. BALDAUF Test House Manager  
Inspector's stamp Date 04.12.13 PP 1

QM-System: Certification as per ISO 9001



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A02 INSPECTION CERTIFICATE 3.1 AS PER EN 10204:2004. INSPECTION CERTIFICATE 3.1.B AS PER EN 10204:1991+A1:1995 + AS PER ISO 10474:2013 MATERIAL TEST REPORT (MTR)		A10 Advice of dispatch No./ Date of dispatch 476277-04.12.13.	A06/Manufacturer's order/ A03:Certificate No. 388957-001	Sheet 6
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B02 Steel design: SA516-70	SA20-S5			
B03 Any suppl. requirements	ASME-III A:2010+ADDENDA-2011A DIL-HUE-1:R30-2012-10-01			

D01 Marking and identification, surface appearance, shape and dimensional properties

ITEM NO.: 01-02  
 EXAMINATION OF MARKING, SURFACE, SHAPE AND DIMENSIONS: THE RESULTS MEET THE REQUIREMENTS.  
 SURFACE AS PER ASME-SA20  
 THICKNESS AS PER ASME-SA20  
 LENGTH AND WIDTH AS PER ASME-SA20  
 FLATNESS AS PER 1/2-ASME-SA20



A04  Manufacturer's mark	Z01/Z02/Z03 We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.	 B. BALDAUF Test House Manager	 Inspector's stamp	AG der Dillinger Hüttenwerke Postfach 1580, D-66748 Dillingen/Saar Inspection department	A01
		Date 04.12.13.	PP	1	





**Red Deer College**

Box 5005, Red Deer, Alberta  
T4N 5H5

7114C

A.O.Q.P. No.

**WELDER PERFORMANCE QUALIFICATION CARD**

Troy Wells

[ Name ]

W-26268

[ ABSA File No. ]

This card is issued pursuant to the Safety Codes Act and Pressure Welder's Regulations. The performance qualification is in accordance with Section IX, A.S.M.E. Code and subject to the limitations on the reverse side.

April 18, 2016

Date of Test

Troy Wells

Signature of Welder

Bruce Macleod

Examiner (Print/Type)

CARD

1293

PERFORMANCE QUALIFICATION

CARD NO.

1293

Process(es)	<b>SMAW</b>	<b>SMAW</b>	Materials (P. No.)	<b>P1 to P1</b>
Filler Metal Group (F. No.)	<b>F3</b>	<b>F4</b>	Min. Outside Pipe Diameter	<b>25mm</b>
Max Deposited Weld Metal	<b>5.75mm</b>	<b>MTBW</b>	Position(s) Qualified	<b>All</b>
Backing	<b>Optional</b>	<b>Required</b>	Backing Gas	<b>N/A</b>
Progression	<b>Uphill</b>	<b>Uphill</b>		

April 18, 2018

P.Q. Expiry Date

*[Handwritten Signature]*

Weld Examiner Signature

E-00258

Certification No.

# Alberta

Municipal Affairs  
and Housing

21421

# ABSA

the pressure equipment safety authority

## Grade "B" Pressure Welder's Certificate of Competency

This is to certify that **Troy Wells**  
having complied with provisions of the Safety Codes Act, is authorized to engage  
in pressure welding in accordance with the prescribed Regulations.

Dated at Edmonton  
October 11, 2007



W-26268

.....  
File no.

A handwritten signature in black ink, appearing to read "Ian".

\_\_\_\_\_  
Chief Inspector and Administrator

012/957365

83929A



## JOURNEYMAN CERTIFICATE

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THIS IS TO CERTIFY THAT  
**TROY GRAHAM WELLS**  
HAS COMPLETED AN ALBERTA APPRENTICESHIP PROGRAM AND HAVING ACHIEVED  
THE STANDARDS ESTABLISHED UNDER THE ALBERTA APPRENTICESHIP AND  
INDUSTRY TRAINING ACT, IS HEREBY AUTHORIZED TO WORK IN THE TRADE AS A  
JOURNEYMAN AND TO USE THE TITLE CERTIFIED JOURNEYMAN

**WELDER**

EFFECTIVE DATE

June 14th, 2007

ISSUE DATE

July 16th, 2007

A handwritten signature in black ink, appearing to read "Doug Horner", located below the effective date.

HONOURABLE DOUG HORNER  
MINISTER OF ADVANCED EDUCATION  
AND TECHNOLOGY

**Alberta**  
Government

A handwritten signature in black ink, appearing to read "Shirley Dul", located below the issue date.

SHIRLEY DUL, EXECUTIVE  
DIRECTOR OF APPRENTICESHIP  
& INDUSTRY TRAINING

INTERPROVINCIAL  
STANDARD

**CANADA**

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J-22-87248

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NORME  
INTERPROVINCIALE

**CONTINUITY LOG**


Exhibit 11.3

ENVISION MANUFACTURING & SUPPLY LTD.  
QUALITY CONTROL MANUAL

2016


Welders Name & File Number	Symbol	Process/ Method	January - March	April - June	July - September	October - December
Troy Wells W-26268 Start Date: April 18, 2016	T	SMAW	N/A	✓	✓	✓
Jorge Butterwrick W-21370 Start Date: August 8, 2016	H	SMAW	N/A	N/A	✓	✓

Note: There must be confirmation of welding process use (i.e., continuity) in every three-month period in order to ensure that a six-month gap in continuity has not occurred.

	<b>Revision 4</b>	<b>May 1, 2015</b>
	<b>PR-ES-01 Piping Class</b>	A
	<b>CLASS:</b>	150
	<b>RATING:</b>	ASME/ANSI B16.5
<b>SERVICE:</b>	Hydrocarbon, unprocessed produced fluids, produced water, slop, fuel gas, flare, drain, glycol/water	
<b>Design Code</b>	ASME B31.3 – (2014)	
<b>Design Pressure:</b>	1 960 kPag (285 psig) @ 38°C (100°F). Design pressure derates with temperature per ratings of ASME B16.5	Note 1
<b>Design Temperature:</b>	-29 to 350°C (-20 to 650°F)	Note 2, 56
<b>Corrosion Allowance:</b>	1.6 mm (0.0625 in)	<b>Hydrotest Pressure:</b> 2940 kPag (428 psig)
<b>Inspection Requirements:</b>	Random 10% RT	<b>PWHT:</b> wt > 19 mm (¾")

PIPE:	NPS	WALL THICKNESS	END CONNECTIONS	DESCRIPTION	NOTES
	¾ to 1½	Sch 80 (XS)	Scrd/SW	ASTM A106 Grade B (SMLS) PE	3, 4, 5
	2 to 10	Sch 40	BW	ASTM A106 Grade B (SMLS) BE	
	12 to 16	STD	BW	ASTM A106 Grade B (SMLS) BE	


Components:	ITEM	NPS	RATING	END CONNECTIONS	DESCRIPTION	NOTES
	INSERT BLINDS	¾ to 16	Class 150	RF	ASTM A105/NA516 Grade 70	14
	BLIND FLANGE	¾ to 16	Class 150	RF	ASTM A105N	
	BOLTING (Nuts)				ASTM A194 Grade 2H	18
	BOLTING (Studs)				ASTM A193 Grade B7	19
	BUSHING	¾ to 1½	Class 3000	Scrd	ASTM A105N	3, 6, 7, 31
	CAP	¾ to 1½	Class 3000	Scrd/SW	ASTM A105N	3, 7, 31
	CAP	2 to 16	Match Pipe	BW	ASTM A234 Grade WPB	8
	COUPLING, Full and Half	¾ to 1½	Class 3000	Scrd/SW	ASTM A105N	3, 7, 31
	CROSS	¾ to 1½	Class 3000	Scrd/SW	ASTM A105N	3, 7, 31
	ELBOW, 45° & 90°, Long Radius	¾ to 1½	Class 3000	Scrd/SW	ASTM A105N	3, 7, 31
	ELBOW, 45° & 90° Straight & Reducing, Long Radius	2 to 16	Match Pipe	BW	ASTM A234 Grade WPB	8, 9
	ELBOLET	¾ to 1½	Class 3000	Scrd/SW	ASTM A105N	3, 7, 31
	FLANGE	¾ to 1½	Class 150	Scrd/SW	ASTM A105N	10
	FLANGE	2 to 16	Class 150	RFWN	ASTM A105N	10
	GASKETS	¾ to 16	Class 150	RF	Spiral wound 304 SS, flexible graphite filler	15
	NIPPLES (min length 100 mm)	¾ to 1½	Sch 80 (XS)	Scrd or PE	ASTM A106 Grade B SMLS	3
	ORIFICE FLANGES	2 to 12	Class 300	RF	ASTM A105N, bored to suite c/w 1/2 in taps and jack bolts	16
	PLUGS (Hex Head)	¾ to 1½	Class 3000	Scrd	ASTM A105N	3, 7, 31
	REDUCERS (Concentric & Eccentric)	2 to 16	STD	BW	ASTM A 234 Grade WPB	8
	RETURN (Long Radius)	2 to 16	STD	BW	ASTM A 234 Grade WPB	8
	SOCKOLET	¾ to 1½	Class 3000	SW	ASTM A105N	3, 11, 31
	SWAGE	¾ to 2	Class 3000	Scrd or PE	ASTM A105N or ASTM A234 WPB	3, 12, 30, 31
	TEE (Straight & Reducing)	¾ to 1½	Class 3000	Scrd/SW	ASTM A105N	3, 7, 31
	TEE (Straight & Reducing)	2 to 16	Std	BW	ASTM A 234 Grade WPB	8
	THREDOLET	¾ to 1½	Class 3000	Scrd	ASTM A105N	3, 11, 31
	TUBING	¾ to ½ (OD)	0.035 in wall	Tube/Scrd	A179 ElectroGalv. CS or A269 Gr316 SS with 316SS compression fittings	17
	UNION	¾ to 1½	Class 3000	Scrd/SW	ASTM A105N	3, 13, 31
	WELDOLET	2 to 8	STD	BW	ASTM A105N	11

	<b>Revision 4</b>	<b>May 1, 2015</b>
	<b>PR-ES-01 Piping Class</b>	A
	<b>CLASS:</b>	150
	<b>RATING:</b>	ASME/ANSI B16.5
<b>SERVICE:</b>	Hydrocarbon, unprocessed produced fluids, produced water, slop, fuel gas, flare, drain, glycol/water	
<b>Design Code</b>	ASME B31.3 – (2014)	
<b>Design Pressure:</b>	1 960 kPag (285 psig) @ 38°C (100°F). Design pressure derates with temperature per ratings of ASME B16.5	Note 1
<b>Design Temperature:</b>	-29 to 350°C (-20 to 650°F)	Note 2, 56
<b>Corrosion Allowance:</b>	1.6 mm (0.0625 in)	<b>Hydrotest Pressure:</b> 2940 kPag (428 psig)
<b>Inspection Requirements:</b>	Random 10% RT	<b>PWHT:</b> wt > 19 mm (¾")

Valves:	ITEM	NPS	RATING	END CONNECTIONS	DESCRIPTION	NOTES
	BALL	¾ to 1½	Class 2000	Scrd/SW	A105N / A216 WCB body, plated trim	3, 20, 21, 23, 56
	BALL	2 to 16	Class 150	RF	A105N / A216 WCB body, plated trim	20, 22, 23, 56
	CHECK	¾ to 1½	Class 800	Scrd/SW	A105N / A216 WCB body, Integral/Buna trim	23, 24, 56
	CHECK	2 to 16	Class 150	RF	A105N / A216 WCB body, Integral/Buna trim	23, 24, 56
	GATE	¾ to 1½	Class 800	Scrd/SW	A105N / A216 WCB body, F6 / HF trim	23, 25, 56
	GATE	2 to 16	Class 150	RF	A105N / A216 WCB body, F6 / HF trim	23, 26, 56
	GLOBE	¾ to 1½	Class 800	Scrd/SW	A105N / A216 WCB body, F6 / HF trim	23, 25, 56
	GLOBE	2 to 16	Class 150	RF	A105N / A216 WCB body, F6 / HF trim	23, 25, 56
	BUTTERFLY	2 to 16	Class 150	RF	A105N / A216 WCB body	32, 56
	NEEDLE	½ to ¾	Class 3000	Scrd/SW	A105 body, 316 SS trim	27, 56


NOTES:	NOTE #	DESCRIPTION
	1	Design Pressures based on B16.5 Table 2-1.1. Table values not direct conversion from Metric to Imperial
	2	Temperature deration above 38°C based on B16.5 Table 2-1-1 or valve design limitation
	3	Piping smaller than NPS 1 increased to Pipe Schedule XXS in vibrating service. Design engineer to calculate all mechanical loads. Consideration must be given to potential fatigue in vibrating service.
	4	Glycol piping must be socket welded.
	5	Thread Sealant Jet-Lube TF-15 or equal. For fuel gas systems at less than 15 psi, use Jetlube V-2 or alternate ULC-S642 approved.
	6	Bushings not permitted under cyclic service (pressure and/or temperature), vibrating service (i.e. near rotating equipment), or corrosive service. Busing size must be less than 2 to 1 in size ratio. Major dimension must not exceed 1-1/2" NPS.
	7	Forged steel fitting must meet the requirements of ASME B16.11.
	8	Buttwelding fitting must meet the requirements of ASME B16.9.
	9	Short radius elbow and returns shall not be used unless they satisfy the specification of the pipe and pressure rating restrictions imposed by ASME B16.28, Para. 2 (derated to 80% max. allowable stress value).
	10	ID of pipe bored to match pipe ID. Alteration of fitting must be performed by a fabricator with authorization to modify registered fitting.
	11	Forged branch outlet fittings must meet the requirements of MSS SP-97. Must specify both run pipe and schedule, and branch pipe and schedule with order as fitting must be sized to provide adequate reinforcement on the run pipe, as well as match wall of branch pipe.
	12	Swage nipples must meet the requirements of MSS SP-95. Bore and connections must meet the pipe requirements.
	13	Steel Unions must meet the requirements of MSS SP-83. Consideration must be given to grounding connection.
	14	Blinds must meet the requirements of ASME B16.48.
	15	Gasket must meet the requirements of ASME B16.20. Filler must meet the requirements for temperature and pressure.
	16	Orifice Flanges must meet the requirements of ASME B16.36. For applications on pipe larger than NPS 12, pressure taps shall be installed in piping a distance 1D upstream and 0.5D downstream of the orifice plate.
	17	Compression fitting components from different manufacturers must not be interchanged. Compression fitting valves must meet or exceed the pressure requirement and materials of construction of all valves listed in piping class.
	18	Two nuts required per stud.
	19	Studs must be lubricated with a molybdenum based lubricant prior to assembly.
	20	Design Engineer to select and or specify full port vs. reduced port, trunnion mount vs. floating ball, length pattern. All actuated valves shall be trunnion mounted.
	21	Valve may be constructed of bolted body or threaded body.
	22	Valve must not be one piece welded body.
	23	All valves shall conform to: ASME B16.34, API 600, and API 607 for ASME B31.3 code piping.
	24	Design Engineer to specify check valve type and any additional required design details.
	25	OS & Y, bolted bonnet, Design Engineer to specify full or reduced port.
	26	OS & Y, Design Engineer to specify full or reduced port.
	27	Screwed Bonnet, locked
	30	Swages must match end connection and wall thickness or schedule to matching piping dimension
	31	Threaded fittings Class 2000 acceptable
	32	Design Engineer to select seat material based on service
	56	All components must be reviewed for suitability to operate above 149C. Parts made of elastomers may not be suitable for temperatures above 149C. Metal seated valves may be required above 149C. Design engineer to confirm suitability.



	<b>Revision 4</b>	<b>May 1, 2015</b>
	<b>PR-ES-01 Piping Class</b>	AL
	<b>CLASS:</b>	150
	<b>RATING:</b>	ASME/ANSI B16.5
<b>SERVICE:</b>	LOW TEMP - Hydrocarbon, unprocessed produced fluids, produced water, slop, fuel gas, flare, drain, glycol/water	
<b>Design Code</b>	ASME B31.3 – (2014)	
<b>Design Pressure:</b>	1 960 kPag (285 psig) @ 38°C (100°F). Design pressure derates with temperature per ratings of ASME B16.5	Note 1
<b>Design Temperature:</b>	-45 to 350°C (-50 to 650°F)	Note 2, 56
<b>Corrosion Allowance:</b>	1.6 mm (0.0625 in)	<b>Hydrotest Pressure:</b> 2940 kPag (428 psig)
<b>Inspection Requirements:</b>	Random 10% RT	<b>PWHT:</b> wt > 19 mm (¾")

PIPE:	NPS	WALL THICKNESS	END CONNECTIONS	DESCRIPTION	NOTES
	¾ to 1½	Sch 80 (XS)	Scrd/SW	ASTM A333 Grade 6 (SMLS) PE	3, 4, 5
	2 to 10	Sch 40	BW	ASTM A333 Grade 6 (SMLS) BE	
	12 to 16	STD	BW	ASTM A333 Grade 6 (SMLS) BE	

Components:	ITEM	NPS	RATING	END CONNECTIONS	DESCRIPTION	NOTES
	INSERT BLINDS	¾ to 16	Class 150	RF	ASTM A350 LF2 Cl. 1/A516 Grade 70N	14, 33
	BLIND FLANGE	¾ to 16	Class 150	RF	ASTM A350 LF2 Cl. 1	
	BOLTING (Nuts)				ASTM A194 Grade 2HM	18
	BOLTING (Studs)				ASTM A193 Grade B7M	19
	BUSHING	¾ to 1½	Class 3000	Scrd	ASTM A350 LF2 Cl. 1	3, 6, 7, 31
	CAP	¾ to 1½	Class 3000	Scrd/SW	ASTM A350 LF2 Cl. 1	3, 7, 31
	CAP	2 to 16	Match Pipe	BW	ASTM A420 Grade WPL6	8
	COUPLING, Full and Half	¾ to 1½	Class 3000	Scrd/SW	ASTM A350 LF2 Cl. 1	3, 7, 31
	CROSS	¾ to 1½	Class 3000	Scrd/SW	ASTM A350 LF2 Cl. 1	3, 7, 31
	ELBOW, 45° & 90°, Long Radius	¾ to 1½	Class 3000	Scrd/SW	ASTM A350 LF2 Cl. 1	3, 7, 31
	ELBOW, 45° & 90° Straight & Reducing, Long Radius	2 to 16	Match Pipe	BW	ASTM A420 Grade WPL6	8, 9
	ELBOLET	¾ to 1½	Class 3000	Scrd/SW	ASTM A350 LF2 Cl. 1	3, 7, 31
	FLANGE	¾ to 1½	Class 150	Scrd/SW	ASTM A350 LF2 Cl. 1	10
	FLANGE	2 to 16	Class 150	RFWN	ASTM A350 LF2 Cl. 1	10
	GASKETS	¾ to 16	Class 150	RF	Spiral wound 304 SS, flexible graphite filler	15
	NIPPLES (min length 100 mm)	¾ to 1½	Sch 80 (XS)	Scrd or PE	ASTM A333 Grade 6 (SMLS)	3
	ORIFICE FLANGES	2 to 12	Class 300	RF	ASTM A350 LF2 Cl. 1, bored to suite c/w ½ in taps and jack bolts	16
	PLUGS (Hex Head)	¾ to 1½	Class 3000	Scrd	ASTM A350 LF2 Cl. 1	3, 7, 31
	REDUCERS (Concentric & Eccentric)	2 to 16	STD	BW	ASTM A420 Grade WPL6	8
	RETURN (Long Radius)	2 to 16	STD	BW	ASTM A420 Grade WPL6	8
	SOCKOLET	¾ to 1½	Class 3000	SW	ASTM A350 LF2 Cl. 1	3, 11, 31
	SWAGE	¾ to 2	Class 3000	Scrd or PE	ASTM A350 LF2 Cl. 1 or ASTM A420 Grade WPL6	3, 12, 30, 31
	TEE (Straight & Reducing)	¾ to 1½	Class 3000	Scrd/SW	ASTM A350 LF2 Cl. 1	3, 7, 31
	TEE (Straight & Reducing)	2 to 16	Std	BW	ASTM A420 Grade WPL6	8
	THREDOLET	¾ to 1½	Class 3000	Scrd	ASTM A350 LF2 Cl. 1	3, 11, 31
	TUBING	¾ to ½ (OD)	0.035 in wall	Tube/Scrd	A269 Gr316 SS with 316SS compression fittings	17
	UNION	¾ to 1½	Class 3000	Scrd/SW	ASTM A350 LF2 Cl. 1	3, 13, 31
	WELDOLET	2 to 8	STD	BW	ASTM A350 LF2 Cl. 1	11


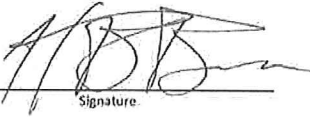

	<b>Revision 4</b>	<b>May 1, 2015</b>
	<b>PR-ES-01 Piping Class</b>	AL
	<b>CLASS:</b>	150
	<b>RATING:</b>	ASME/ANSI B16.5
<b>SERVICE:</b>	LOW TEMP - Hydrocarbon, unprocessed produced fluids, produced water, slop, fuel gas, flare, drain, glycol/water	
<b>Design Code</b>	ASME B31.3 – (2014)	
<b>Design Pressure:</b>	1 960 kPag (285 psig) @ 38°C (100°F). Design pressure derates with temperature per ratings of ASME B16.5	Note 1
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<b>Corrosion Allowance:</b>	1.6 mm (0.0625 in)	<b>Hydrotest Pressure:</b> 2940 kPag (428 psig)
<b>Inspection Requirements:</b>	Random 10% RT	<b>PWHT:</b> wt > 19 mm (%")

<b>Valves:</b>	<b>ITEM</b>	<b>NPS</b>	<b>RATING</b>	<b>END CONNECTIONS</b>	<b>DESCRIPTION</b>	<b>NOTES</b>
	BALL	¾ to 1½	Class 2000	Scrd/SW	A350 LF2 Cl.1 / A352 LCC body, 316 SS trim	3, 20, 21, 23, 56
	BALL	2 to 16	Class 150	RF	A350 LF2 Cl.1 / A352 LCC body, 316 SS trim	20, 22, 23, 56
	CHECK	¾ to 1½	Class 800	Scrd/SW	A350 LF2 Cl.1 / A352 LCC body, Integral/Buna trim	23, 24, 56
	CHECK	2 to 16	Class 150	RF	A350 LF2 Cl.1 / A352 LCC body, Integral/Buna trim	23, 24, 56
	GATE	¾ to 1½	Class 800	Scrd/SW	A350 LF2 Cl.1 / A352 LCC body, F6 / HF trim	23, 25, 56
	GATE	2 to 16	Class 150	RF	A350 LF2 Cl.1 / A352 LCC body, F6 / HF trim	23, 26, 56
	GLOBE	¾ to 1½	Class 800	Scrd/SW	A350 LF2 Cl.1 / A352 LCC body, F6 / HF trim	23, 25, 56
	GLOBE	2 to 16	Class 150	RF	A350 LF2 Cl.1 / A352 LCC body, F6 / HF trim	23, 25, 56
	BUTTERFLY	2 to 16	Class 150	RF	A350 LF2 Cl.1 / A352 LCC body	32, 56
	NEEDLE	½ to ¾	Class 3000	Scrd	ASTM A182 F316 body, 316 SS trim	27, 56
<b>NOTES:</b>	<b>NOTE #</b>	<b>DESCRIPTION</b>				
	1	Design Pressures based on B16.5 Table 2-1.1. Table values not direct conversion from Metric to Imperial				
	2	Temperature deration above 38°C based on B16.5 Table 2-1-1 or valve design limitation				
	3	Piping smaller than NPS 1 increased to Pipe Schedule XXS in vibrating service. Design engineer to calculate all mechanical loads. Consideration must be given to potential fatigue in vibrating service.				
	4	Glycol piping must be socket welded.				
	5	Thread Sealant Jet-Lube TF-15 or equal. For fuel gas systems at less than 15 psi, use Jetlube V-2 or alterate ULC-S642 approved.				
	6	Bushings not permitted under cyclic service (pressure and/or temperature), vibrating service (i.e. near rotating equipment), or corrosive service. Busing size must be less than 2 to 1 in size ratio. Major dimension must not exceed 1-1/2" NPS.				
	7	Forged steel fitting must meet the requirements of ASME B16.11.				
	8	Buttwelding fitting must meet the requirements of ASME B16.9.				
	9	Short radius elbow and returns shall not be used unless they satisfy the specification of the pipe and pressure rating restrictions imposed by ASME B16.28, Para. 2 (derated to 80% max. allowable stress value).				
	10	ID of pipe bored to match pipe ID. Alteration of fitting must be performed by a fabricator with authorization to modify registered fitting.				
	11	Forged branch outlet fittings must meet the requirements of MSS SP-97. Must specify both run pipe and schedule, and branch pipe and schedule with order as fitting must be sized to provide adequate reinforcement on the run pipe, as well as match wall of branch pipe.				
	12	Swage nipples must meet the requirements of MSS SP-95. Bore and connections must meet the pipe requirements.				
	13	Steel Unions must meet the requirements of MSS SP-83. Conisderation must be given to grounding connection.				
	14	Blinds must meet the requirements of ASME B16.48.				
	15	Gasket must meet the requirements of ASME B16.20. Filler must meet the requirements for temperature and pressure.				
	16	Orifice Flanges must meet the requirements of ASME B16.36. For applications on pipe larger than NPS 12, pressure taps shall be installed in piping a distance 1D upstream and 0.5D downstream of the orifice plate.				
	17	Compression fitting components from different manufacturers must not be interchanged. Compression fitting valves must meet or exceed the pressure requirement and materials of construction of all valves listed in piping class.				
	18	Two nuts required per stud.				
	19	Studs must be lubricated with a molybdenum based lubricant prior to assembly.				
	20	Design Engineer to select and or specify full port vs. reduced port, trunnion mount vs. floating ball, length pattern. All actuated valves shall be trunnion mounted.				
	21	Valve may be constructed of bolted body or threaded body.				
	22	Valve must not be one piece welded body.				
	23	All valves shall conform to: ASME B16.34, API 600, and API 607 for ASME B31.3 code piping.				
	24	Design Engineer to specify check valve type and any additional required design details.				
	25	OS & Y, bolted bonnet, Design Engineer to specify full or reduced port.				
	26	OS & Y, Design Engineer to specify full or reduced port.				
	27	Screwed Bonnet, locked				
	30	Swages must match end connection and wall thickness or schedule to matching piping dimension				
	31	Threaded fittings Class 2000 acceptable				
	32	Design Engineer to select seat material based on service				
	33	ASTM A 516 Grade 70N Mateial must be impact tested for low temperature service				
	56	All components must be reviewed for suitability to operate above 149C. Parts made of elastomers may not be suitable for temperatures above 149C. Metal seated valves may be required above 149C. Design engineer to confirm suitability.				

**SPEC DEVIATION  
APPROVAL**

Job #: 16182

ENVISION MANUFACTURING & SUPPLY LTD.  
3809, 53 Avenue, Lacombe, AB T4L 2L6  
403.782.7708

<b>Customer Name:</b> <u>Paramount Resources Ltd.</u>	<b>Date:</b> <u>December 9, 2016</u>	
<b>Deviation Request Prepared By:</b> <u>Tasha McDonald</u> <small>Print Name</small>	<u></u> <small>Signature</small>	<u>Dec 9/16</u> <small>Date</small>
<b>Description of Deviation:</b>		
Paramount Resources Spec PR-ES-01 Class A Rev4 and Class AL Rev4 specify that 2NPS pipe is to be Sch 40 and butt weld		
This deviation to accept for this Instrument Air Compressor Package, the use of 2NPT connections using 2 NPS sched 80 pipe		
<b>We approve the above described spec deviation for job number 16182</b>		
<b>Customer Representative:</b> <u>Harold B Braun</u> <small>Print Name</small>	<u></u> <small>Signature</small>	<u>December 9, 2016</u> <small>Date</small>
<b>EnVision Representative:</b> <u>Tasha McDonald</u> <small>Print Name</small>	<u></u> <small>Signature</small>	<u>Dec 9/16</u> <small>Date</small>



# SECTION 4

Bay 2, 3809 53<sup>rd</sup> Avenue  
Lacombe, AB  
T4L 2L6  
403.304.8314

# Spring Operated Valve Data Sheet

12/8/2016 8:30 AM

ENG-710000CLIST v6.4CLIST

31-Jul-14

SAK



**MERCER VALVE CO., INC.**  
"AUTO SEAT TECHNOLOGY"

Page: \_\_\_\_\_

**Customer Name:** Tasha McDonald  
**Company:** Envision Manufacturing  
**Location:** Job # 16182  
**Phone:**  
**Fax:**  
**Quote #:**  
**Reference #:** QMV001310 Rev3  
**Tag Number:** PSV-2231-01/02/03/05

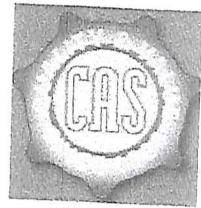
PERMISSION TO PROCEED DOES NOT CONSTITUTE ACCEPTANCE OR VERIFICATION OF DESIGN DETAILS, CALCULATIONS, ANALYSES, TEST METHODS OR MATERIALS DEVELOPED OR SELECTED BY THE SUPPLIER AND DOES NOT RELIEVE SUPPLIER FROM FULL COMPLIANCE WITH CONTRACTUAL OBLIGATIONS.

1.  WORK MAY PROCEED.  
 2.  REVISE AND RESUBMIT. WORK MAY PROCEED SUBJECT TO INCORPORATION OF CHANGES INDICATED.  
 3.  STOP WORK PER ATTACHED WRITTEN INSTRUCTIONS.  
 4.  REVIEW NOT REQUIRED. WORK MAY PROCEED.

BY: HJB DATE: **DEC 09 2016**

<b>FLUID DATA</b>	FLUID	FLUID STATE	Air	GAS
	MOLECULAR WEIGHT	SPECIFIC GRAVITY	29.000	1.000
	RATIO of SPECIFIC HEATS	Gas Constant	1.40	356
	COMPRESSIBILITY FACTOR		1.000	
<b>SIZING INFORMATION</b>	REQUIRED CAPACITY		130.00	scfm
	SUPERIMPOSED CONST BP	SUPERIMPOSED VARI	0.00	0.00 psig
	BUILT-UP BACK PRESSURE	TOTAL BACK PRESSURE	0.00	0.00 psig
	OPERATING TEMPERATURE	RELIEVING TEMPERATURE	43.00	43.0 °C
	OPERATING PRESSURE	ATMOSPHERIC PRESSURE	1310.00	13.34 psia
	SET PRESSURE	FLOWING PRESSURE	1551.00	1798.08 kPa-a
	CDTP	OVER PRESSURE	1551.0	10.00 %
	DISCHARGE COEFFICIENT AND AREAS		ASME, Section VIII, Div. 1	
VALVE CERTIFICATION / DESIGN CODE		ASME BOILER AND PRESSURE VESSEL CODE, SECTION VIII, DIVISION 1 CERTIFIED		
SYSTEM TYPE		Vessel or Pipeline		
<b>SIZING RESULTS</b>	REQUIRED AREA	FLOW COEFFICIENT	0.035	in <sup>2</sup>
	SELECTED ORIFICE		"C" Orifice	0.062 in <sup>2</sup>
	MAXIMUM CAPACITY of VALVE AT OVER PRESS.		231.73 scfm	
	TAG CAPACITY		243.71 SCFM AIR	
DECIBEL LEVEL	REACTION FORCE	94	dB @ 100 ft	116 N w/OUTLET PRESS-OVER PRESS
<b>MATERIALS</b>	VALVE BODY MATERIAL	INLET MATERIAL	WCB CARBON STEEL	CARBON STEEL
	BONNET MATERIAL	BONNET TYPE	CARBON STEEL	CLOSED
	NOZZLE MTRL	NOZZLE TYPE	17-4 STNLS STL	SEMI NOZZLE
	DISK MATERIAL		440C STNLS STL	
	SEAT MATERIAL	O-RING MATERIAL	VITON 90 DUROMETER	STD (VITON & BUNA-N)
SPRING MATERIAL		17-7 PH STAINLESS STEEL		
<b>OPTIONS</b>	1/4" PIPE TAP		NO	
	SOUR GAS SERVICE		NO	
	CAP TYPE		OPEN LIFT LEVER	
<b>VALVE INFORMATION</b>	VALVE TYPE		9100 THREADED	
	PART NUMBER		91-17C52V06C1	
	INLET X OUTLET		1" MNPT x 1" FNPT	
	CENTER TO FACE DIMENSIONS		A = 3-1/4 in.	B = 1-7/8 in.
	REPAIR KIT NUMBER		1C2V1C1	
QUANTITY		4		
<b>DISCLAIMER</b>	As per ASME code, Section VIII, Division 1, para. UG-125(a), the customer accepts all responsibility in insuring that the correct pressure relief valve is installed for their application. The purchase order for the pressure relief valve confirms the sizing calculations and material compatibility choices made by Mercer Valve are correct for the application. This sizing program does not take material compatibility or pressure and temperature limitations into account for choosing materials. Please verify all material choices with Mercer Valve Company, Inc.			
<b>NOTES</b>				

# Rotary Screw Compressor Production Check List

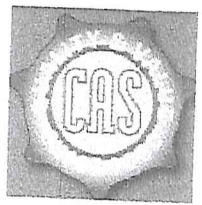


Customer Name IND - ENVI  
Model # IND - SR 253ENC S/N# 120716-3110  
Pump up Time 0-125psi \_\_\_\_\_ 0-150psi \_\_\_\_\_ 0-175psi \_\_\_\_\_  
Motor HP 25 Motor Phase 1 or 3 480 0-190psi: 1:49  
Motor Standard Amps 28  
Motor FLA Amps w/service factor 32.2  
Motor Amps at Max operating Pressure 31.12  
Pressure Gauge Functioning   
Oil & Air Lines tight   
Operating Pressure Set at 190 psi  
Operating Temperature 185°F Temperature Switch High Temp Functioning   
Motor Pulley in line  Motor Pulley Size 6.90  
Airend Pulley in Line  Airend Pulley Size 3.15  
Belts tight  Belt Size 560  
Airend Oil Full   
Air and oil Line fittings installed with sealant or seal tape   
Timed shut down working (Elite/CRD) 10min  
High Pressure Switch Working  High Pressure Switch Set at 195 psi  
Sales Order # 2016-004924

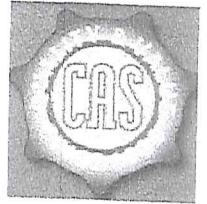
Signature Assembly tech Eric Menehoy

Date of Assembly 12-7-16

Attach to invoice and original PO when complete



# Rotary Screw Compressor Production Check List



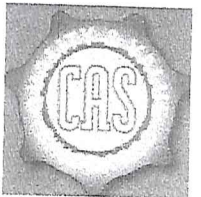
Customer Name IND - ENVI  
Model # IND - SR253EDC S/N# 120716-3111  
Pump up Time 0-125psi \_\_\_\_\_ 0-150psi \_\_\_\_\_ 0-175psi 1:35  
Motor HP 25 Motor Phase 1 or 3 480  
Motor Standard Amps 28 0-195psi 1:44  
Motor FLA Amps w/service factor 32.2  
Motor Amps at Max operating Pressure 31.82  
Pressure Gauge Functioning   
Oil & Air Lines tight   
Operating Pressure Set at 190 psi  
Operating Temperature 185°F Temperature Switch High Temp Functioning   
Motor Pulley in line  Motor Pulley Size 6.90  
Airend Pulley in Line  Airend Pulley Size 3.15  
Belts tight  Belt Size 560  
Airend Oil Full   
Air and oil Line fittings installed with sealant or seal tape   
Timed shut down working (Elite/CRD) 10min  
High Pressure Switch Working  High Pressure Switch Set at 195 psi  
Sales Order # 2016-004924

Signature Assembly tech VICENTE GARCIA

Date of Assembly 12-7-16

Attach to invoice and original PO when complete

**Intertek**  
 Reviewed  
 Witnessed  
Initial: NG  
Date: 01/17/17  
CA-0077



**HYDROSTATIC TEST REPORT**

ENVISION MANUFACTURING & SUPPLY LTD.  
QUALITY CONTROL MANUAL

JOB NO.: 16182 EQUIPMENT DESCRIPTION: 25HP IA Compressor Package

SERIAL NO.: N/A CONSTRUCTION DRAWING NO.: 16182 DUAL-25HP-INST AIR PID REV NO.: 1

LINE NO.: ALL LINES ~~TUBESIDE~~ HYDROSTATIC TEST PRESSURE: 338 PSI/KPA

SHELL SIDE HYDROSTATIC TEST PRESSURE: N/A PSI/KPA

GAUGE IDENTIFICATION		CALIBRATION DATE	GAUGE RANGE	GAUGE PRESSURE
	SERIAL NO.			
GAUGE #1	103268	11-Apr-16	0-600psi	338psi
GAUGE #2	103269	11-Apr-16	0-600psi	338psi
CHART RECORDER				

MANUFACTURER'S REPRESENTATIVE: *Pastore* DATE: January 9, 2017

OWNER'S INSPECTOR: *[Signature]* DATE: Jan 9, 2017

AUTHORIZED INSPECTOR: N/A DATE: N/A





ENVISION MANUFACTURING & SUPPLY LTD.  
QUALITY CONTROL MANUAL

No.	PRESSURE TEST PREPARATION	Initial & Date
1	All punch list items are corrected.	JUCO JAN 09 2017
2	Test blinds are of correct thickness.	JUCO JAN 09 2017
3	All items which could be damaged by test isolated or removed (control valves, safety valves, instruments, expansion joints etc.).	JUCO JAN 09 2017
4	Equipment with internals (eg. Filters) that could be damaged is isolated as required.	JUCO JAN 09 2017
5	Vents and drains are correctly installed.	JUCO JAN 09 2017
6	Open and closed position of all valves are verified.	JUCO JAN 09 2017
7	Shipping bars in place (bellows).	NIA
8	Hanger stops in place.	NIA

No.	PRESSURE TEST COMPLETION	Initial & Date
1	All temporary blinds (blanks) removed.	JUCO JAN 09 2017
2	All temporary gaskets replaced by correct gaskets.	NIA
3	Temporary supports removed.	NIA
4	Shipping bars removed from bellows.	NIA
5	Spring hanger stops removed and cold setting is checked.	NIA
6	Pressure relief valves - "UV" or "V" symbol as applicable and at correct set pressure and capacity are installed.	JUCO JAN 16 2017
7	Safety valve vents are the correct size and are adequately supported. Drain holes and/or weather hoods are installed.	JUCO JAN 16 2017
8	Screens for pumps and compressors are installed (initial start-up and permanent screens).	NIA.

QC Inspector Signature: TASHA McDONALD [Signature]  
Print & Sign

JAN 16 2017  
Date



Job#79177

277 Burnt Park Drive  
Red Deer County, AB  
T4S 0K7

Ph. 403-343-2822  
Fax 403-347-1470  
Email: [info@kingsenergy.com](mailto:info@kingsenergy.com)  
Web: [www.kingsenergy.com](http://www.kingsenergy.com)

### PRESSURE GAUGE VERIFICATION TEST CERTIFICATE

This gauge has been calibrated by adjusting the instrument or compiling a deviation chart so that its reading can be correlated to the actual value being measured. We certify that the gauge identified below has been verified with precise test equipment and the variance has been recorded in the table below.

**MODEL AND RANGE: 4"BM1/2"NPT - Marsh - 0-600PSI**

**GAUGE No.: 103268 Company: ENVISION MANUFACTURING AND SUPPLY**

Temperature at time of Calibration: 22C

#### INDICATED VALUE      DIGITAL READINGS      VARIANCE

INDICATED VALUE	UNIT	DIGITAL READINGS	UNIT	VARIANCE	UNIT	PERCENT
0	psi	0.0	psi	0	psi	0.00%
100	psi	102.7	psi	2.7	psi	0.45%
200	psi	205.5	psi	5.5	psi	0.92%
300	psi	306.0	psi	6	psi	1.00%
400	psi	404.2	psi	4.2	psi	0.70%
500	psi	502.3	psi	2.3	psi	0.38%
600	psi	600.3	psi	0.3	psi	0.05%

**TECHNICIAN: Curtis Smith DATE: 04/11/2016**

The above instrument was compared to a King's Crystal 2KPSIXP2I digital gauge serial # 546828 which was compared to a Chandler Deadweight model 5-145, serial # 23-77 Deadweight tester traceable through Institute for National Measurement Standards (I.N.M.S) Canada.

Signature: \_\_\_\_\_



Job#79177

277 Burnt Park Drive  
Red Deer County, AB  
T4S 0K7

Ph. 403-343-2822  
Fax 403-347-1470  
Email: [info@kingsenergy.com](mailto:info@kingsenergy.com)  
Web: [www.kingsenergy.com](http://www.kingsenergy.com)

### PRESSURE GAUGE VERIFICATION TEST CERTIFICATE

This gauge has been calibrated by adjusting the instrument or compiling a deviation chart so that its reading can be correlated to the actual value being measured. We certify that the gauge identified below has been verified with precise test equipment and the variance has been recorded in the table below.

**MODEL AND RANGE: 4"BM1/2"NPT - Marsh - 0-600PSI**

**GAUGE No.: 103269 Company: ENVISION MANUFACTURING AND SUPPLY**

Temperature at time of Calibration: 22C

**INDICATED VALUE      DIGITAL READINGS      VARIANCE**

0	psi	0.0	psi	0	psi	0.00%
100	psi	100.1	psi	0.1	psi	0.02%
200	psi	202.2	psi	2.2	psi	0.37%
300	psi	305.0	psi	5	psi	0.83%
400	psi	404.5	psi	4.5	psi	0.75%
500	psi	503.1	psi	3.1	psi	0.52%
600	psi	598.4	psi	-1.6	psi	-0.27%

**TECHNICIAN: Curtis Smith DATE: 04/11/2016**

The above instrument was compared to a King's Crystal 2KPSIXP2I digital gauge serial # 546828 which was compared to a Chandler Deadweight model 5-145, serial # 23-77 Deadweight tester traceable through Institute for National Measurement Standards (I.N.M.S) Canada.

Signature: \_\_\_\_\_

**NDE REQUEST/RECORD**

ENVISION MANUFACTURING & SUPPLY LTD.  
QUALITY CONTROL MANUAL

Work Order Number: 16182 Date: Dec 29, 2016  
 NDE Required: 10% Random Radiography Requested By: Tasha McDonald  
 Line/Unit #: 2231-AO-2"-AL-17 PO#: 16182-H  
 Pipe Size/Schedule: 2" SCH40 P#/Material: P-1 Group 2/SA-333 Gr 6  
 Acceptance Criteria (code): B31.3 Normal Fluid Service

Weld #	Welder Symbol	Drawing Number	Spool #	Weld #	Welder Symbol	Drawing Number	Spool #
1		16182- DUAL-25HP-INST AIR SPOOL	1-1				

QCI Signature: *Bostancic* Date: Dec 29/16

**NOTES:**

- \* The following identification shall be plainly and permanently included on the RT film:
  - \* EnVision Job Number
  - \* Weld Number
  - \* Line Number
  - \* Welder Symbol
  - \* Unit Number
  - \* Date of NDE
- \* Flagging system:
  - \* EnVision will identify welds for RT with a blue ribbon. The NDE contractor will remove the blue ribbon upon acceptance of the weld. On the occasion that there is a repair, the NDE contractor will attach a red ribbon to the weld and clearly identify the area requiring repair with a suitable marker.

**RADIOGRAPHIC INTERPRETATION REPORT**

Invoice #: **TLH16113**

Report #: **TLH161132-4**

Page: **1 of 2**

**Hunt Inspection Ltd. - Offices**

Stettler, Alberta  
Box 248, Stettler, AB, T0C 2L0  
PH: 403-742-4868  
FAX: 403-742-4858

Lacombe, Alberta  
PH: 403-782-7855  
FAX: 403-782-0260

web: www.huntinspection.com

Technician Sign: 

Technician Certification:

TANNER HUNT  
SNT LEVEL II  
CGSB 48.9712  
LEVEL II #11784

Assistant:

Date:  
Client:

DECEMBER 29/2016

**ENVISION  
MANUFACTURING LTD.**

Location:


LACOMBE SHOP

Reg. Hours	O.T. Hours	Total Hours	K.M.
-	-	-	-

Acceptance Code: ASME B.31.3 Normal  
Specification:  
Hunt QC Procedure:  
Contractor:  
Job#: 16182  
A.F.E.#:  
P.O.#: 16182-H  
Ser#:  
Client ID:  
Q.C.#:

Field Weld Number (s)	Size	Wall Thickness	No. of Exposures	Welder Symbol	Material	Source to Object Distance	Object to Film Distance	Hunt Q.C. Technique No.	Film	Image Quality Indicator	Single Wall Exposure	Double Wall Exposure	Single Wall Viewing	Double Wall Viewing	Undercut	Incomplete Penetration	Concave Bead	Hollow Bead	Slag	High Low	Film Mark	Burn Through	Porosity	Excess Penetration	Low Cover	Shadow	Remarks	Accept	Reject							
																														ITEMS INSPECTED:	FABRICATION					
1																																				
2	X-1	2"	.218'	3	T C	2"	.280"	3	A 1	✓	✓																									
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**Intertek**  
 Reviewed  
 Witnessed  
 Initial: *MA*  
 Date: 01/09/17  
 CA - 0077

LEGEND				Exposure Information		Report Acceptance	
Film	Image Quality Indicator	Weld Defects	Material	Radiation Source:	IR-192	Client Rep. <b>NATASHA MCDONALD</b>	
A - Carestream T125	ASTM Wire Type		C = Carbon Steel	Focal Spot Size:	3.8MM		
B - Carestream T200	1 - 1A Film Side	4 - 1B Source Side	S = Stainless Steel	Front Lead Screen Thick:	.010"		
C - AGFA Class (I) D5	2 - 1A Source Side	5 - 1C Film Side	C/S = Carbon Steel to	Back Lead Screen Thick:	.010"		
D - Other	3 - 1B Film Side	6 - 1C Source Side	Stainless Steel	Film Per Cassette	1	Client Rep. Sign:	

## MT - PT - UT INTERPRETATION REPORT

Invoice #:

TLH16113

Report #:

TLH16113-SMT

Page:

2 of 2

**Hunt Inspection Ltd. - Offices**

Stettler, Alberta  
Box 248, Stettler, AB, T0C 2L0  
PH: 403-742-4868  
FAX: 403-742-4858

Lacombe, Alberta  
PH: 403-782-7855  
FAX: 403-782-0260

web: www.huntinspection.com

Technician Sign:

Date:

DECEMBER 29/2016

Client:

ENVISION MANUFACTURING  
AND SUPPLY LTD.

Technician Certification:

TANNER HUNT  
SNT LEVEL II  
CGSB 48.9712  
#11784

Location:

LACOMBE FACILITY

Acceptance Code:

ASME B.31.3 N.F.S.

Specification:

Sec. V. Article. 7

Hunt QC Procedure:

MT-1 Rev.9

Technique:

1

Contractor:

Job#:

16182

A.F.E.#:

Client ID:

16182-H

A#:

Ser#:

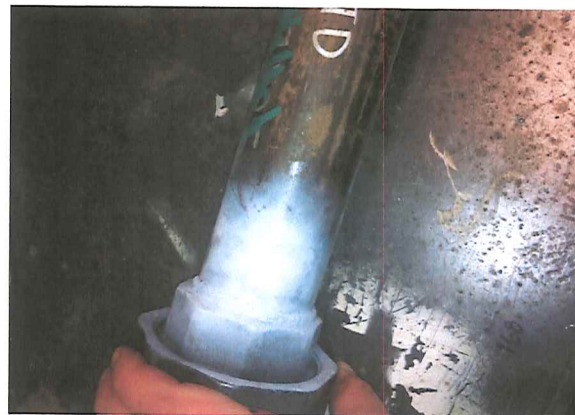
Reg. Hours	O.T. Hours	Total Hours	K.M.
-	-	-	-

Field Weld Number (s)	Size	Thickness	Material	Welder Symbol	Remarks	Accept	Reject
-----------------------	------	-----------	----------	---------------	---------	--------	--------

ITEMS INSPECTED:

MT-1	2"	S.O.L	C	T			
						✓	

MP-1



Comments:

Material Legend	Equipment	Inspection Information	Report Acceptance
C = Carbon Steel	PARKER AC HAND YOKE / MODEL B300	Method: MT - Wet Visible, Black On White	Client Rep. NATASHA MCDONALD Client Rep. Sign:
S = Stainless Steel	Ser: 8857	Lighting: Visible Light < 1000 lux	
C/S = Carbon Steel to Stainless Steel	SHERWIN WHITE CONTRAST AID PAINT	Surface Condition: Smooth Bare Steel (Buffed)	
A = Aluminum	SHERWIN BLACK MAG SUSPENSION NO.1	Surface Temperature: Ambient	
	Batch: 416-H23	Current: 10 lb Lift at 9" Leg Spacing - 3 Pass	
	Batch: 32-J42		

Tanner L. Hunt	CGSB 48.9712	Level II	RT - MT	#11784
	SNT	Level II	RT - MT - PT	

Natural Resources  
Canada

Ressources naturelles  
Canada

Name/ Nom: **Tanner L. Hunt**

Reg. No. / No. matricule: **11784**

Issue Date / Date d'émission: **2016/01/15**

This card does not identify the stated individual to be an employee or representative of Natural Resources Canada, Government of Canada. Cette carte n'identifie pas l'individu d'être un employé ou un représentant de Ressources naturelles Canada, Gouvernement du Canada.

Corrective lenses for [ ] near [X] far vision.  
Verres correctifs pour la vision de [ ] près [X] distance.

Signature:

Natural Resources  
Canada

Ressources naturelles  
Canada

Certified to / Certifié selon: CAN-CGSB-48 9712

11784

Method / Methode	Level / Niveau	Sector / Secteur	Cert. Date / Date cert.	Date recert. / Date recert.	Expires / Expiration
MT	2	EMC	2010/09/30		2020/04/15
RT	2	EMC	2005/07/28		2020/04/15

For verification of certification status, policies and definitions, visit website: <http://ndt.nrcan.gc.ca/> Pour la vérification de la certification, les politiques, et les définitions, visitez le site web: <http://ndt.nrcan.gc.ca/>

Manager / Certifying Agency / Gestionnaire / Organisme de certification:

**SNT CERTIFICATION**

**Tanner Hunt**

has met the requirements of SNT certification in accordance with *Hunt Inspection Ltd.* written practice that meets the requirements of ASNT recommended practice SNT-TC-1A 2006 edition, in the nondestructive testing methods listed on the reverse side of this card.

**SNT CERTIFICATION**

Technician: <b>Tanner Hunt</b>		
SNT Method	Level	Expiry Date
RT	II	December 31, 2018
MT	II	December 31, 2018
PT	II	December 31, 2018

Level III Examiner: **Joel Norman**

Signature of Level III Examiner:

Date of Issue: **January 1, 2016**

Intertek

Reviewed

Witnessed

Initial: *ST*

Date: *01/09/17*

CA - 0077

**NDT PERSONNEL CERTIFICATION TO THE STANDARD  
CAN/CGSB 48.9712-2014 & ASNT SNT-TC-1A 2006 & 2011  
ANNUAL EYE EXAMINATION REPORT**

In accordance with the Standard CAN/CGSB 48.9712 "Non-destructive Testing – Qualification and Certification of Personnel" and ANST recommended practice SNT-TC-1A, this Eye Examination Report, consisting of three vision requirements: Near Vision, Distance Vision, and Colour Vision for examination in any of the of NDT Methods

APPLICANT'S NAME: TANNER HUNT REGISTRATION NUMBER: #11784

I am submitting for the following: (Please check)

EXAMINATION  RENEWAL  RE-CERTIFICATION

**NEAR VISION ACUITY:** shall permit reading of a Jaeger number 1 or equivalent letters at not less than 30 cm with one or both eyes, either corrected or uncorrected.

I CONFIRM THAT THE CANDIDATE:

- Meets *without* correction
- Meets *with* correction
- Does not meet

**DISTANCE VISION ACUITY:** shall be equal to or better than Snellen Fraction 20/30 with one or both eyes, either corrected or uncorrected.

I CONFIRM THAT THE CANDIDATE:

- Meets *without* correction
- Meets *with* correction
- Does not meet

Dorrin Hunt  
Examiners Name

President  
Appointment/Title

  
Examiners Signature

January 8, 2016  
Date of Eye Examination

**COLOUR & GRAYSCALE CONTRAST DIFFERENTIATION**

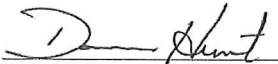
The following tests must be completed:

- (1) Colours using the HHR 4<sup>th</sup> Edition 24 tablet test for colour blindness for the NDT method(s) concerned.
- (2) Grayscale using Kodak Industrex Calibrated step tablet, density strip, 1-10 for the NDT method(s) concerned.

I CONFIRM THAT THE CANDIDATE CAN DISTINGUISH BETWEEN THE COLOURS AND CONTRASTS OF THE ABOVE TESTS IN THE NDT METHOD(S) CONCERNED:

Dorrin Hunt  
Examiners Name

President  
Appointment/Title

  
Examiners Signature

January 8, 2016  
Date of Eye Examination







# SECTION 5

Bay 2, 3809 53<sup>rd</sup> Avenue  
Lacombe, AB  
T4L 2L6  
403.304.8314

<b><u>AIR COMPRESSOR:</u></b>	
Tag Number:	K-2231-01/02
Make:	ROTORCOMP
Model:	RS25ENC
Max. Flow Rate:	100 CM/HR @ 1310 KPA
Motor Size:	25HP, 3600 RPM
Serial Numbers:	120716-3110 & 120716-3111
<b><u>WET AIR RECEIVER:</u></b>	
Tag Number:	V-2231-03
Capacity:	120 GAL
MAWP:	2068 KPA @ 204°C
MDMT:	-20°F @ 2068 KPA
CRN:	F1166.1C
Serial Number:	400577
A#:	657436
<b><u>PRE-FILTER:</u></b>	
Tag Number:	F-2231-05
Make:	Parker
Model:	HN4S-10CN-SPECIAL PARTICULATE
MAWP:	3447 KPA
Flow Rate:	172 CM/HR @ 1310 KPA
Part #:	401198
<b><u>AIR FILTER:</u></b>	
Tag Number:	F-2231-06
Make:	Parker
Model:	HN4S-10CN-SPECIAL COALESCER
MAWP:	3447 KPA
Flow Rate:	287 CM/HR @ 1310 KPA
Part #:	401198
<b><u>HEATLESS AIR DRYER:</u></b>	
Tag Number:	D-2231-04
Make:	NORTHWEST EQUIPMENT
Model:	NW75
Max. Flow Rate:	119 CM/HR @ 1310 KPA
Serial Number:	2331696L

<b><u>DRY AIR RECEIVER:</u></b>	
Tag Number:	V-2231-07
Capacity:	240 GAL
MAWP:	2068 KPA @204°C
MDMT:	-29°C @ 1379 KPA
CRN:	F1629.123456
Serial Number:	411010
A#:	657437
<b><u>BUILDING HEATER:</u></b>	
Tag Number:	BH-2231-08
Make:	Caloritech
Model:	GE107CT480
Rating:	10kW
Voltage:	480
Phase:	3
S.O Number:	J161994
<b><u>EXHAUST FAN:</u></b>	
Tag Number:	EF-2231-09/10
Voltage:	120
Phase:	1
<b><u>AIR DRYER TOWERS:</u></b>	
Tag Number:	V-2231-02/04
Make/Model:	NORTHWEST NW75
MAWP:	2068 KPA
Max Inlet Temp:	450°F
CRN:	Y3221.2
Serial Number:	266832 & 266833
<b><u>PSV's:</u></b>	
Tag Number:	PSV-2231-01
Make:	Mercer
Model:	9100 Series
Capacity:	243 SCFM Air
Set Pressure:	1551 kPag/224 psi
CRN:	OG8841.5CR1
Serial Number:	1283840

<b><u>PSV:</u></b>	
Tag Number:	PSV-2231-02
Make:	Mercer
Model:	9100 Series
Capacity:	243 SCFM Air
Set Pressure:	1551 kPag/224 psi
CRN:	OG8841.5CR1
Serial Number:	1283841
<b><u>PSV:</u></b>	
Tag Number:	PSV-2231-03
Make:	Mercer
Model:	9100 Series
Capacity:	243 SCFM Air
Set Pressure:	1551 kPag/224 psi
CRN:	OG8841.5CR1
Serial Number:	1283842
<b><u>PSV:</u></b>	
Tag Number:	PSV-2231-07
Make:	Mercer
Model:	9100 Series
Capacity:	243 SCFM Air
Set Pressure:	1551 kPag/224 psi
CRN:	OG8841.5CR1
Serial Number:	1283843
<b><u>COOLER FAN MOTORS:</u></b>	
Make:	Global Heat Transfer
CRN:	OH 7426.21345
Serial Numbers:	1504212014 & 1504212013
<b><u>LOAF TANK:</u></b>	
Tag Number:	T-2231-01
Capacity:	379 Litres
Dimensions:	826mm Wide x 711mm High x 1245 Long



A Division of the Unified Valve Group Ltd.

MERCER VALVE CANADA  
3815 32 ST NE, CALGARY, AB, T1Y 7C1  
PH:403-215-6961

**AUTHORIZED BLUE TAG ASSEMBLER**  
**CALIBRATION REPORT**

**DATE** 1/12/2017  
**CUSTOMER:** Unified Valve Ltd  
**ADDRESS** 3815 32 Street N.E.  
Calgary, AB T1Y 7C1

**BUILD DATE** 2017-01-06  
**SERIAL NUMBER** 1283840  
**PRODUCT NUMBER** 91-17C52V06C1  
**INLET AND OUTLET** 1" MNPT X 1" FNPT "C" Orifice  
**SERIES SAFETY RELIEF VALVE** 9100  
**SET PRESSURE** 224 PSI  
**LEAK TEST** 0 Leakage at 90% of Set Pressure  
**CAPACITY** 243 SCFM AIR  
**BACK PRESSURE**  
**TEMPERATURE** 109F  
**COLD SET**  
**TRIM** STD  
**CANADIAN REGISTRATION #** 0G8841.5CR1  
**QUOTE ORDER NUMBER** 2122111  
**WORK ORDER NUMBER** 229733  
**CUSTOMER P.O. NUMBER** WH000759  
**LOCATION:**  
**CUSTOMER ID#:**  
**CUSTOMER REFERENCE:**

THE VALVES PURCHASED ON THE ABOVE WORK ORDER NUMBER WERE BUILT PER SECTION VIII, DIVISION 1 OF THE ASME BOILER AND PRESSURE VESSEL CODE.

---

CERTIFIED INDIVIDUAL  
QUALITY CONTROL



A Division of the Unified Valve Group Ltd.

MERCER VALVE CANADA  
3815 32 ST NE, CALGARY, AB, T1Y 7C1  
PH:403-215-6961

**AUTHORIZED BLUE TAG ASSEMBLER  
CALIBRATION REPORT**

**DATE** 1/12/2017  
**CUSTOMER:** Unified Valve Ltd  
**ADDRESS** 3815 32 Street N.E.  
Calgary, AB T1Y 7C1

**BUILD DATE** 2017-01-06  
**SERIAL NUMBER** 1283841  
**PRODUCT NUMBER** 91-17C52V06C1  
**INLET AND OUTLET** 1" MNPT X 1" FNPT "C" Orifice  
**SERIES SAFETY RELIEF VALVE** 9100  
**SET PRESSURE** 224 PSI  
**LEAK TEST** 0 Leakage at 90% of Set Pressure  
**CAPACITY** 243 SCFM AIR  
**BACK PRESSURE**  
**TEMPERATURE** 109F  
**COLD SET**  
**TRIM** STD  
**CANADIAN REGISTRATION #** 0G8841.5CR1  
**QUOTE ORDER NUMBER** 2122111  
**WORK ORDER NUMBER** 229733  
**CUSTOMER P.O. NUMBER** WH000759  
**LOCATION:**  
**CUSTOMER ID#:**  
**CUSTOMER REFERENCE:**

THE VALVES PURCHASED ON THE ABOVE WORK ORDER NUMBER WERE BUILT PER SECTION VIII, DIVISION 1 OF THE ASME BOILER AND PRESSURE VESSEL CODE.

**CERTIFIED INDIVIDUAL  
QUALITY CONTROL**



A Division of the Unified Valve Group Ltd.

MERCER VALVE CANADA  
3815 32 ST NE, CALGARY, AB, T1Y 7C1  
PH:403-215-6961

**AUTHORIZED BLUE TAG ASSEMBLER  
CALIBRATION REPORT**

<b>DATE</b>	1/12/2017
<b>CUSTOMER:</b>	Unified Valve Ltd
<b>ADDRESS</b>	3815 32 Street N.E. Calgary, AB T1Y 7C1
<b>BUILD DATE</b>	2017-01-06
<b>SERIAL NUMBER</b>	1283842
<b>PRODUCT NUMBER</b>	91-17C52V06C1
<b>INLET AND OUTLET</b>	1" MNPT X 1" FNPT "C" Orifice
<b>SERIES SAFETY RELIEF VALVE</b>	9100
<b>SET PRESSURE</b>	224 PSI
<b>LEAK TEST</b>	0 Leakage at 90% of Set Pressure
<b>CAPACITY</b>	243 SCFM AIR
<b>BACK PRESSURE</b>	
<b>TEMPERATURE</b>	109F
<b>COLD SET</b>	
<b>TRIM</b>	STD
<b>CANADIAN REGISTRATION #</b>	0G8841.5CR1
<b>QUOTE ORDER NUMBER</b>	2122111
<b>WORK ORDER NUMBER</b>	229733
<b>CUSTOMER P.O. NUMBER</b>	WH000759
<b>LOCATION:</b>	
<b>CUSTOMER ID#:</b>	
<b>CUSTOMER REFERENCE:</b>	

THE VALVES PURCHASED ON THE ABOVE WORK ORDER NUMBER WERE BUILT PER SECTION VIII, DIVISION 1 OF THE ASME BOILER AND PRESSURE VESSEL CODE.

**CERTIFIED INDIVIDUAL  
QUALITY CONTROL**



A Division of the Unified Valve Group Ltd.

MERCER VALVE CANADA  
3815 32 ST NE, CALGARY, AB, T1Y 7C1  
PH:403-215-6961

**AUTHORIZED BLUE TAG ASSEMBLER  
CALIBRATION REPORT**

<b>DATE</b>	1/12/2017
<b>CUSTOMER:</b>	Unified Valve Ltd
<b>ADDRESS</b>	3815 32 Street N.E. Calgary, AB T1Y 7C1
<b>BUILD DATE</b>	2017-01-06
<b>SERIAL NUMBER</b>	1283843
<b>PRODUCT NUMBER</b>	91-17C52V06C1
<b>INLET AND OUTLET</b>	1" MNPT X 1" FNPT "C" Orifice
<b>SERIES SAFETY RELIEF VALVE</b>	9100
<b>SET PRESSURE</b>	224 PSI
<b>LEAK TEST</b>	0 Leakage at 90% of Set Pressure
<b>CAPACITY</b>	243 SCFM AIR
<b>BACK PRESSURE</b>	
<b>TEMPERATURE</b>	109F
<b>COLD SET</b>	
<b>TRIM</b>	STD
<b>CANADIAN REGISTRATION #</b>	0G8841.5CR1
<b>QUOTE ORDER NUMBER</b>	2122111
<b>WORK ORDER NUMBER</b>	229733
<b>CUSTOMER P.O. NUMBER</b>	WH000759
<b>LOCATION:</b>	
<b>CUSTOMER ID#:</b>	
<b>CUSTOMER REFERENCE:</b>	

THE VALVES PURCHASED ON THE ABOVE WORK ORDER NUMBER WERE BUILT PER SECTION VIII, DIVISION 1 OF THE ASME BOILER AND PRESSURE VESSEL CODE.

**CERTIFIED INDIVIDUAL  
QUALITY CONTROL**



Company Name \_\_\_\_\_

### Rotary Screw Compressor Installation Sheet

Date of Installation \_\_\_\_\_ Compressor Model# \_\_\_\_\_

Installation Company \_\_\_\_\_ Compressor Serial # \_\_\_\_\_

Installation Technician \_\_\_\_\_ Compressor Voltage \_\_\_\_\_

Site Electrical Phase \_\_\_\_\_

Site Voltage \_\_\_\_\_

Compressor Electrical breaker size \_\_\_\_\_

Incoming Voltage at motor start up \_\_\_\_\_

Incoming Voltage at max operating pressure \_\_\_\_\_

Incoming power connected to Magnetic Starter \_\_\_\_\_

Compressor Rotation Correct \_\_\_\_\_

Motor amps at Max operating Pressure \_\_\_\_\_

Compressor Max Operating Pressure \_\_\_\_\_

Compressor tank drain functional \_\_\_\_\_

Unit inspected for Air leaks \_\_\_\_\_

Unit inspected for Oil leaks \_\_\_\_\_

Unit location:  Indoors  Outdoors (Put N/A if pressure not applicable to installed unit)

Unit tank fill time 0-125psi \_\_\_\_\_

Unit tank fill time 0-150psi \_\_\_\_\_

Unit tank fill time 0-175psi \_\_\_\_\_

Unit Cooling Fan (Pulls air through cooler) (Push's air through cooler)

Compressor Temperature switch reading (Before install) \_\_\_\_\_ (After install) \_\_\_\_\_

Unit unloads at max operating pressure and begins to release sump pressure \_\_\_\_\_

Belt tension checked \_\_\_\_\_

Vibration Pads properly installed \_\_\_\_\_

**INDUSTRIAL GOLD**

**800-742-3071**

**MODEL: SR253ENC62 - CRNNY AIREND: EV03**

**SERIAL: 120716 - 3110 MOTOR: LEESON**

**OPERATING PRESS: 190 PSI**

**PUMP OIL: RS8000**

**VOLTAGE: 460 - 480V 3P**

Company Name \_\_\_\_\_

**Rotary Screw Compressor Installation Sheet**

Date of Installation \_\_\_\_\_ Compressor Model# \_\_\_\_\_

Installation Company \_\_\_\_\_ Compressor Serial # \_\_\_\_\_

Installation Technician \_\_\_\_\_ Compressor Voltage \_\_\_\_\_

Site Electrical Phase \_\_\_\_\_

Site Voltage \_\_\_\_\_

Compressor Electrical breaker size \_\_\_\_\_

Incoming Voltage at motor start up \_\_\_\_\_

Incoming Voltage at max operating pressure \_\_\_\_\_

Incoming power connected to Magnetic Starter \_\_\_\_\_

Compressor Rotation Correct \_\_\_\_\_

Motor amps at Max operating Pressure \_\_\_\_\_

Compressor Max Operating Pressure \_\_\_\_\_

Compressor tank drain functional \_\_\_\_\_

Unit inspected for Air leaks \_\_\_\_\_

Unit inspected for Oil leaks \_\_\_\_\_

Unit location:  Indoors  Outdoors (Put N/A if pressure not applicable to installed unit)

Unit tank fill time 0-125psi \_\_\_\_\_

Unit tank fill time 0-150psi \_\_\_\_\_

Unit tank fill time 0-175psi \_\_\_\_\_

Unit Cooling Fan (Pulls air through cooler) (Push's air through cooler)

Compressor Temperature switch reading (Before install) \_\_\_\_\_ (After install) \_\_\_\_\_

Unit unloads at max operating pressure and begins to release sump pressure \_\_\_\_\_

Belt tension checked \_\_\_\_\_

Vibration Pads properly installed \_\_\_\_\_

**INDUSTRIAL GOLD**  
**800 - 742 - 3071**  
**MODEL: SR253ENC62 - CRNNY AIREND: EV03**  
**SERIAL: 120716 - 3111 MOTOR: LEESON**  
**OPERATING PRESS: 190 PSI**  
**PUMP OIL: RS8000**  
**VOLTAGE: 460 - 480V 3P**

## MATERIAL RECEIVING REPORT

ENVISION MANUFACTURING & SUPPLY LTD.  
 QUALITY CONTROL MANUAL

Material Tracking No.	Verified Thickness/ Product	Diameter	QTY	Record Of Actual Code Required Markings <small>(Note: The markings required by the material specification are described in the material specification and the general specification for the product form)</small>	Supplier	PO#	Heat #	Checked By
N/A	0.145"	2"	1	FLANGE RFWN 2-150CL STD A350-LF2 CS (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D2	A93V4	TMcD
N/A	3000CL	2"	1	UNION 2 3000CL THRD X SW A105-N (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D2	E1	TMcD
N/A	0.145"	2"	20	PIPE STD 2 SEAMLESS CARBON STEEL A333 GR 6 (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D2	1523216V	TMcD
N/A	0.179"/0.154"	1" X 3/4"	8	SWAGE XH 1 X 3/4 TBE CARBON STEEL A234 (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D	W02257ZZ	TMcD
N/A	0.179"/0.147"	1" X 1/2"	10	SWAGE XH 1 X 1/2 TBE CARBON STEEL A234 (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D	W22243ZE	TMcD
N/A	0.218"/0.179"	2" X 1"	7	SWAGE XH 2 X 1 TBE CARBON STEEL A234 (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D	W02999ZC	TMcD
N/A	0.200"/0.179"	1-1/2" X 1"	3	SWAGE XH 1-1/2 X 1 TBE CARBON STEEL A234 (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D	W22272ZE	TMcD
N/A	0.147"/0.119"	1/2" X 1/4"	10	SWAGE XH 1/2 X 1/4 TBE CARBON STEEL A234 (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D	W22234ZE	TMcD
N/A	0.147"/0.095"	1/2" X 1/8"	5	SWAGE XH 1/2 X 1/8 TBE CARBON STEEL A234 (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D	W00172	TMcD
N/A	0.126"/0.095"	3/8" X 1/8"	5	SWAGE XH 3/8 X 1/8 TBE CARBON STEEL A234 (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D	ADDD	TMcD
N/A	3000CL	1"	16	UNION HEX 3000CL 1 THREADED FORGED STEEL A105N BLACK (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D	6965	TMcD
N/A	3000CL	1/2"	12	PLUG HEX HEAD 1/2 THREADED FORGED STEEL A105N (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D	K525	TMcD
N/A	3000CL	1"	12	PLUG HEX HEAD 1 THREADED FORGED STEEL A105N (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D	K603	TMcD
N/A	3000CL	3/8"	5	PLUG HEX HEAD 3/8" THREADED FORGED STEEL A105N (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D	NK	TMcD
N/A	3000CL	1"	8	COUPLING 3000CL 1 THREADED FORGED CARBON STEEL A105N BLACK (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D	181M	TMcD
N/A	3000CL	1/2"	5	COUPLING 3000CL 1/2 THREADED FORGED STEEL CARBON STEEL A105N (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D	JBLF	TMcD
N/A	3000CL	1/2"	12	ELBOW 3000CL 1/2 90 DEGREE THREADED FORGED STEEL A105N BLACK (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D	JTLT	TMcD
N/A	3000CL	1"	30	ELBOW 3000CL 1 90 DEGREE THREADED FORGED STEEL A105N BLACK (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D	70H	TMcD
N/A	3000CL	2"	8	ELBOW 3000CL 2 90 DEGREE THREADED FORGED STEEL A105N BLACK (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D	1ASN	TMcD
N/A	0.218"	2"	10	NIPPLE XH 2 X 2-1/2 TBE SEAMLESS CARBON STEEL A106B (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D	867K	TMcD
N/A	0.179"	1"	5	NIPPLE XH 1 X 4 TBE SEAMLESS CARBON STEEL A106B (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D	86BC	TMcD
N/A	3000CL	1"	15	TEE 3000CL 1 THREADED FORGED STEEL A105N BLACK (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D	4309	TMcD
N/A	3000CL	1/2"	10	TEE 3000CL 1/2 THREADED FORGED STEEL A105N BLACK (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D	TE7	TMcD
N/A	0.179"/0.119"	1" X 1/4"	10	SWAGE XH 1 X 1/4 TBE CARBON STEEL A234 (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D	W22242ZE	TMcD
N/A	0.218"	2"	8	NIPPLE XH 2 X 3-1/2 TBE SEAMLESS CARBON STEEL A106B (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D	84U3	TMcD
N/A	3000CL	1/4"	15	ELBOW 3000CL 1/4 90 DEGREE THREADED FORGED STEEL A105N BLACK (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D	4235	TMcD

### MATERIAL RECEIVING REPORT

Material Tracking No.	Verified Thickness/ Product	Diameter	QTY	Record Of Actual Code Required Markings	Supplier	PO#	Heat #	Checked By
				(Note: The markings required by the material specification are described in the material specification and the general specification for the product form)				
N/A	3000CL	1"	10	ELBOW 3000CL 1 90 DEGREE THREADED FORGED STEEL A350-LF2 (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D	H5	TMcD
N/A	3000CL	1-1/2"	5	ELBOW 3000CL 1-1/2 90 DEGREE THREADED FORGED STEEL A105N BLACK (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D	VNFC	TMcD
N/A	0.179"	1"	60	PIPE XH 1 SEAMLESS CARBON STEEL A106 GR B (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D	1314438	TMcD
N/A	0.179"	1"	20	PIPE XH 1 SEAMLESS CARBON STEEL A333 GR 6 (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D	015100427	TMcD
N/A	0.147"	1/2"	20	PIPE XH 1/2 SEAMLESS CARBON STEEL A106 GR B (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D	W11409489	TMcD
N/A	0.218"	2"	4	NIPPLE XH 2 X 4 TBE SEAMLESS CARBON STEEL A106B (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D	86BA	TMcD
N/A	0.218"	2"	4	NIPPLE XH 2 X 5 TBE SEAMLESS CARBON STEEL A106B (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D	84XZ	TMcD
N/A	0.179"	1"	5	NIPPLE XH 1 X 2-1/2 TBE SEAMLESS CARONB STEEL A106B (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D	84LR	TMcD
N/A	0.179"	1"	5	NIPPLE XH 1 X 3-1/2 TBE SEAMLESS CARBON STEEL A106B (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D	868N	TMcD
N/A	0.179"	1"	5	NIPPLE XH 1 X 4 TBE SEAMLESS CARBON STEEL A106B (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D	86BC	TMcD
N/A	0.179"	1"	5	NIPPLE XH 1 X 5 TBE SEAMLESS CARBON STEEL A106B (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D	869F	TMcD
N/A	0.179"	1"	5	NIPPLE XH 1 X 6 TBE SEAMLESS CARBON STEEL A106B (SEE MTR FOR ADDITIONAL INFO)	DNOW	16182-D	84LR	TMcD
N/A	3000CL	1"	4	ELBOW 3000CL 1 45 DEGREE THREADED FORGED STEEL A105N BLACK (SEE MTR FOR ADDITIONAL INFO)	PREMIER PROJECT SUPPLY	TOM	4037	TMcD

CLIENTE / Customer

DNOW CANADA ULC  
P.O. BOX 4395 STATION C  
CALGARY, ALBERTA  
CANADA T2T 5N2

**CERTIFICADO DE INSPECCION**  
Inspection Certificate - Certificat de Réception

DIN EN 10204 / 3.1  
ISO 10474 / 3.1



FECHA: 24/11/2014 N.º 168535

HOJA: 3

SGI 1922164

SGI 6000236

SGI 6009987

ULMA FORJA, S.COOP.

Management Systems certified by LRQAE

PRODUCTO FLANGES  
Article - Produit

SU PEDIDO N.º 3364006-OR-2100  
Your Order No.  
Votre Cde. N.º

DE 14/02/2014  
of. - de

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

Bº Zubillaga, 3 - Apdo. 14  
20560 ONATI (Gipuzkoa) SPAIN  
Tel.: 34 - 943 780552  
Fax: 34 - 943 781808  
E-mail: ulma@ulmapiping.com

NORMAS APLICABLES ASME B16.5-13  
Requirements - Normes Applicables

MATERIAL CORRESPONDIENTE ASME SA350LF2CL1-13, ASTM A350LF2CL1-13  
Material Correspondent - Qualité

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

NACE MR0175/ISO15156-02-09 & MR0103-12  
Clause 7.2.1.4, Annex A.2 and SSC Region 3.  
CSA-Z245.12-13 GR290 CAT II -SS (WN & BLIND FLANGES ONLY)

MARCA DEL FABRICANTE  
Mark of factory  
Marque du fabricant



Packing List: 113141

DEPARTAMENTO QUALITY ASSURANCE  
Section  
Département

PARTIDA Item Poste	CANTIDAD Quantity Quantité	DESCRIPCION Description Description	LOTE	OBSERVACIONES Remarks Observations (*)	COLADA N.º Heat No N.ºCoulée	RESISTENCIA T.Strength Resist Rupt N/mm2	LIMITE ELAST. Y.Strength 0.2 % N/mm2	ALARGAM. Elongation Allongement Lo: 4 d %	ESTRICCION Red. Area Striction %	RESILIENCIA Impact test Résilience Joules			PROBETA - SPECIMEN CHARPY V 10x10mm		DUREZA Hardness Dreté HBW
										54	66	59	MEDIA Average Moyenne	°C	
45 1790147	8	BLIND 2 600LB RF A350LF2 V02 TAL.1 NPT		NE	C28V3	524	328	29,70	56,90	54	66	59	60	-50	156 163
66 1564289	20	BLIND 2 1500LB RTJ A350LF2 V01 AG/CENT 1 NPT		NE	C36V3	525	325	33,80	68,10	69	57	64	63	-50	163 172
129 1076091	454	WN 2 150LB STD/40 RF A350LF2		NE	A93V4	517	323	29,20	50,80	60	53	50	54	-50	148 160
135 1076162	21	WN 12 150LB STD RF A350LF2		NE	B26V4	508	315	30,40	53,80	50	49	53	51	-50	150 152
135 1076162	30	WN 12 150LB STD RF A350LF2		NE	B63V4	510	313	29,20	52,90	66	65	55	62	-50	150 155
157 1076197	9	WN 12 300LB STD RF A350LF2		NE	A8VV4	505	325	30,50	50,40	56	55	65	59	-50	149 155
157 1076197	2	WN 12 300LB STD RF A350LF2		NE	B26V4	508	315	30,40	53,80	50	49	53	51	-50	150 152
158 1076525	21	WN 2 300LB XS/80 RF A350LF2		NE	B15V4	518	310	29,80	50,70	57	55	62	58	-50	157 160
158 1076525	128	WN 2 300LB XS/80 RF A350LF2		NE	B29V4	520	318	30,50	52,80	67	63	51	60	-50	155 150

COLADA N.º Heat No N.ºCoulée	COMPOSICION QUIMICA - STEEL MAKER'S LADLE ANALYSIS - ANALYSE CHIMIQUE													
	C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	Nb %	V %	Cu %	Al %	Ti %	CEq %
A8VV4	0,180	0,300	1,030	0,014	0,003	0,090	0,130	0,020	0,002	0,001	0,260	0,034	0,000	0,400
A93V4	0,195	0,200	0,983	0,015	0,009	0,115	0,094	0,018	0,000	0,002	0,199	0,015	0,000	0,405
B15V4	0,190	0,230	0,980	0,009	0,006	0,050	0,080	0,013	0,007	0,001	0,190	0,020	0,000	0,384
B26V4	0,210	0,240	1,010	0,015	0,005	0,080	0,070	0,010	0,005	0,002	0,160	0,034	0,000	0,412
B29V4	0,200	0,190	1,020	0,011	0,007	0,070	0,070	0,011	0,001	0,002	0,180	0,024	0,000	0,403
B63V4	0,190	0,200	1,050	0,015	0,007	0,050	0,100	0,014	0,004	0,001	0,190	0,031	0,000	0,397
C28V3	0,190	0,230	1,020	0,011	0,002	0,061	0,087	0,032	0,001	0,002	0,290	0,030	0,000	0,404
C36V3	0,190	0,260	1,080	0,007	0,005	0,060	0,080	0,015	0,005	0,001	0,210	0,024	0,000	0,405

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

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

EL INSPECTOR  
Works Inspector - L'Inspecteur



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



(\*) OBSERVACIONES:  
Remarks  
Observations  
N\_NORMALIZED AT 900 C AND ALLOWED TO COOL IN STILL AIR.

16182-D2  
Dec 15/16  
Ulma

Heat#: E1

2 3000 SCR D UNION A105N MACH TO SW/THRD

DELCORTE s.r.l.s  
 FORGED STEEL & STAINLESS STEEL  
 Quality system certified ISO9001:2008 by BSI-Q05524

17, Avenue du Corbeau - BP 697  
 69505 MAUBEUGE CEDEX FRANCE  
 Tél : +33 (0)327 691 414 Fax : +33 (0)327 642 569  
 info@delcora.com

CERTIFICAT DE RECEPTION - ACCEPTANCE CERTIFICATE EN 10204 3.1 (Ex EN 10204 3.1.2)

Customer: ... Order: 5763.10/01-838

Certificate n°: 182059 / 6 23/07/2010 Dispatch note 182059 22/07/2010

Material specification ASME/07 - ASTM/05 SAJ/A105 - CONFORMITY NACE MR 0175-03  
 Heat Treatment NORMALIZED T° 843-877 - COOLED IN STILLAIR

DESCRIPTION

Item	Qty	Description	Heat #	Identification	Spec dimension	Location
28	400	TEE SW 3000 3/4"	3239307	A182	ASME B16.11/05	09/00 23200
31	400	BUSHING NPT 3/80001"X3/4"	42044	BKC	ASME B16.11/05	09/01 4585
32	378	HALF CPLG NPT 3000 2"	54443	MC2	ASME B16.11/05	07/00 21768
38	124	TEE NPT 3000 1"	9702289	A184	ASME B16.11/05	05/00 22898
38	120	TEE NPT 3000 1"	9702289	A184	ASME B16.11/05	05/00 22859
38	66	TEE NPT 3000 1"	9702289	A184	ASME B16.11/05	05/00 22859
37	300	CPLG NPT 3000 2"	61681	MRM	ASME B16.11/05	02/10 23743
38	250	45 ELBOW NPT 3000 1/2"	2292983	A149	ASME B16.11/05	12/00 22358
40	200	90 ELBOW NPT 3000 1/4"	04853	A117	ASME B16.11/05	10/00 21173
43	200	FF UNION SW 3M 3/4"	AEB438	AO	BS 3799/74	03/00 23329
45	200	COUPLING SW 3000 1"	34471	CSP	ASME B16.11/05	09/04 6111
46	200	HALF CPLG NPT 3000 1"	47861	LTC	ASME B16.11/05	08/07 20338
48	200	FF UNION NPT 3000 1"1/2	38394	DB	BS 3799/74	04/00 21469
49	200	FF UNION NPT 3000 1"	38392	E1	BS 3799/74	03/00 22932
51	150	BUSHING NPT 3/80001/2"X1/4"	C39298	AAD	ASME B16.11/05	02/03 2048
53	160	90 ELBOW SW 3000 1"1/4"	6707328	A144	ASME B16.11/05	12/00 22230

CHEMICAL ANALYSIS

Item	Identif.	C%	Si%	Mn%	P%	S%	Cr%	Mo%	V%	Ni%	Cu%	Co%	Ca%	Cr+Mo	Cr+Ni+Cr+Mo
28	A182	0.190	0.230	0.980	0.012	0.011	0.080	0.018	0.008	0.020	0.120	0.001	0.47	0.320	1.000
31	BKC	0.160	0.200	0.770	0.014	0.004	0.120	0.040	< 0.010	0.120	0.218	< 0.010	0.34	0.160	0.216
32	MC2	0.160	0.200	1.940	0.016	0.028	0.130	0.050	= 0.000	0.070	0.160	= 0.000	0.40	0.180	0.400
38	A184	0.200	0.250	0.980	0.016	0.008	0.080	0.013	0.004	0.040	0.120	0.003	0.40	0.093	0.233
38	A184	0.200	0.250	0.980	0.015	0.005	0.080	0.013	0.004	0.040	0.120	0.003	0.40	0.093	0.233
38	A184	0.200	0.250	0.980	0.015	0.005	0.080	0.013	0.004	0.040	0.120	0.003	0.40	0.093	0.233
37	MRM	0.170	0.230	1.080	0.013	0.032	0.100	0.040	= 0.000	0.070	0.100	= 0.000	0.30	0.140	0.310
38	A149	0.190	0.240	0.950	0.013	0.011	0.110	0.013	0.008	0.050	0.100	0.009	0.38	0.123	0.273
40	A117	0.190	0.220	0.950	0.016	0.013	0.040	0.008	0.002	0.010	0.030	0.002	0.38	0.048	0.098
43	AO	0.180	0.260	1.000	0.016	0.023	0.180	0.030	0.022	0.080	0.120	0.006	0.40	0.220	0.430
45	CSP	0.180	0.230	1.180	0.017	0.017	0.160	0.010	0.028	0.080	0.200	0.008	0.43	0.160	0.430
46	LTC	0.180	0.230	1.050	0.013	0.023	0.200	0.080	= 0.000	0.090	0.130	= 0.000	0.43	0.260	0.480
48	DB	0.200	0.280	0.780	0.010	0.004	0.070	0.030	= 0.000	0.140	0.250	0.004	0.38	0.100	0.480
49	E1	0.180	0.170	0.760	0.012	0.015	0.070	0.020	= 0.000	0.010	0.200	0.004	0.34	0.090	0.300
51	AAD	0.190	0.120	0.800	0.013	0.038	0.180	0.020	0.001	0.110	0.200	0.001	0.40	0.200	0.510
53	A144	0.190	0.250	0.970	0.003	0.003	0.080	0.017	0.008	0.040	0.080	0.002	0.38	0.087	0.187

MECHANICAL TESTS

Item	Identif.	Re 0.2% N/mm²	Rm N/mm²	A%	Z%	HB
28	A182	342.0	634.0	32.0	68.9	143 - 144
31	BKC	623.0	894.0	28.5	83.0	172 - 178
32	MC2	290.0	487.0	28.0	82.0	140 - 143
38	A184	288.0	408.0	33.8	68.1	148 - 147
38	A184	288.0	405.0	33.8	68.1	148 - 147
38	A184	288.0	406.0	33.8	68.1	148 - 147
37	MRM	316.0	411.0	37.0	68.0	163 - 163
38	A149	363.0	629.0	33.1	62.4	148 - 144
40	A117	529.0	631.0	32.8	63.0	143 - 148
43	AO	374.0	635.0	25.0	49.0	179 - 182
45	CSP	391.3	643.2	23.4	63.8	160 - 162
46	LTC	336.0	620.0	31.0	69.0	149 - 148
48	DB	348.0	612.0	29.7	64.8	147 - 152
49	E1	335.0	518.0	38.1	65.3	140 - 141
51	AAD	412.0	642.0	28.0	66.0	171 - 172
53	A144	316.0	616.0	34.4	68.6	144 - 142

VISA D'Arrivée  
 le 28/09/10  
  
 Service AQ

Nous certifions que les produits énumérés ci-dessous sont conformes aux prescriptions de la commande et des spécifications et ont subi, sans objection, les contrôles d'aspect et de dimensions.  
 We hereby certify that above mentioned products are in accordance with the requirements of the order and specifications and have been checked without objection for surface and dimensional control.

Service département  
  
 Référence DELCORTE 2007/07/14 71

**Intertek**  
 Reviewed  
 Witnessed  
 Initial: *JP*  
 Date: 01/09/17  
 CA - 0077

Po#16182-D2  
 Dec 5/16  
*uncap*

**HENGYANG VALIN  
STEEL TUBE CO.,LTD**

**MILL TEST REPORT**

Add: 10 Dalixincun, Hengyang City, Hunan, P.R. China P.C.:421001

Tel and Fax: +86 734 8873739

E-mail: hsiiec@hysteeltube.com

(ACCORDING TO EN10204 3.1)

CUSTOMER	DNOV CANADA ULC		CERTIFICATE NO.	C201523506-1	
CONTRACT NO.	2111001708	P.O.NO.	PO.25455139 (LOT A)	L/C NO.:	5FAHD5-00439
PRODUCT	SEAMLESS CARBON STEEL PIPE FOR OIL AND GAS USE.			DATE:	2015-7-24
SPECIFICATION	SEE SPECIFICATION NOTE		HEAT TREATMENT	NR	
GRADE	BN/X42N,GR.6,GR.290		DIMENSIONS	2"*0.154"*20FT	
TOTAL BUNDLES:	4	TOTAL PIECES:	149	TOTAL LENGTH:	2981.96 ft
				TOTAL WEIGHT:	4.945 mt

NO.	BATCH No.	HEAT No.	BUNDLES	PIECES	LENGTH ft	WEIGHT mt	TENSILE TEST ASTM A370						FLATTENING TEST
							SAMPLE TYPE/ ORIENTATION / SIZE(mm)/GAUGE LENGTH(mm):SL19/50						
							TS(psi)	YS(psi)	RT0.5	EL(%)	R.A. (%)	YS/TS	
1	9E6182140	1523216V	4	149	2981.96	4.945	76560/76850	58725/59305		32.0/30.5		0.77/0.77	ACCEPTABLE

NO.	IMPACT TEST								NON METALIC INCLUSION	GRAIN SIZE	HARDNESS TEST	
	NOTCH TYPE/ORIENTATION/TEMPERATURE(°C)/SIZE (mm) :										NACE MR0175/ISO 15156-2 (REGION 3)/MR0103	
	///				///						HV10	
AK1 (J)		Av.(J)	% SHEAR AREA	LE	AK2 (J)		Av.(J)	% SHEAR AREA	LE			
1	/				/					163.7/171.7////////		

NOTES:

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

16182-D2  
Dec 15/16  
[Signature]



HENGYANG VALIN  
STEEL TUBE CO.,LTD

# MILL TEST REPORT

Add: 10 Dalixincun, Hengyang City, Hunan, P.R. China P.C.:421001

Tel and Fax: +86 734 8873739

E-mail: hsiiec@hysteeltube.com

(ACCORDING TO EN10204 3.1)

CUSTOMER	DNOV CANADA ULC		CERTIFICATE NO.	C201523506-1	
CONTRACT NO.	2111001708	P.O.NO.	PO.25455139 (LOT A)	L/C NO.:	5FAHDS-00439
PRODUCT	SEAMLESS CARBON STEEL PIPE FOR OIL AND GAS USE.			DELIVERY CONDITION	NR
SPECIFICATION	SEE SPECIFICATION NOTE		HEAT TREATMENT		
GRADE	BN/X42N,GR.6,GR.290			DIMENSIONS	2"*0.154"*20FT
TOTAL BUNDLES:	4	TOTAL PIECES:	149	TOTAL LENGTH:	2981.96 ft
			TOTAL WEIGHT:	4.945 mt	

NO	HEAT No. BATCH No.	Type	CHEMICAL COMPOSITION (%)																																		
			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					
		P	*100											*1000											*10000		*100		*1000								
1	1523216V	H	11	34	132	65	25	22	44	21	12						8	13				24	41	1		35	159.1	12.1	25.1	1.0	4.2	12.0					
	9E6182140	P	11	33	135	66	25	21	44	20	13					13	12				21	76	1		36	162.6	20.6	32.6	1.0	5.6	12.3						
	9E6182140	P	11	33	135	67	27	22	44	20	13					14	12				21	76	1		36	165.6	21.6	33.6	1.1	5.6	12.3						
		H																																			
		P																																			
		P																																			
		H																																			
		P																																			
		P																																			
		H																																			
		P																																			
		P																																			

NON-DESTRUCTIVE TEST			
POSITION	PIPE BODY	PIPE END	END SURFACE(GROOVE)
NDT Type(Level)	EMI/L2	UT/L2	
LAMINAR			
TEST RESULT	ACCEPTABLE	ACCEPTABLE	N/A
RESIDUAL MAGNETISM	≤20 GS	ACCEPTABLE	COATING
UT THICKNESS MEASUREMENT		N/A	
HYDROSTATIC TEST	Min(psi/s)	3000/6	ACCEPTABLE

NOTES: H--HEAT ANALYSIS P--PRODUCT ANALYSIS CE--EQUIVALENT CARBON R--RATIO R1=Ca /S R2=Al /N R3=Mn /C  
 CEIIW=C+Mn/6+(Cr+Mo+V)/5+(Cu+Ni)/15 CEPCM=C+Si/30+(Mn+Cr+Cu)/20+Ni/60+Mo/15+V/10+5\*B SUM1=Cr+Cu+Mo+Ni+V SUM2=Nb+V SUM3=Nb+V+Ti  
 ET-ISO10893-2-2011, UT-ISO10893-10-2011, MPI-ISO10893-5-2011, EMI-ISO10893-3-2011, WT-ISO10893-12-2011, LaminationT-ISO-10893-8-2011  
 L4/L3/L2--ACCEPT LEVEL L4/L3/L2,NOTCH DEPTH IS 12.5%/10%/5% THE SPECIFIED WALL THICKNESS.

16182-D2  
Dec 15/10  
Jueo



HENGYANG VALIN  
STEEL TUBE CO.,LTD

# MILL TEST REPORT

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

CUSTOMER		DNOV CANADA ULC		(ACCORDING TO EN10204 3.1)	
CONTRACT NO.	2111001708	P.O.NO.	PO.25455139 (LOT A)	CERTIFICATE NO.	C201523506-1
PRODUCT	SEAMLESS CARBON STEEL PIPE FOR OIL AND GAS USE.			L/C NO.:	5FAHD5-00439
SPECIFICATION	SEE SPECIFICATION NOTE	HEAT TREATMENT	DELIVERY CONDITION		
GRADE	BN/X42N, GR.6, GR.290		NR		
TOTAL BUNDLES:	4	TOTAL PIECES:	149	TOTAL LENGTH:	2981.96 ft
				DIMENSIONS	2"*0.154"*20FT
				TOTAL WEIGHT:	4.945 mt
		REMARK : 1.ORIGIN :MADE IN CHINA;2.ALL ELEMENTS TO BE LISTED			

SPECIFICATION NOTE	ASTM A333 Gr.6-2013, ASME SA333 Gr.6-2013, API 5L Gr.BN/X42N PSL-2 45TH EDITION, NACE MR-0175-2011/ISO 15156-2(REGION 3)-2009/MR-0103-2012/SS (CSA Z245.1 GRADE 290 CATEGORY II-2014)
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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: hsiicc@hysteeltube.com

CUSTOMER THIRD PARTY

Quality Manager: 

Certificate-maker: 刘军芳

16182-D2  
Dec 15/16  


# WESTBROOK

## MATERIAL TEST REPORT

PO Box 53591  
Edmonton, AB T6X0P0

Voice 780-490-4976  
Fax 780 490 0471

Order No.: 137187      Order Date: 9/28/2016

Purchase Order: 25638820-AB01

Printed: 9/28/2016

Line: 5      Description: **1 X 3/4 S80 A234WPBN SP95 BLK CONC SWG TBE**

\*\*\*\*\* Specifications - Heat Code      W22217 EW: \*\*\*\*\*  
A105/A105M-14, SA105, A234-14 WPB, SA234 WPB, ASME B16.5,  
B16.9, B16.11, B16.36, B1.20.1, MSS SP-25, SP-44, SP-79,  
SP-83, SP-95, API-605, A.W.W.A.  
STARTING MATERIAL: BAR/BILLET/FORGING  
A234-14 WPBN, SA234 WPBN

**Chemical Composition:**

C:	Mn:	P:	S:	Si:	Cr:	Ni:	Mo:
0.270	0.790	0.020	0.007	0.210	0.020	0.010	0.030
Cu:	V:	Cb:	C.E.:				
0.010	0.003	0.015	.413				

**Mechanical Properties:**

Tensile(PSI):	Yield(PSI):	Elong(%):	RA(%):	Hardness:
73244	46412	33.50	59.50	HRB 72-76.

**Comments:**

Normalized @ 1600F for 10-15 minutes then still air cooled.  
Cold Drawn  
Meets Nace MR-01-75/2009, MR-01-03/2010 and ISO 15156/2009.

\*\*\*\*\* Specifications - Heat Code      W02257 ZZ: \*\*\*\*\*  
A105/A105M-13, SA105, A234-13 WPB, SA234 WPB, ASME B16.5,  
B16.9, B16.11, B16.36, B1.20.1, MSS SP-25, SP-44, SP-79,  
SP-83, SP-95, API-605, A.W.W.A.  
STARTING MATERIAL: BAR/BILLET/FORGING  
A234-13 WPBN, SA234 WPBN

**Chemical Composition:**

C:	Mn:	P:	S:	Si:	Cr:	Ni:	Mo:
0.200	0.960	0.009	0.004	0.210	0.080	0.320	0.010
Cu:	V:	Al:	Cb:	C.E.:			
0.080	0.010	0.030	0.000	.406			

**Mechanical Properties:**

Tensile(PSI):	Yield(PSI):	Elong(%):	RA(%):	Hardness:
76000	51500	32.00	71.00	BHN 147-148

**Comments:**

Normalized.  
Cold drawn.  
Meets Nace MR-01-75/2009, MR-01-03/2010 and ISO 15156/2009.



PO# 16182-D  
Dec 15/16  
Suave.

We hereby certify that the contents of this Material Test Report are correct and accurate to the best of our knowledge and belief, that all test results are in compliance with the material specifications and that all material meets the dimensional requirements of the order. The products described have not come into contact with mercury or any of its components. Westbrook's USA Quality System is registered to ISO 9001, Certificate No. 32813. This document is in accordance with EN10204:2004 3.1 / DIN50049 3.1B and was electronically transmitted. This inspection certificate is issued under the authority of Westbrook Mfg's Quality Control Manager.

# WESTBROOK

## MATERIAL TEST REPORT

PO Box 53591  
Edmonton, AB T6X0P0

Voice 780-490-4976  
Fax 780 490 0471

To: **DNOW CANADA ULC**  
Order No.: **136964** Order Date: **9/20/2016**

Purchase Order: **25636622-AB01**

Printed: **9/22/2016**

Line: **Description:**  
**16 1 X 1/2 S80 A234WPBN SP95 BLK CONC SWG**  
**TBE**

\*\*\*\*\* Specifications - Heat Code **W22243 ZE: \*\*\*\*\***  
A105/A105M-14, SA105, A234-14 WPB, SA234 WPB, ASME B16.5,  
B16.9, B16.11, B16.36, B1.20.1, MSS SP-25, SP-44, SP-79,  
SP-83, SP-95, API-605, A.W.W.A.  
STARTING MATERIAL: BAR/BILLET/FORGING  
A234-14 WPBN, SA234 WPBN

### Chemical Composition:

C:	Mn:	P:	S:	Si:	Cr:	Ni:	Mo:
0.190	0.830	0.021	0.006	0.260	0.110	0.060	0.020
Cu:	V:	Cb:	C.E.:				
0.100	0.004	0.015	.365				

### Mechanical Properties:

Tensile(PSI):	Yield(PSI):	Elong(%):	RA(%):	Hardness:
71069	44962	24.00	60.00	HRB 71-73.

### Comments:

Normalized 1600F for 10-15 minutes then still air cooled.  
Cold drawn.  
Meets Nace MR-01-75/2009, MR-01-03/2010, and ISO 15156/2009.

Line: **Description:**  
**17 1 X 1/4 S80 A234WPBN SP95 BLK CONC SWG**  
**TBE**

\* Specifications - Heat Code **W22199 ZE: \*\*\*\*\***  
A105/A105M-13, SA105, A234-13 WPB, SA234 WPB, ASME B16.5,  
B16.9, B16.11, B16.36, B1.20.1, MSS SP-25, SP-44, SP-79,  
SP-83, SP-95, API-605, A.W.W.A.  
STARTING MATERIAL: BAR/BILLET/FORGING  
A234-13 WPBN, SA234 WPBN

### Chemical Composition:

C:	Mn:	P:	S:	Si:	Cr:	Ni:	Mo:
0.270	0.790	0.020	0.007	0.210	0.020	0.010	0.030
Cu:	V:	Cb:	C.E.:				
0.010	0.004	0.007	.413				

### Mechanical Properties:

Tensile(PSI):	Yield(PSI):	Elong(%):	RA(%):	Hardness:
73244	44962	33.00	58.00	HRB 68-69.

### Comments:

Normalized at 1600F for 10-15 minutes then still air cooled.  
Cold drawn.  
Meets Nace MR-01-75/2009, MR-01-03/2010 and ISO 15156/2009.



*PO# 16182-D*  
*Dec 15/16*  
*JCS*

We hereby certify that the contents of this Material Test Report are correct and accurate to the best of our knowledge and belief, that all test results are in compliance with the material specifications and that all material meets the dimensional requirements of the order. The products described have not come into contact with mercury or any of its components. Westbrook's USA Quality System is registered to ISO 9001, Certificate No. 32813. This document is in accordance with EN10204:2004 3.1 / DIN50049 3.1B and was electronically transmitted. This inspection certificate is issued under the authority of Westbrook Mfg's Quality Control Manager.

# WESTBROOK

# MATERIAL TEST REPORT

PO Box 53591  
Edmonton, AB T6X0P0

Voice 780-490-4976  
Fax 780 490 0471

To: **DNOW CANADA ULC**  
Order No.: **137187** Order Date: **9/28/2016**

Purchase Order: **25638820-AB01**

Printed: **9/28/2016**

\*\*\*\*\* Specifications - Heat Code **W01752 ZZ: \*\*\*\*\***  
A105/A105M-11, SA105, A234-11 WPB, SA234 WPB, ASME B16.5,  
B16.9, B16.11, B16.36, B1.20.1, MSS SP-25, SP-44, SP-79,  
SP-83, SP-95, API-605, A.W.W.A.  
STARTING MATERIAL: BAR/BILLET/FORGING  
A234-07 WPBN, SA234 WPBN

### Chemical Composition:

C:	Mn:	P:	S:	Si:	Cr:	Ni:	Mo:
0.180	0.990	0.011	0.009	0.200	0.060	0.290	0.020
Cu:	V:	Al:	Cb:	C.E.:			
0.130	0.011	0.024	0.000	.391			

### Mechanical Properties:

Tensile(PSI):	Yield(PSI):	Elong(%):	RA(%):	Hardness:
75000	52000	33.00	67.00	BHN 139-139

### Comments:

Normalized.  
Cold drawn. Meets Nace MR-01-75/2009, MR-01-03/2010, and ISO 15156/2009.

\*\*\*\*\* Specifications - Heat Code **W22078 ZZ: \*\*\*\*\***  
A105/A105M-11, SA105, A234-11 WPB, SA234 WPB, ASME B16.5,  
B16.9, B16.11, B16.36, B1.20.1, MSS SP-25, SP-44, SP-79,  
SP-83, SP-95, API-605, A.W.W.A.  
STARTING MATERIAL: BAR/BILLET/FORGING  
A234-07 WPBN, SA234 WPBN

### Chemical Composition:

C:	Mn:	P:	S:	Si:	Cr:	Ni:	Mo:
0.180	0.930	0.009	0.004	0.190	0.070	0.280	0.010
Cu:	V:	Al:	Cb:	C.E.:			
0.110	0.011	0.020	0.000	.379			

### Mechanical Properties:

Tensile(PSI):	Yield(PSI):	Elong(%):	RA(%):	Hardness:
75500	47500	32.00	70.00	BHN 152

### Comments:

Normalized @ 1600F for 10-15 minutes then still air cooled.  
Cold drawn.  
Meets Nace MR-01-75/2009, MR-01-03/2010 and ISO 15156/2009.

Line: **Description:**  
**3 2 X 1 S80 A234WPBN SP95 BLK CONC SWG TBE**

\*\*\*\*\* Specifications - Heat Code **W02999 ZC: \*\*\*\*\***  
A29 GRADE 1018 MODIFIED, SA29, A234-11 WPB, SA234 WPB,  
ASME B16.9, B1.20.1, MSS SP-25, SP-95, A.W.W.A.  
STARTING MATERIAL: BAR  
A234 WPBN, SA234 WPBN

### Chemical Composition:

C:	Mn:	P:	S:	Si:	Cr:	Ni:	Mo:
0.170	0.640	0.011	0.024	0.140	0.070	0.050	0.010
Cu:	V:	Al:	Cb:	Sn:	Pb:	Ti:	B:
0.120	0.002	0.001	0.001	0.006	0.000	0.000	0.0000
Ca:	C.E.:						
<.001	.304						



We hereby certify that the contents of this Material Test Report are correct and accurate to the best of our knowledge and belief, that all test results are in compliance with the material specifications and that all material meets the dimensional requirements of the order. The products described have not come into contact with mercury or any of its components. Westbrook's JSA Quality System is registered to ISO 9001, Certificate No. 32813. This document is in accordance with EN10204:2004 3.1 / DIN50049 3.1B and was electronically transmitted. This inspection certificate is issued under the authority of Westbrook Mfg's Quality Control Manager.

16182-D  
Dec 15/16  
Jucal

# WESTBROOK

## MATERIAL TEST REPORT

1111 LOCKWOOD DR.  
HOUSTON, TX 77020

Voice 713 675 6438  
Fax 713 675 9742

To: WESTBROOK CANADA LTD  
Order No.: 680203 Order Date: 10/21/2016

Purchase Order: 801912/137881  
Tag Number: DNOW PO# 25650983

Printed: 11/03/2016  
AB01 EDMONTON DC

Line: Description:  
18 1 1/2 X 1 S80 A234WPB SP95 BLK CONC SWG  
TBE

\*\*\*\*\* Specifications - Heat Code W22272 ZE: \*\*\*\*\*  
A106-14 GR.B, SA106 GR.B, A234-14 WPB, SA234 WPB, A530,  
A733, ASME B36.10, B1.20.1, MSS SP-25, SP-95  
STARTING MATERIAL: A106B PIPE & TUBE  
A234-14 WPBN, SA234 WPBN

### Chemical Composition:

C:	Mn:	P:	S:	Si:	Cr:	Ni:	Mo:
0.210	0.510	0.016	0.006	0.230	0.020	0.010	0.001
Cu:	V:	C.E.:					
0.020	0.001	.301					

### Mechanical Properties:

Tensile(PSI):	Yield(PSI):	Elong(%):	Hardness:	Bend:
60916	41336	38.00	HRB 71	SATISFACTORY

### Comments:

Normalized 1679F, 30 minutes, still air cooled.  
Eddy current test in lieu of hydro.  
Meets Nace MR-01-75/2009, MR-01-03/2010, and ISO 15156/2009.



We hereby certify that the contents of this Material Test Report are correct and accurate to the best of our knowledge and belief, that all test results are in compliance with the material specifications and that all material meets the dimensional requirements of the order. The products described have not come into contact with mercury or any of its components. No weld repair performed. Westbrook's Quality System is registered to ISO 9001, Certificate #32813. This document is in accordance with EN10204:2004 3.1/DIN50049 3.1B and was electronically transmitted. This inspection certificate is issued under the authority of Westbrook's QA Manager.

16182-D  
Dec 15/16  
JMO

# WESTBROOK

## MATERIAL TEST REPORT

1111 LOCKWOOD DR.  
HOUSTON, TX 77020

Voice 713 675 6438  
Fax 713 675 9742

Sold To: **DNOW L.P.**  
Order No.: 674732

Order Date: 8/29/2016

Purchase Order: 25626674

Printed: 9/08/2016

Line: Description:  
20 1/2 X 1/4 S80 A234WPBN SP95 GALV CONC 3602  
SWG TBE

\*\*\*\*\* Specifications - Heat Code **W22234 ZE: \*\*\*\*\***  
A105/A105M-14, SA105, A234-14 WPB, SA234 WPB, ASME B16.5,  
B16.9, B16.11, B16.36, B1.20.1, MSS SP-25, SP-44, SP-79,  
SP-83, SP-95, API-605, A.W.W.A.  
STARTING MATERIAL: BAR/BILLET/FORGING  
A234-14 WPBN, SA234 WPBN

### Chemical Composition:

C:	Mn:	P:	S:	Si:	Cr:	Ni:	Mo:
0.260	0.780	0.011	0.006	0.210	0.030	0.010	0.010
Cu:	V:	Cb:	C.E.:				
0.010	0.004	0.011	.400				

### Mechanical Properties:

Tensile(PSI):	Yield(PSI):	Elong(%):	RA(%):	Hardness:
72519	43687	35.00	66.00	HRB 73

### Comments:

Normalized 1600F for 10-15 minutes then still air cooled.  
Cold drawn.  
Meets Nace MR-01-75/2009, MR-01-03/2010, and ISO 15156/2009.



Distribution NOV/  
IATR Reviewed *EC*

We hereby certify that the contents of this Material Test Report are correct and accurate to the best of our knowledge and belief, that all test results are in compliance with the material specifications and that all material meets the dimensional requirements of the order. The products described have not come into contact with mercury or any of its components. No weld repair performed. Westbrook's Quality System is registered to ISO 9001, Certificate #32813. This document is in accordance with EN10204:2004 3.1/DIN50049 3.1B and was electronically transmitted. This inspection certificate is issued under the authority of Westbrook's QA Manager.

16182-D  
Dec 15/16  
*[Signature]*

# WESTBROOK

## MATERIAL TEST REPORT

PO Box 53591  
Edmonton, AB T6X0P0

Voice 780-490-4976  
Fax 780 490 0471

To: **DNOW CANADA ULC**  
Order No.: 139325 Order Date: 12/09/2016

Purchase Order: 659063042-AB42

Printed: 12/09/2016

Line: Description:  
1 1/2 X 1/8 S80 A234WPBN SP95 BLK CONC SWG  
TBE

\*\*\*\*\* Specifications - Heat Code W00172: \*\*\*\*\*  
A105/A105M-09, SA105, A234-07 WPB, SA234 WPB, ASME B16.5,  
B16.9, B16.11, B16.36, MSS SP-25, SP-44, SP-79, SP-83,  
SP-95, API-605, A.W.W.A.  
STARTING MATERIAL: BAR/BILLET/FORGING

### Chemical Composition:

C:	Mn:	P:	S:	Si:	Cr:	Ni:	Mo:
0.180	0.930	0.007	0.010	0.220	0.070	0.300	0.020
Cu:	V:	Al:	Cb:	C.E.:			
0.130	0.010	0.030	0.000	.383			

### Mechanical Properties:

Tensile(PSI):	Yield(PSI):	Elong(%):	RA(%):	Hardness:
76000	50500	32.00	71.00	B11N 144

### Comments:

Normalized.  
Cold drawn.  
Meets Nace MR-01-75/2009, MR-01-03/2010 and ISO 15156/2009.



We hereby certify that the contents of this Material Test Report are correct and accurate to the best of our knowledge and belief, that all test results are in compliance with the material specifications and that all material meets the dimensional requirements of the order. The products described have not come into contact with mercury or any of its components. Westbrook's USA Quality System is registered to ISO 9001, Certificate No. 32813. This document is in accordance with EN10204:2004 3.1 / DIN50049 3.1B and was electronically transmitted. This inspection certificate is issued under the authority of Westbrook Mfg's Quality Control Manager.

16182-D  
Dec 15/16  
WMAO

*Attn: Tasha*

1154909



**ALBERTA  
OIL TOOL**

ADDD

16182-D  
Dec 15/16  
Jueo

**MILL TEST REPORT**

AOT HEAT CODE: **ADDD**

**General Information:**

Raw Material Manufacturer:	Niagara Lasalle Corp.	Date:	24/03/99
Description:	7/8" Hex Bar	P.O. No.:	
Specification:	ASTM A234-97 WPB	Heat No.:	C18002

**Chemical Properties:**

C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V	Cb/Nb	Other
.19	.81	.007	.027	.25	.08	.03	.03	.005	.024		Al .004

**Mechanical Properties:**

Tensile:	84000 PSI	Elongation (%):	25.5
Yield:	67200 PSI	Reduction of Area:	63.7
Charpy Impact:		Hardness:	RB 86
Heat Treatment:		Hydrostatic Test:	
Other Tests:	USED FOR 331537A602		

**Notes:**

3/8" x 1/8" XH Smls Swage Nipple

Manufactured to: ASTM A234-02/ASME SA234-01 Gr. WPBS58

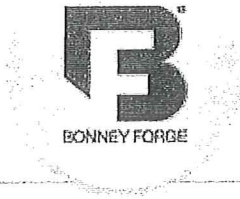


WE CERTIFY THAT THIS DOCUMENT IS DIRECTLY TRACEABLE TO THE MANUFACTURES ORIGINAL MILL TEST REPORT AND THAT SAID TEST REPORT CAN BE SUPPLIED UPON REQUEST.

APPROVED BY: *S. Outcrop*

Maintained by: Myles Rempel	Rev. A	Doc Name: ADDD.SAM
Approved by: Daryl Harrington	Date: 05/08/95	Page: 1 of 1





# MILL TEST REPORTS

Bonney Forge  
 14496 Croghan Pike  
 Mt. Union, PA 17066

## CERTIFIED MILL TEST REPORT

NOV Canada 8/30/2016

LOT NO.

6965 Male

CHEMICAL ANALYSIS, PHYSICAL PROPERTIES, REMARKS

1" 3M A105N Lugnut Union Threaded

C	0.210	MN	1.030	P	0.006	S	0.019	SI	0.210
NI	0.030	CR	0.040	MO	0.007	CU	0.080	CO	0.004
V	0.003	AL	0.027	Nb	0.012				
CE(LONG FORMULA) = 0.399									
T/S(PSI) 73072 Y/S(PSI) 48351 EL(%) 34.350 RA(%) 64.100									
BRINELL HARDNESS 135, 132									

1115 Female

1" 3M A105N Lugnut Union Threaded

C	0.200	MN	1.020	P	0.005	S	0.019	SI	0.230
NI	0.020	CR	0.030	MO	0.005	CU	0.060	CO	0.003
V	0.003	AL	0.025	Nb	0.012				
CE(LONG FORMULA) = 0.383									
T/S(PSI) 71740 Y/S(PSI) 48334 EL(%) 36.000 RA(%) 63.140									
BRINELL HARDNESS 132, 132									

M1AW Nut

1" 3M A105N Lugnut Union Threaded

C	0.190	MN	1.040	P	0.012	S	0.022	SI	0.210
NI	0.090	CR	0.160	MO	0.030	CU	0.180	V	0.001
AL	0.018	Nb	0.002						
CE(LONG FORMULA) = 0.420									
T/S(PSI) 76170 Y/S(PSI) 51141 EL(%) 35.750 RA(%) 61.680									
BRINELL HARDNESS 135, 135									

16182-D  
 Dec 15/16  
 Ueno




1. CERTIFYING ASTM A105-14 / ASME SA105-15 EDITION.
2. THE MATERIAL SUPPLIED IDENTIFIED AS A105N WAS NORMALIZED IN ACCORDANCE WITH ASTM A105 HEAT TREATING REQUIREMENTS.
3. THE MATERIAL SUPPLIED WAS INSPECTED AND MANUFACTURED IN ACCORDANCE WITH EN DIN 10204:2004 EDITION TYPE 3.1 INSPECTION DOCUMENT.
4. THE MATERIAL SUPPLIED AS A105N MEETS THE REQUIREMENTS OF BOTH NACE MRO103-2010 AND NACE MRO175/ISO 15156-2.
5. THE ELONGATION TEST RESULTS ARE OBTAINED USING STANDARD ROUND SPECIMEN, 2 INCH OR 50 MM GAGE LENGTH.

THIS DOCUMENT HAS BEEN ELECTRONICALLY SUBMITTED.

Cancel	Logout
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16182-D  
Dec 15/16  
JMC

	<b>I.M.L. - INDUSTRIA MECCANICA LIGURE S.P.A.</b> Via Giancarlo Farina, 25 - 16030 Casarza Ligure - GE - ITALY Tel. +39 0185 467661 - Fax +39 0185 466510 - E-mail quality@imlitaly.com MATERIAL TEST DEPARTMENT	A01	<b>COMPANY WITH QUALITY</b> SYSTEM ISO 9001: 2008 CERTIFIED BY RINA CERT. N° 23/91/S
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INSPECTION CERTIFICATE EN 10204:2004 / 3.1	A02	Nr <sup>A03</sup> 2016-C_IML-28234	Data / Dated 19.05.2016	Z02
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<b>FORGED FLANGES &amp; FITTINGS LTD</b> UNIT 24 - WROTHAM BUSINESS PARK - WROTHAM PARK BARNET - HERTFORDSHIRE - EN5 4SZ - UNITED KINGDOM GB	A05	<b>Ordine / PO</b> 4165C <b>Item</b> 11 <b>DDT / Delivery note</b> 2016-2E301-0000642 <b>Packing List</b> 2016-2E301-0000642 <b>Fattura / Invoice</b> 2016-2E401-0000610 <b>Ns. rif. / Our ref.</b> 2016-2E201-0000787-0011	A07	A08
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<b>Dest. FFF CANADA</b> 1811 - 66th AVENUE, NW. EDMONTON, ALBERTA T6P 1M5	A05	CA
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Cod. colata Heat Code	Nr. colata Heat Nr	Quantità Quantity	Descrizione Description
K525	15/74217	10.000,00	FITTING HEX.H.PLUG 3/6M THRD NPT 1/2" A105N Package No. 240

Mat. in acc. a / Mat. in acc. to <sup>B02</sup> ASTM A105/A105M-14  
 ASME SA105/SA105M, ASME II PART A Ed.2013  
 ANSI/NACE MR 0175 - ISO 15156 Ed.2015 / NACE MR 0103 Ed. 2012  
 P.E.D. 97/23/EC ANNEX 1 PAR. 4.3

Ann. mat. / Mat. remarks <sup>B02</sup> MATERIAL FULLY KILLED & FINE GRAIN PRACTICED MATERIAL IS FREE FROM MERCURY CONTAMINATION & RADIATION

Elementi / Elements	C	Si	Mn	S	P	Cr	Ni	Mo	Ti	Cu	V	Nb	N
LADLE ANALYSIS	0,200	0,210	0,970	0,010	0,013	0,110	0,060	0,010	0,018	0,190	0,001	0,001	0,000
LADLE ANALYSIS	Al	0,025							CE LF	CE SF	F1	F2	PREN
									0,403	0,362	0,371	0,120	0,143

Provetta Test specimen	Forma Shape	°C <sup>C03</sup>	Snervamento>0,2% Yield Strength>0,2%	Snervamento>1,0% Yield Strength>1,0%	Rottura Tensile	Allungamento Elongation	Contrazione Reduction of area
Sez/Sect mm <sup>2</sup> L. mm	1=O - 2=□		MPa	MPa	MPa	%	%
122,65 50,00	1	20	341,0	--	534,0	33,0	58,0

DUREZZA / HARDNESS	RESILIENZA / IMPACT TEST
HBW	1-Joule
158,0 - 162,0	64
Tipo/Type KV	2-Joule
KV	67
10x10mm	3-Joule
	65
	Media/Average
	65,3

Tratt. Term. / Heat treatment <sup>C70</sup> Normalized at 880°-920°C / Air Cool

Dim in acc. a / Dim. acc. to <sup>B14</sup> ASME B16.11 Ed.2011 - ASME B1.20.1 Ed.2013 - MSS SP25 Ed.2013

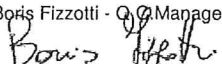

Marcatura in acc. Marking in acc. to	MSS SP25 Ed. 2013	Vis. & Dim.	SATISFACTORY	Origine Origin of Steel
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Note / Notes 100% MANUFACTURED IN ITALY  
 SUPPLIED MATERIAL MEETS SPECIFICATIONS AND P.O. REQUIREMENTS

16182-D  
 Dec 15/16  
 Mace



VERIFIED TRUE COPY  
 OF ORIGINAL  
 FORGED FLANGES & FITTING  
 LIMITED

<b>UFFICIO CONTROLLO QUALITA'</b> QUALITY CONTROL DEPARTMENT Boris Fizzotti - Q.C. Manager 	<b>ENTE UFFICIALE DI COLLAUDO</b> INSPECTION AUTHORITY	<b>MARCHIO PRODUZIONE</b> MANUFACTURER'S SYMBOL IML or 
---	---	--

	<b>I.M.L. - INDUSTRIA MECCANICA LIGURE S.P.A.</b> Via Giancarlo Farina, 25 - 16030 Casarza Ligure - GE - ITALY Tel. +39 0185 467661 - Fax +39 0185 466510 - E-mail quality@imlitaly.com <b>MATERIAL TEST DEPARTMENT</b>	A01	<b>COMPANY WITH QUALITY</b> <b>SYSTEM ISO 9001: 2008 CERTIFIED</b> <b>BY RINA</b> <b>CERT. N° 23/91/S</b>
	<b>INSPECTION CERTIFICATE EN 10204:2004 / 3.1</b>		

<b>FORGED FLANGES &amp; FITTINGS LTD</b> UNIT 24 - WROTHAM BUSINESS PARK - WROTHAM PARK BARNET - HERTFORDSHIRE - EN5 4SZ - UNITED KINGDOM GB		Ordine / PO 4165C Item 12 DDT / Delivery note 2016-2E301-0000853 Packing List 2016-2E301-0000853 Fattura / Invoice 2016-2E401-0000805 Ns. rif. / Our ref. 2016-2E201-0000787-0012
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Dest. FFF CANADA 1811 - 66th AVENUE, NW. EDMONTON, ALBERTA T6P 1M5	CA
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Cod. colata Heat Code	Nr. colata Heat Nr	Quantità Quantity	Descrizione Description
K603	16/78589	5.000,00	FITTING HEX.H.PLUG 3/6M THRD NPT 1" A105N Package No. 249 No. 100 boxes - 50pcs/box

Mat. in acc. a / Mat. in acc. to **ASTM A105/A105M-14**  
 ASME SA105/SA105M, ASME II PART A Ed.2013  
 ANSI/NACE MR 0175 - ISO 15156 Ed.2015 / NACE MR 0103 Ed. 2012  
 P.E.D. 97/23/EC ANNEX 1 PAR. 4.3

Ann. mat. / Mat. remarks **MATERIAL FULLY KILLED & FINE GRAIN PRACTICED MATERIAL IS FREE FROM MERCURY CONTAMINANT & RADIATION**

Elementi / Elements	C	Si	Mn	S	P	Cr	Ni	Mo	Ti	Cu	V	Nb	N
LADLE ANALYSIS	0,180	0,230	1,070	0,009	0,015	0,130	0,070	0,010	0,019	0,200	0,002	0,001	0,000
LADLE ANALYSIS	AI	0,028							CE LF	CE SF	F1	F2	PREN
									0,405	0,358	0,412	0,140	0,163

CE LF=C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15    CE SF=C+(Mn/6)    F1=Cu+Ni+Cr+Mo+V    F2=Cr+Mo

Provetta Test specimen	Forma Shape	°C <sup>C03</sup>	Snervamento>0,2% Yield Strength>0,2%	Snervamento>1,0% Yield Strength>1,0%	Rottura Tensile	Allungamento Elongation	Contrazione Reduction of area
Sez/Sect mm <sup>2</sup>	L. mm	1=O - 2=□	MPa	MPa	MPa	%	%
122,65	50,00	1	20	331,0	515,0	32,8	57,4

DUREZZA / HARDNESS	RESILIENZA / IMPACT TEST			
HBW	1-Joule	2-Joule	3-Joule	Media/Average
159,0 - 162,0	71	75	78	74,7

Tratt. Term. / Heat treatment Normalized at 880°-920°C / Air Cool    ELECTRIC FURNACE

Dim in acc. a / Dim. acc. to ASME B16.11 Ed.2011 - ASME B1.20.1 Ed.2013 - MSS SP25 Ed.2013

Marcatura in acc. Marking in acc. to	MSS SP25 Ed. 2013	Vis. & Dim.	SATISFACTORY	Origine Origin of Steel
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Note / Notes 100% MANUFACTURED IN ITALY  
 SUPPLIED MATERIAL MEETS SPECIFICATIONS AND P.O. REQUIREMENTS



16182-D  
 Dec 15/16  
 [Signature]

<b>UFFICIO CONTROLLO QUALITA'</b> QUALITY CONTROL DEPARTMENT Boris Fizzotti - Q. Manager 	<b>ENTE UFFICIALE DI COLLAUDO</b> INSPECTION AUTHORITY	<b>MARCHIO PRODUZIONE</b> MANUFACTURER'S SYMBOL IML or 
---	---	--

 <b>I.M.L. - INDUSTRIA MECCANICA LIGURE S.P.A.</b> Via Giancarlo Farina, 25 - 16030 Casarza Ligure - GE - ITALY Tel. +39 0185 467661 - Fax +39 0185 466510 - E-mail quality.iml@farinagroup.com <b>MATERIAL TEST DEPARTMENT</b>	A01	<b>COMPANY WITH QUALITY SYSTEM ISO 9001: 2008 CERTIFIED BY RINA CERT. N°23/91/S</b>
	<b>INSPECTION CERTIFICATE EN 10204:2004 / 3.1</b>	

<b>DNOW CANADA ULC</b> 1800, 635-8th Avenue S.W. Calgary, Alberta, Canada T2P 3M3	A06	CA	<b>Ordine / PO</b> 25331611 <b>Item</b> 1390 <b>DDT / Delivery note</b> 2014-2E301-0001129 <b>Packing List</b> 2014-2E401-0001050 <b>Fattura / Invoice</b> 2014-2E401-0001050 <b>Ns. rif. / Our ref.</b> 2014-2E201-0001184-0139	A07	A08
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<b>Dest. UMB CA AB EDMONTON DC - DNOW CANADA ULC</b> 2603 -76 AVENUE T6P 1P6 EDMONTON - ALBERTA	A06	CA
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Cod. colata Heat Code	Nr. colata Heat Nr	Quantità Quantity	Descrizione Description
NK	1629	1.400,00	FITTING HEX.H.PLUG 3/6M THRD NPT 3/8" A105N

Mat. in acc. a / Mat. in acc. to <sup>B02</sup> ASME SA ASTM A105-13  
 NACE MR 0175 - ISO 15156 Ed. 2009 / NACE MR 0103 Ed. 2012  
 P.E.D. 97/23/EC ANNEX 1 PAR. 4.3

Ann. mat. / Mat. remarks <sup>B02</sup> MATERIAL FULLY KILLED & FINE GRAIN PRACTICED

Elementi / Elements <sup>(C71 - C92)</sup>	C	Si	Mn	S	P	Cr	Ni	Mo	Ti	Cu	V	Nb	N
LADLE ANALYSIS	0,195	0,250	1,050	0,015	0,020	0,130	0,060	0,010	0,000	0,200	0,003	0,001	0,000
LADLE ANALYSIS	AI	0,000							CE LF	CE SF	F1	F2	PREN
									0,416	0,370	0,403	0,140	--

CE LF=C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15    CE SF=C+Mn/6)    F1=Cu+Ni+Cr+Mo+V    F2=Cr+Mo

Provetta Test specimen	Forma Shape	Temperatura °C	Snervamento Yield Strength	Snervamento Yield Strength	Rottura Tensile	Allungamento Elongation	Contrazione Reduction of area
Sez/Sect mm2	L mm	1=O - 2=□	MPa	MPa	MPa	%	%
122,65	50,00	1	20	325,0	-	533,0	31,0
							59,0

DUREZZA / HARDNESS <sup>C22</sup>	RESILIENZA / IMPACT TEST
HBW	Tipo/Type <sup>C40</sup>
158,0 - 160,0	Provetta / Test Specimen
	10x10mm
	Temperatura <sup>C03</sup>
	-10
	1-Joule <sup>C42</sup>
	70
	2-Joule <sup>C42</sup>
	73
	3-Joule <sup>C42</sup>
	74
	Media/Average <sup>C43</sup>
	72,3

Tratt. Term. / Heat treatment <sup>C70</sup> Normalized at 880°-920°C / Air Cool    ELECTRIC FURNACE

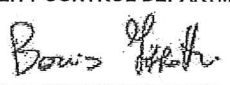

Dim in acc. a / Dim. acc. to <sup>B14</sup> ASME B16.11 Ed.2011 - ASME B1.20.1 Ed.2013 - MSS SP25 Ed.2013

<b>Marcatura in acc. <sup>B08</sup></b> <b>Marking in acc. to</b>	MSS SP25 Ed. 2013	<b>Vis. &amp; Dim.</b>	SATISFACTORY	<b>Origine</b> <b>Origin of Steel</b>	EUROPEAN UNION
--	-------------------	------------------------	--------------	--	----------------

Note / Notes 100% MANUFACTURED IN ITALY  
 SUPPLIED MATERIAL MEETS SPECIFICATIONS AND P.O. REQUIREMENTS



16182-D  
 Dec 15/16  
 [Signature]

<b>UFFICIO CONTROLLO QUALITA'</b> <b>QUALITY CONTROL DEPARTMENT</b> 	<b>ENTE UFFICIALE DI COLLAUDO</b> <b>INSPECTION AUTHORITY</b>	<b>MARCHIO PRODUZIONE</b> <b>MANUFACTURER'S SYMBOL</b> <b>IML</b> or  
---	--	--



I.M.L. - INDUSTRIA MECCANICA LIGURE S.P.A.  
 Via Giancarlo Farina, 25 - 16030 Casarza Ligure - GE - ITALY  
 Tel. +39 0185 467661 - Fax +39 0185 466510 - E-mail quality.iml@farinagroup.com  
 MATERIAL TEST DEPARTMENT

COMPANY WITH QUALITY  
 SYSTEM ISO 9001: 2008 CERTIFIED  
 BY RINA  
 CERT. N°23/91/S

INSPECTION CERTIFICATE EN 10204:2004 / 3.1

Nr 25336 Dated 05.06.2014

DNOW CANADA ULC

1800, 635-8th Avenue S.W.  
 Calgary, Alberta, Canada T2P 3M3

CA

Purchase Order Nr 25244711  
 Item Nr 410  
 Packing List Nr 665  
 Invoice Nr

Heat Code	Heat Nr	Quantity	Description
181M	13/75980	1.500,00	FITTING COUPLING THRD NPT 3M 1" A105N

Material in accordance ASME SA ASTM A105-13  
 NACE MR 0175 - ISO 15156 Ed. 2009 / NACE MR 0103 Ed. 2012  
 P.E.D. 97/23/EC ANNEX 1 PAR. 4.3

Material remarks MATERIAL FULLY KILLED & FINE GRAIN PRACTICED

Element	C	Si	Mn	S	P	Cr	Ni	Mo	Ti	Cu
ASTM A105 (LADLE)	0,195	0,200	0,960	0,010	0,014	0,120	0,050	0,010	0,022	0,110

Element	V	Nb	N	AL	C.E.	PRE
ASTM A105 (LADLE)	0,003	0,003	--	0,025	0,392	--

Test specimen Sect. mm2	Length mm	Shape 1=O - 2=□	Tensile N/mm2	Yield Strength > 0,2% N/mm2	Yield Strength >1% N/mm2	Elongation %	Reduction of area %
122,65	50,00	1	516,0	328,0	--	34,0	58,0

HARDNESS

HBW  
 156,0 - 162,0

TYPE

Test specimen  
 10x10mm

°C  
 -10

IMPACT TEST

1-Joule  
 63

2-Joule  
 63

3-Joule  
 67

Heat treatment	Normalized at 880°-920°C / Air Cool	ELECTRIC FURNACE
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Dimension in accordance	ASME B16.11 Ed.2011 - ASME B1.20.1 Ed.2013 - MSS SP25 Ed.2013
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Visual & Dimensional	SATISFACTORY	Origin	EUROPEAN UNION	Our Ref.	2014-2E201-0000655-0041
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Notes 100% MANUFACTURED IN ITALY  
 SUPPLIED MATERIAL MEETS SPECIFICATIONS AND P.O. REQUIREMENTS



16182-D  
 Dec 15/16  
 WMAQ

QUALITY CONTROL DEPT. Boris Fizzotti <i>Boris Fizzotti</i>	INSPECTION AUTHORITY	MANUFACTURER'S SYMBOL IML or
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## INSPECTION CERTIFICATE

Certificato d'ispezione

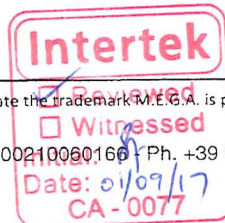


REPORT N. Rapporto N.		TC-013936-14-0002		Issued on Emesso il		26/11/2014		Customer Cliente		DNOW CANADA ULC		Job n. / Com. n.		13936		Page n. / Pagina n.		1 of 6							
Revision Revisione		0		According to In accordo a		EN 10204:2005		Type Tipo		3.1		Purchase order and project/Ordine e progetto		25332437											
DESCRIPTION / DESCRIZIONE																									
Test Prova	Item Pos.	Qty Q.tà	Customer code Codice cliente			Material Materiale			Heat Colata			Product Prodotto													
VDRL	6	173	3878			A/SA105-13			11/39405			BUSHING M/F NPT A/SA105N 2x1/2													
VLDX	6	2327	3878			A/SA105-13			12/72457			BUSHING M/F NPT A/SA105N 2x1/2													
JBLF	10	2500	3901			A/SA105-13			13/76557			COUPLING S. 3000 NPT A/SA105N 1/2													
JASS	11	2400	3899			A/SA105-13			13/74580			COUPLING S. 3000 NPT A/SA105N 1/4													
JBRS	13	4050	3902			A/SA105-13			13/76483			COUPLING S. 3000 NPT A/SA105N 3/4													
Test Prova	HEAT TREATMENT DATA AND REFERENCES TO OTHER CERTIFICATES / Dettagli di trattamento termico e riferimenti ad altri certificati										RAW AND FORGING MATERIAL CERTIFICATES / Certificati di acciaieria/forgia														
VDRL	MATERIAL PRODUCED BY ELECT.FURNACE-NORMALIZED AT 900 C COOLED IN STILL AIR.										CERT.120+130.EVASI*585726MEGA														
VLDX	MATERIAL PRODUCED BY ELECT.FURNACE-NORMALIZED AT 900 C COOLED IN STILL AIR.										CERT.305.EVASI*587936MEGA														
JBLF	MATERIAL PRODUCED BY ELECT.FURNACE-NORMALIZED AT 900 C COOLED IN STILL AIR.										CERT.23810.RIVA*0048MEGA*														
JASS	MATERIAL PRODUCED BY ELECT.FURNACE-NORMALIZED AT 900 C COOLED IN STILL AIR.										CERT.9547.RIVA*592107MEGA*														
JBRS	MATERIAL PRODUCED BY ELECT.FURNACE-NORMALIZED AT 900 C COOLED IN STILL AIR.										CERT.27192.RIVA*0057MEGA*														
Test Prova	Test loc. Preso a	Orient. Direz.	TENSILE TEST AT ROOM TEMPERATURE / Trazione a temperatura ambiente							CVN (KV) / Prova di resilienza							Bend Piega	Flatten. Schiacc.	Hardness Durezza [HBN]						
			Specimen / Provino		Yield strength		Tensile strength		Elongation		Red. Of Area		Dimens.		T		Abs. Energy		Shear A		Lat Exp				
			Shape Forma	A [mm <sup>2</sup> ] Sezione	L [mm] Lungh.	Snerv [Mpa] Min:	Rottura [Mpa] Min:	Allung. [%] Min:	Contraz. [%] Min:	Dimens. [mm]	Temp. [°C]	Energia ass. [J]	Area d [%]	Exp. Lat. [mm]											
VDRL	T/2	LONG	Round	30.600	25.000	325.000	533.000	29.200	66.900	10x10x55	0	46 - 56 - 58	--	--											149 - 156
VLDX	T/2	LONG	Round	30.500	25.000	320.100	533.600	29.500	69.300	10x10x55	0	74 - 56 - 58	--	--											156 - 159
JBLF	T/2	LONG	Round	123.500	50.000	372.000	538.200	35.100	64.700	10x10x55	0	137 - 154 - 133	--	--											152 - 154
JASS	T/2	LONG	Round	60.300	35.000	383.300	551.600	37.200	71.300	10x10x55	0	163 - 156 - 159	--	--											158 - 160
JBRS	T/2	LONG	Round	58.800	35.000	362.100	541.000	41.200	63.300	10x10x55	0	139 - 134 - 160	--	--											150 - 152
Test Prova	C [%]	Si [%]	Mn [%]	S [%]	P [%]	Cr [%]	Ni [%]	Mo [%]	Ti [%]	Cu [%]	V [%]	Al [%]	Co [%]	Nb [%]	N [%]	Sn [%]	W [%]	B [%]	Fe [%]	Zr [%]	CE <sup>A</sup> [%]	PREN <sup>B</sup> [%]	X fact. <sup>C</sup> [%]	J fact. <sup>D</sup> [%]	
VDRL	0.2000	0.2500	0.9800	0.0100	0.0110	0.0900	0.0500	0.0100	0.0160	0.1100	0.0150	0.0230		0.0100		0.0070									0.3969
VLDX	0.2000	0.1800	0.9100	0.0100	0.0090	0.1000	0.0500	0.0100	0.0220	0.1500	0.0190	0.0260		0.0020		0.0080									0.3907
JBLF	0.1900	0.2100	0.9300	0.0010	0.0130	0.1200	0.0600	0.0100	0.0200	0.1700	0.0020	0.0250		0.0020		0.0100									0.3867
JASS	0.1850	0.2200	0.9700	0.0090	0.0140	0.1300	0.0600	0.0100	0.0170	0.1800	0.0030	0.0300		0.0020		0.0100									0.3912
JBRS	0.2000	0.2400	0.8900	0.0040	0.0120	0.0900	0.0500	0.0100	0.0170	0.1300	0.0020	0.0260		0.0020		0.0070									0.3807
REMARKS / Note																									
1: MATERIAL ACCORDING TO NACE MR0175/ISO 15156-1-2-3 Ed.2009. MATERIAL ACCORDING TO NACE MR0103 Ed.2012										A: CE = C + Mn/6 + (Cr+Mo+V)/5 + (Cu+Ni)/15   B: PREN = Cr + 3.3Mo + 16N															
2: FULLY KILLED STEEL AND FINE GRAIN TREATED										C: X factor = (10P + 5Sb+4Sn+As)/100 - elements expressed in ppm															
										D: J factor = (( Mn + Si ) / ( P + Sn )) x 104															
										Quality inspector representative					Riccardo Scorsetti										
										Ispettore controllo qualità															

This certificate is issued by a computerized system and it is valid with electronic signature. On the original certificate the trademark M.E.G.A. is printed in green color.

Form QC-01-01 Rev. 0 2013-03-15

M.E.G.A. S.p.A. - Via Dalla Chiesa, 3 - 24020 Scanzorosciate (Bergamo) - Italy - VAT IT 0021000166 - Ph. +39 035 661280 / 661199 - Fax +39 035 665535 - E-mail inspection@meqa-fittings.com



16182-D  
Dec 15/16  
Ulucb

## INSPECTION CERTIFICATE

Certificato d'ispezione



REPORT N. Rapporto N		TC-013936-14-0002		Issued on Emesso il		26/11/2014		Customer Cliente		DNOW CANADA ULC		Job n. / Com. n.		13936		Page n. / Pagina n.		5 of 6							
Revision Revisione		0		According to In accordo a		EN 10204:2005		Type Tipo		3.1		Purchase order and project/Ordine e progetto		25332437											
DESCRIPTION / DESCRIZIONE																									
Test Prova	Item Pos.	Qty Q.tà	Customer code Codice cliente		Material Materiale		Heat Colata		Product Prodotto																
VTNF	35	783	5609		A/SA105-13		P4121249842		UNION S. 3000 NPT A/SA105N 2 female																
VTNL	35	783	5609		A/SA105-13		P4121249842		UNION S. 3000 NPT A/SA105N 2 nut																
Test Prova	HEAT TREATMENT DATA AND REFERENCES TO OTHER CERTIFICATES / Dettagli di trattamento termico e riferimenti ad altri certificati										RAW AND FORGING MATERIAL CERTIFICATES / Certificati di acciaieria/forgia														
VTNF	MATERIAL PRODUCED BY ELECT.FURNACE-NORMALIZED AT 910 C COOLED IN STILL AIR.										CERT.2012/0040297.FEAT*590283MEGA*														
VTNL	MATERIAL PRODUCED BY ELECT.FURNACE-NORMALIZED AT 910 C COOLED IN STILL AIR.										CERT.2012/0040296.FEAT*590283MEGA*														
Test Prova	Test loc. Preso a	Orient. Direz.	TENSILE TEST AT ROOM TEMPERATURE / Trazione a temperatura ambiente							CVN (KV) / Prova di resilienza					Bend Piega	Flatten. Schiacc.	Hardness Durezza [HBN]								
			Specimen / Provino			Yield strength Snerv [Mpa]	Tensile strength Rottura [Mpa]	Elongation Allung. [%]	Red. Of Area Contraz. [%]	Dimens. [mm]	T Temp. [°C]	Abs. Energy Energia ass. [J]	Shear A Area d [%]	Lat Exp Esp. Lat. [mm]											
			Shape Forma	A [mm <sup>2</sup> Sezione	L [mm] Lungh.	Min:	Min:	Min:	Min:																
VTNF	T/2	LONG	Round	30.400	25.000	282.200	499.700	31.100	59.400	10x10x55	0	92 - 98 - 106	--	--			144 - 148								
VTNL	T/2	LONG	Round	30.400	25.000	281.400	496.800	30.100	63.200	10x10x55	0	92 - 96 - 116	--	--			145 - 152								
Test Prova	C [%]	Si [%]	Mn [%]	S [%]	P [%]	Cr [%]	Ni [%]	Mo [%]	Ti [%]	Cu [%]	V [%]	Al [%]	Co [%]	Nb [%]	N [%]	Sn [%]	W [%]	B [%]	Fe [%]	Zr [%]	CE <sup>A</sup> [%]	PREN <sup>B</sup> [%]	X fact. <sup>C</sup> [%]	J fact. <sup>D</sup> [%]	
VTNF	0.1800	0.2400	0.8200	0.0090	0.0130	0.1600	0.0260	0.0050		0.0380	0.0020			0.0020											0.3543
VTNL	0.1800	0.2400	0.8200	0.0090	0.0130	0.1600	0.0260	0.0050		0.0380	0.0020			0.0020											0.3543
REMARKS / Note																									
1: MATERIAL ACCORDING TO NACE MR0175/ISO 15156-1-2-3 Ed.2009 2: MATERIAL ACCORDING TO NACE MR0103 Ed.2012 3: FULLY KILLED STEEL AND FINE GRAIN TREATED												A: CE = C + Mn/6 + (Cr+Mo+V)/5 + (Cu+Ni)/15   B: PREN = Cr + 3.3Mo + 16N C: X factor = (10P + 5Sb+4Sn+As)/100 - elements expressed in ppm D: J factor = (( Mn + Si ) ( P + Sn )) x 104													
Quality inspector representative Ispettore controllo qualità												Riccardo Scorsetti 													

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Form QC-01-01 Rev. 0 2013-03-15

M.E.G.A. S.p.A. - Via Dalla Chiesa, 3 - 24020 Scanzoscale (Bergamo) - Italy - VAT IT 00210060166 - Ph. +39 035 661280 / 661199 - Fax +39 035 665535 - E-mail inspection@mega-fittings.com



16182-1  
Dec 15/16  
L. MERO



## INSPECTION CERTIFICATE

Certificato d'ispezione



REPORT N. Rapporto N.	TC-013936-14-0002	Issued on Emesso il	26/11/2014	Customer Cliente	DNOW CANADA ULC	Job n. / Com. n.	13936	Page n. / Pagina n.	6 of 6
Revision Revisione	0	According to In accordo a	EN 10204:2005	Type Tipo	3.1	Purchase order and project/Ordine e progetto 25332437			
					P.O. BOX 4395 STATION C CALGARY, ALBERTA, T2T 5N2 - CANADA				

We hereby certify that all items supplied for the above purchase orders meet all the requirements of the applicable specification of manufacture, the purchase item descriptions, purchase specifications and purchase order requirements. Visual, dimensional and marking check of items supplied has been carried out by our internal inspectors with satisfactory results.

The chemical and mechanical values shown on the EN 10204 certificate are true copy of the mill test certificate issued by the steel mill, or by the laboratory that determined it. All material is certified to be mercury free. No weld repair was performed. Marking was performed by low stress stamps in accordance with MSS SP25.

Manufacturing standards:

- 45° and 90° elbows, tees, crosses, full and half couplings, caps, square, hexagonal and round plugs, hexagonal and flush bushings are manufactured in accordance with ASME B.16.11; threads in accordance with ANSI/ASME B1.20.1.
- Outlet branches are manufactured in accordance with: ASME B.31.1, B.31.3 and MSS-SP-97
- Seamless swage nipples are manufactured in accordance with: BS3799-74 or MSS SP95-86
- Seamless pipe nipples are manufactured in accordance with: B36.10-95 or B36.19-85
- Flanged outlet branches are manufactured in accordance with: ASME B.31.1, B.31.3 and B.16.5
- Unions are manufactured in accordance with: BS 3799 or MSS SP-83

When the length of flanged nipolet is not specified in the description, it is 150 mm.

The material is according to ASTM and ASME Boiler and Pressure Vessel Code Section II.

When the Edition/Revision of the listed standards is not mentioned, it is assumed to be the latest.

Yield strength detected by 0.2% off-set method

Austenitic and duplex stainless steels have been pickled and passivated. Machined surfaces do not require pickling and passivation.

M.E.G.A. is approved with certificate 75/2002/MUC by T.U.V. (certification Body N.0036) to issue certificate of specific product control in accordance with the Pressure Equipment Directive 97/23/EC (PED) Annex 1, Paragraph 4.3.

Testing equipment used:

- Tensile test machine Galdabini Quasar 250 serial No. VAOG – Procedure QC-03 Rev. 1
- Impact test Cermac JB-W500 serial No. 04031 – Procedure QC-02 Rev. 1
- Hardness test Wolpert Dia Testor 2RC serial No. 8900298/0001 – Procedure QC-04 Rev. 0
- Chemical analysis spectrometer Baird DV4 serial No. P017 (ASTM E415 and E1086) – Procedure QC-07 Rev. 0

The product are manufactured in Italy.

Quality control laboratory Laboratorio controllo qualità	Riccardo Scorsetti 
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This certificate is issued by a computerized system and it is valid with electronic signature. On the original certificate the trademark M.E.G.A. is printed in green color.

Form QC-01-01 Rev. 0 2013-03-15

16182-D  
Dec 15/16  
Jmax

REPORT N. Rapporto N.	TC-013936-14-0001	Issued on Emesso il	20/10/2014	Customer Cliente	DNOW CANADA ULC	Job n. / Com. n.	13936	Page n./ Pagina n.	3 of 6
Revision Revisione	0	According to In accordo a	EN 10204:2005	Type Tipo	3.1	Purchase order and project/Ordine e progetto 25332437			
P.O. BOX 4395 STATION C CALGARY, ALBERTA, T2T 5N2 - CANADA									

DESCRIPTION / DESCRIZIONE

Test Prova	Item Pos.	Qty Q.tà	Customer code Codice cliente	Material Materiale	Heat Colata	Product Prodotto
UDDF	16	3281	3955	A/SA105-13	09/78913	90 DEG. ELBOW S. 2000 NPT A/SA105N 1/2
UIXB	16	19	3955	A/SA105-13	P4111146336	90 DEG. ELBOW S. 2000 NPT A/SA105N 1/2
JTLT	17	2800	3967	A/SA105-13	13/76056	90 DEG. ELBOW S. 3000 NPT A/SA105N 1/2
JCSA	18	416	3960	A/SA105-13	13/77326	90 DEG. ELBOW S. 2000 NPT A/SA105N 2
JTLF	18	784	3960	A/SA105-13	1T0000343	90 DEG. ELBOW S. 2000 NPT A/SA105N 2

Test Prova	HEAT TREATMENT DATA AND REFERENCES TO OTHER CERTIFICATES / Dettagli di trattamento termico e riferimenti ad altri certificati						RAW AND FORGING MATERIAL CERTIFICATES / Certificati di acciaieria/forgia					
UDDF	MATERIAL PRODUCED BY ELECT.FURNACE-NORMALIZED AT 900 C COOLED IN STILL AIR.						CERT.11188.MEGA/I*574557MEGA					
UIXB	MATERIAL PRODUCED BY ELECT.FURNACE-NORMALIZED AT 900 C COOLED IN STILL AIR.						CERT.12002.MEGA/I*584490MEGA					
JTLT	MATERIAL PRODUCED BY ELECT.FURNACE-NORMALIZED AT 900 C COOLED IN STILL AIR.						CERT.381.EVASI*0019MEGA					
JCSA	MATERIAL PRODUCED BY ELECT.FURNACE-NORMALIZED AT 880 C COOLED IN STILL AIR.						CERT.FC-004681-13-0006.MEGA/CERT.1128.MEGA*					
JTLF	MATERIAL PRODUCED BY ELECT.FURNACE-NORMALIZED AT 900 C COOLED IN STILL AIR.						CERT.393.EVASI*0015MEGA					

Test Prova	Test loc. Preso a	Orient. Direz.	TENSILE TEST / Trazione							CVN (KV) / Prova di resilienza					Bend Plega	Flatten. Schlacc.	Hardness Durezza [HBN]
			Specimen / Provino			Yield strength	Tensile strength	Elongation	Red. Of Area	Dimens.	T	Abs. Energy	Shear A	Lat Exp			
			Shape Forma	A [mm <sup>2</sup> Sezione	L [mm] Lungh.	Snerv. [Mpa] Min:	Rottura [Mpa] Min:	Allung. [%] Min:	Contraz. [%] Min:	Dimens. [mm]	Temp. [°C]	Energia ass. [J]	Area d [%]	Exp. Lat. [mm]			
UDDF	T/2	LONG	Round	30.600	25.000	310.000	529.000	28.300	65.900	10x10x55	0	36 - 48 - 48	--	--	149 - 152		
UIXB	T/2	LONG	Round	30.600	25.000	301.000	523.000	32.200	68.800	10x10x55	0	36 - 48 - 46	--	--	143 - 149		
JTLT	T/2	LONG	Round	60.100	35.000	341.800	517.100	40.200	69.300	10x10x55	0	162 - 164 - 161	--	--	159 - 161		
JCSA	T/2	LONG	Round	29.800	25.000	297.200	498.800	38.000	64.100	10x10x55	0	89 - 121 - 88	--	--	138 - 140		
JTLF	T/2	LONG	Round	121.700	50.000	341.200	524.300	37.800	68.100	10x10x55	0	117 - 129 - 117	--	--	146 - 148		

Test Prova	C [%]	Si [%]	Mn [%]	S [%]	P [%]	Cr [%]	Ni [%]	Mo [%]	Ti [%]	Cu [%]	V [%]	Al [%]	Co [%]	Nb [%]	N [%]	Sn [%]	W [%]	B [%]	Fe [%]	Zr [%]	CE <sup>A</sup> [%]	PREN <sup>B</sup> [%]	X fact. <sup>C</sup> [%]	J fact. <sup>D</sup> [%]
UDDF	0.1950	0.2000	0.8800	0.0040	0.0100	0.1200	0.0500	0.0200	0.0210	0.1700	0.0200	0.0250	0.0020	0.0080							0.3883			
UIXB	0.1900	0.2450	1.1200	0.0020	0.0130	0.1300	0.0160	0.0040		0.0260	0.0040	0.0320	0.0023				0.0002				0.4070			
JTLT	0.1950	0.2100	0.8700	0.0090	0.0140	0.1400	0.0600	0.0100	0.0160	0.1700	0.0160	0.0230	0.0020	0.0080							0.3885			
JCSA	0.1800	0.2000	0.8800	0.0100	0.0130	0.1500	0.0900	0.0100	0.0250	0.1900	0.0040	0.0250	0.0020	0.0110							0.3781			
JTLF	0.1670	0.2510	0.9330	0.0100	0.0100	0.0720	0.1100	0.0260		0.1930	0.0240	0.0030									0.3623			

REMARKS / Note

1: MATERIAL ACCORDING TO NACE MR0175/ISO 15156-1-2-3 Ed.2009. MATERIAL ACCORDING TO NACE MR0103 Ed.2012  
2: FULLY KILLED STEEL AND FINE GRAIN TREATED

A: CE = C + Mn/6 + (Cr+Mo+V)/5 + (Cu+Ni)/15 | B: PREN = Cr + 3.3Mo + 16N  
C: X factor = (10P + 5Sb+4Sn+As)/100 - elements expressed in ppm  
D: J factor = ((Mn + Si) (P + Sn)) x 104



Quality inspector representative  
Ispettore controllo qualità

Emmanuel Centemeri

16182-D  
Dec 15/16  
UMC



I.M.L. - INDUSTRIA MECCANICA LIGURE S.P.A.  
 Via Giancarlo Farina, 25 - 16030 Casarza Ligure - GE - ITALY  
 Tel. +39 0185 467661 - Fax +39 0185 466510 - E-mail quality.iml@farinagroup.com  
 MATERIAL TEST DEPARTMENT

COMPANY WITH QUALITY  
 SYSTEM ISO 9001: 2008 CERTIFIED  
 BY RINA  
 CERT. N° 23/91/S

INSPECTION CERTIFICATE EN 10204:2004 / 3.1 A02 Nr<sup>A03</sup> 2014-C\_IML-25733 Data / Dated 01.10.2014 Z02

DNOW CANADA ULC 1800, 635-8th Avenue S.W. Calgary, Alberta, Canada T2P 3M3	A06 CA	Ordine / PO	25331611	A07
		Item	830	
		DDT / Delivery note	2014-2E301-0001115	
		Packing List	2014-2E401-0001031	
		Fattura / Invoice	2014-2E401-0001031	
Ns. rif. / Our ref.	2014-2E201-0001184-0083			

Dest. UMB CA AB EDMONTON DC - DNOW CANADA ULC A06  
 2603 -76 AVENUE  
 T6P 1P6 EDMONTON - ALBERTA CA

Cod. colata <sup>B07</sup> Heat Code	Nr. colata <sup>B07</sup> Heat Nr	Quantità <sup>B08</sup> Quantity	Descrizione Description	B01 - (B09 - B11)
70H	13/74742	570,00	FITTING 90 ELB. THRD NPT 3M 1" A105N	

Mat. in acc. a / Mat. in acc. to<sup>B02</sup> ASME SA ASTM A105-13  
 NACE MR 0175 - ISO 15156 Ed. 2009 / NACE MR 0103 Ed. 2012  
 P.E.D. 97/23/EC ANNEX 1 PAR. 4.3

Ann. mat. / Mat. remarks<sup>B02</sup> MATERIAL FULLY KILLED & FINE GRAIN PRACTICED

Elementi / Elements <sup>(C71-C82)</sup>	C	Si	Mn	S	P	Cr	Ni	Mo	Ti	Cu	V	Nb	N
LADLE ANALYSIS	0,190	0,210	0,970	0,009	0,012	0,110	0,050	0,010	0,021	0,170	0,003	0,002	0,000
LADLE ANALYSIS	0,026								CE LF	CE SF	F1	F2	PREN
									0,391	0,352	0,343	0,120	--

CE LF=C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15    CE SF=C+Mn/6    F1=Cu+Ni+Cr+Mo+V    F2=Cr+Mo

Provetta Test specimen	Forma <sup>C10</sup> Shape	°C <sup>C03</sup>	Snervamento>0,2% <sup>C11</sup> Yield Strength>0,2%	Snervamento>1,0% <sup>C11</sup> Yield Strength>1,0%	Rottura <sup>C12</sup> Tensile	Allungamento <sup>C13</sup> Elongation	Contrazione <sup>C15</sup> Reduction of area	
Sez/Sect mm2	L. mm	1=O - 2=□	MPa	MPa	MPa	%	%	
122,65	50,00	1	20	331,0	-	509,0	35,0	58,8

DUREZZA / HARDNESS <sup>C22</sup>	Tipo/Type <sup>C40</sup>	Provetta / Test Specimen	°C <sup>C03</sup>	1-Joule <sup>C42</sup>	2-Joule <sup>C42</sup>	3-Joule <sup>C42</sup>	Media/Average <sup>C43</sup>
151,0 - 158,0	KV	10x10mm	-10	65	70	71	68,7

Tratt. Term. / Heat treatment<sup>C70</sup> Normalized at 880°920°C / Air Cool    ELECTRIC FURNACE

Dim in acc. a / Dim. acc. to<sup>B14</sup> ASME B16.11 Ed.2011 - ASME B1.20.1 Ed.2013 - MSS SP25 Ed.2013

Marchatura in acc. <sup>B06</sup> Marking in acc. to	MSS SP25 Ed. 2013	Vis. & Dim.	SATISFACTORY	Origine Origin of Steel	EUROPEAN UNION
---	-------------------	-------------	--------------	----------------------------	----------------

Note / Notes 100% MANUFACTURED IN ITALY  
 SUPPLIED MATERIAL MEETS SPECIFICATIONS AND P.O. REQUIREMENTS



16182-D  
 Dec 15/16  
 [signature]

UFFICIO CONTROLLO QUALITA' QUALITY CONTROL DEPARTMENT <i>Bow</i>	ENTE UFFICIALE DI COLLAUDO INSPECTION AUTHORITY	MARCHIO PRODUZIONE MANUFACTURER'S SYMBOL IML or
--	--	---



I.M.L. - INDUSTRIA MECCANICA LIGURE S.P.A.  
 Via Giancarlo Farina, 25 - 16030 Casarza Ligure - GE - ITALY  
 Tel. +39 0185 467661 - Fax +39 0185 466510 - E-mail quality.iml@farinagroup.com  
 MATERIAL TEST DEPARTMENT

COMPANY WITH QUALITY SYSTEM ISO 9001: 2008 CERTIFIED BY RINA CERT. N°23/91/S

INSPECTION CERTIFICATE EN 10204:2004 / 3.1 A02 Nr<sup>A03</sup> 2014-C\_IML-25733 Data / Dated 01.10.2014 Z02

DNOW CANADA ULC 1800, 635-8th Avenue S.W. Calgary, Alberta, Canada T2P 3M3	CA	Ordine / PO	25331611	A07
		Item	1140	
		DDT / Delivery note	2014-2E301-0001115	
		Packing List	2014-2E401-0001031	
		Fattura / Invoice	2014-2E401-0001031	
Ns. rif. / Our ref.	2014-2E201-0001184-0114			

Dest. UMB CA AB EDMONTON DC - DNOW CANADA ULC A06  
 2603 -76 AVENUE  
 T6P 1P6 EDMONTON - ALBERTA CA

Cod. colata Heat Code	Nr. colata Heat Nr	Quantità Quantity	Descrizione Description
1ASN	14/32310	500,00	FITTING 90 ELB. THRD NPT 3M 2" A105N

Mat. in acc. a / Mat. in acc. to B02 ASME SA ASTM A105-13  
 NACE MR 0175 - ISO 15156 Ed. 2009 / NACE MR 0103 Ed. 2012  
 P.E.D. 97/23/EC ANNEX 1 PAR. 4.3

Ann. mat. / Mat. remarks B02 MATERIAL FULLY KILLED & FINE GRAIN PRACTICED

Elementi / Elements (C71 - C92)	C	Si	Mn	S	P	Cr	Ni	Mo	Ti	Cu	V	Nb	N
LADLE ANALYSIS	0,180	0,220	0,950	0,007	0,007	0,080	0,050	0,010	0,015	0,100	0,001	0,001	0,009
LADLE ANALYSIS	Al	0,025							CE LF	CE SF	F1	F2	PREN
									0,367	0,338	0,241	0,090	-

CE LF=C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15 CE SF=C+Mn/6 F1=Cu+Ni+Cr+Mo+V F2=Cr+Mo

Provetta Test specimen	Forma Shape	Temperatura °C	Snervamento Yield Strength	Snervamento Yield Strength	Rottura Tensile	Allungamento Elongation	Contrazione Reduction of area
Sez/Sect mm2	L mm	1=O - 2=□	MPa	MPa	MPa	%	%
122,65	50,00	1	20	334,0	-	501,0	32,0
							60,0

DUREZZA / HARDNESS C22		RESILIENZA / IMPACT TEST					
HBW	Tipo/Type C40	Provetta / Test Specimen	Temperatura °C C03	1-Joule C42	2-Joule C42	3-Joule C42	Media/Average C43
156,0 - 160,0	KV	10x10mm	-10	56	50	50	52,0

Traff. Term. / Heat treatment C70 Normalized at 880°-920°C / Air Cool ELECTRIC FURNACE

Dim in acc. a / Dim. acc. to B14 ASME B16.11 Ed.2011 - ASME B1.20.1 Ed.2013 - MSS SP25 Ed.2013

Marcatura in acc. B06 Marking in acc. to	MSS SP25 Ed. 2013	Vis. & Dim.	SATISFACTORY	Origine Origin of Steel	EUROPEAN UNION
---	-------------------	-------------	--------------	----------------------------	----------------

Note / Notes 100% MANUFACTURED IN ITALY  
 SUPPLIED MATERIAL MEETS SPECIFICATIONS AND P.O. REQUIREMENTS

**Intertek**  
 Reviewed  
 Witnessed  
 Initial: M  
 Date: 01/07/17  
 CA - 0077

16182-D  
 Dec 15/16  
 UMAC

UFFICIO CONTROLLO QUALITA' A05  
 QUALITY CONTROL DEPARTMENT  
 Bous

ENTE UFFICIALE DI COLLAUDO Z03  
 INSPECTION AUTHORITY

MARCHIO PRODUZIONE A04  
 MANUFACTURER'S SYMBOL  
 IML or



CapProducts, Ltd.  
25 Winnipeg St  
Vanastra, ON N0M 1L0

Phoenix \* Capitol \* Camco  
CapProducts

Certified Mill Test Report

Commanding a Higher Standard<sup>sm</sup>

Printed: 9/13/2016  
Customer  
TS & M SUPPLY  
TS & M SUPPLY  
314 KENSINGTON AVE.  
ESTEVAN, SK S4A 2A2

Certified: 08/19/2016  
P.O. 25633159  
Tag

Heat No 1145680  
Heat Code 867K  
Phoenix Order # 1228532

Material ASTM A106-2014 / ASME SA106-2015 Edition

Part Number  
15112005

Description  
2 X 2-1/2" XHSML BK STL NIPL TBE

Chemical Properties

C	Mn	P	S	Si	Cu	Ni	Cr	C Eq. Long		
0.2000	0.8900	0.0110	0.0050	0.2600	0.1500	0.1100	0.0800	0.3847		
Mo	V	Co	Al	Cb	N	Pb	Sn	Ta	Ti	
0.0100	0.0050			0.0100					0.0050	

Additional Chemical Properties


Cr + Cu + Ni
0.3400

Mechanical Properties

Tensile (PSI)	Yield (PSI)	Elong. % in 2 in. or 4D	R of A	HBW	HBW2
80,000	56,000	32.0%	0.0%	0	0

Charpy Minimum Impact - ft/lbs

Test 1	Test 2	Test 3	Average	Test Temp.
N/A	N/A	N/A	N/A	N/A

\* Hydro test passed. at 2500 psi.

\* Bend test passed.

We hereby certify that these parts were manufactured, sampled, tested, and inspected in accordance with the product specifications stated and were found to meet the requirements.

We further certify that this material was inspected using independent inspectors conforming to the requirements of EN 10204 3.1. These products meet the requirements of the latest editions of NACE MR0175, NACE MR0103, and ISO 15156. No weld repair has been performed on these products. This material was not exposed to mercury or any other metal alloy that is liquid at ambient temperatures during processing or while in our possession.

Meets ASME SA 106 Grade B Requirements.  
Manufactured in the USA.



16182-D  
Dec 15/16  
*WUCAL*



**CapProducts, Ltd.**  
25 Winnipeg St  
Vanastra, ON N0M 1L0

**Phoenix \* Capitol \* Camco**  
**CapProducts**

**Certified Mill Test Report**

Commanding a Higher Standard<sub>sm</sub>

Printed: 11/28/2016  
Customer  
TS & M SUPPLY  
TS & M SUPPLY  
314 KENSINGTON AVE.  
ESTEVAN, SK S4A 2A2

Certified: 11/08/2016  
P.O. 25662750  
Tag

Heat No A4355  
Heat Code 86BC  
Phoenix Order # 1243489  
Material ASTM A106-2014 / ASME SA106-2015 Edition

Part Number  
15111008

Description  
1 X 4" XHSML BLK NIPL TBE

**Chemical Properties**

C	Mn	P	S	Si	Cu	Ni	Cr	C Eq. Long	
0.1490	1.2510	0.0170	0.0060	0.2900	0.0110	0.0070	0.0470	0.3691	
Mo	V	Co	Al	Cb	N	Pb	Sn	Ta	Ti
0.0030	0.0020		0.0250	0.0000					0.0020

**Additional Chemical Properties**


Cr + Cu + Ni
0.0650

**Mechanical Properties**

Tensile (PSI)	Yield (PSI)	Elong. % in 2 in. or 4D	R of A	HBW	HBW2
79,200	63,406	33.0%	0.0%	155	0

**Charpy Minimum Impact - ft/lbs**

Test 1	Test 2	Test 3	Average	Test Temp.
N/A	N/A	N/A	N/A	N/A

\* Hydro test passed. at 2500 psi.

We hereby certify that these parts were manufactured, sampled, tested, and inspected in accordance with the product specifications stated and were found to meet the requirements.

We further certify that this material was inspected using independent inspectors conforming to the requirements of EN 10204 3.1. These products meet the requirements of the latest editions of NACE MR0175, NACE MR0103, and ISO 15156. No weld repair has been performed on these products. This material was not exposed to mercury or any other metal alloy that is liquid at ambient temperatures during processing or while in our possession.

Meets ASME SA 106 Grade B Requirements.

**Comments:**

Flattening test passed.



16182-D  
Dec 15/16  
[Signature]



# BOTH-WELL STEEL FITTINGS CO., LTD.

NO.303, REN-SIN ROAD, REN-WU DISTRICT, KAOHSIUNG CITY TAIWAN R.O.C.(81460)  
TEL : (886)7-3711536, 3710497, 3720260 FAX : (886)7-3713864, 3713886  
WEB SITE : <http://www.bothwell.com.tw> E-Mail : [box@bothwell.com.tw](mailto:box@bothwell.com.tw)



## MILL TEST & INSPECTION CERTIFICATE

ACCORDING TO EN 10204 3.1

CUSTOMER : DNOW CANADA ULC  
CERT NO : 142899  
ORDER NO : 7008599

INVOICE NO : 5200002958  
L/C NO :

PAGE : 53  
DATE : 09/20/2014  
ORIGIN : TAIWAN

ITEM	RAW HEAT NO. HEAT CODE	QTY	DESC/GRADE OR SPECIFICATION NO. CHEMICAL COMPOSITION(%) MECHANICAL PROPERTIES. SUPPLIER.
39	342001 4309	1,202 PCS	TEE A105 1" 3000# NPT C:0.20 SI:0.20 MN:0.84 P:0.013 S:0.008 CU:0.16 CR:0.08 NI:0.05 MO:0.01 V:0.002 NB:0.001 CE:0.37 TS(KSI):75.0 YS 0.2%(KSI):52.8 EL(%):35.2 R.A.(%):68.2 HARDNESS1(HBW):146 HARDNESS2(HBW):144

REMARK :

THE MATERIAL SUPPLIED IDENTIFIED AS ASTM A105N -13, ASME SA105N-2013ED  
THE FITTING SUPPLIED IDENTIFIED AS ASME B16.11 - 2011  
THE PRODUCT SUPPLIED WAS INSPECTED IN ACCORDANCE WITH SPECIFICATION(SURFACE & DIM). : GOOD  
FULLY KILLED AND FINE GRAIN PRACTICE

	C	Si	Mn	P	S	Cu	Cr	Ni	Mo	V	Cb(Nb)
MIN	-	0.10	0.60	-	-	-	-	-	-	-	-
MAX	0.35	0.35	1.05	0.035	0.040	0.40	0.30	0.40	0.12	0.08	-
	N	Al	Ti	Zr	CE	TS(KSI)	YS	YS 0.2%(KSI)	EL(%)	R of A(%)	HARDNESS(H)
MIN	-				-	70		36	22	30	-
MAX	-				0.43	-		-	-	-	187

HEAT TREATMENT : NORMALIZED: 900°C (1652°F) A.C.  
STEEL MAKING PROCESS : ELECTRIC FURNACE  
CONFORMS TO NACE MR0175-09/ISO15156-09/MR0103-12



WE CERTIFY THE ABOVE MENTIONED FITTINGS HAVE BEEN MANUFACTURED,  
SAMPLED, TESTED, AND INSPECTED IN ACCORDANCE WITH THE  
SPECIFICATIONS SHOWN

C.C. Huang  
Q.C. MANAGER

C.L. Ko  
INSPECTOR

16182-D  
Dec 5/16  
[signature]



I.M.L. - INDUSTRIA MECCANICA LIGURE S.P.A.  
 Via Giancarlo Farina, 25 - 16030 Casarza Ligure - GE - ITALY  
 Tel. +39 0185 467661 - Fax +39 0185 466510 - E-mail quality.iml@farinagroup.com  
 MATERIAL TEST DEPARTMENT

COMPANY WITH QUALITY  
 SYSTEM ISO 9001: 2008 CERTIFIED  
 BY RINA  
 CERT. N° 23/91/S

INSPECTION CERTIFICATE EN 10204:2004 / 3.1 A02 Nr<sup>A03</sup> 2014-C\_IML-25942 Data / Dated 26.11.2014 Z02

DNOV CANADA ULC 1800, 635-8th Avenue S.W. Calgary, Alberta, Canada T2P 3M3	Ordine / PO	25331611	A07
	Item	1550	
	DDT / Delivery note	2014-2E301-0001368	
	Packing List	2014-2E301-0001368	
	Fattura / Invoice	2014-2E401-0001298	A08
	Ns. rif. / Our ref.	2014-2E201-0001184-0155	

Dest. UMB CA AB EDMONTON DC - DNOV CANADA ULC A06  
 2603 -76 AVENUE  
 T6P 1P6 EDMONTON - ALBERTA CA

Cod. colata Heat Code	Nr. colata Heat Nr	Quantità Quantity	Descrizione Description
TE7	11/79390	650,00	FITTING TEE THRD NPT 3M 1/2" A105N

Mat. in acc. a / Mat. in acc. to B02 ASME SA ASTM A105-13  
 NACE MR 0175 - ISO 15156 Ed. 2009 / NACE MR 0103 Ed. 2012  
 P.E.D. 97/23/EC ANNEX 1 PAR. 4.3

Ann. mat. / Mat. remarks B02 MATERIAL FULLY KILLED & FINE GRAIN PRACTICED

Elementi / Elements	C	Si	Mn	S	P	Cr	Ni	Mo	Ti	Cu	V	Nb	N
LADLE ANALYSIS	0,180	0,260	1,120	0,010	0,012	0,100	0,060	0,020	0,022	0,180	0,003	0,002	0,000
LADLE ANALYSIS	0,031								0,407	0,367	0,363	0,120	--

Provetta Test specimen	Forma Shape	°C <sup>C03</sup>	Snervamento > 0,2% Yield Strength > 0,2%	Snervamento > 1,0% Yield Strength > 1,0%	Rottura Tensile	Allungamento Elongation	Contrazione Reduction of area	
122,65	50,00	1	20	331,0	--	528,0	34,6	57,3

DUREZZA / HARDNESS	RESILIENZA / IMPACT TEST
HBW	Tipo/Type
164,0 - 169,0	KV

Tratt. Term. / Heat treatment 070 Normalized at 880°-920°C / Air Cool ELECTRIC FURNACE

Dim in acc. a / Dim. acc. to B14 ASME B16.11 Ed.2011 - ASME B1.20.1 Ed.2013 - MSS SP25 Ed.2013

Marcatura in acc. / Marking in acc. to B06 MSS SP25 Ed. 2013	Vis. & Dim.	SATISFACTORY	Origine / Origin of Steel	EUROPEAN UNION
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Note / Notes 100% MANUFACTURED IN ITALY  
 SUPPLIED MATERIAL MEETS SPECIFICATIONS AND P.O. REQUIREMENTS



16182-D  
 Dec 15/16  
 UML

UFFICIO CONTROLLO QUALITA' / QUALITY CONTROL DEPARTMENT A05  
 Bows [signature]

ENTE UFFICIALE DI COLLAUDO / INSPECTION AUTHORITY Z03

MARCHIO PRODUZIONE / MANUFACTURER'S SYMBOL A04  
 IML or



# WESTBROOK

## MATERIAL TEST REPORT

1111 LOCKWOOD DR.  
HOUSTON, TX 77020

Voice 713 675 6438  
Fax 713 675 9742

To: WESTBROOK CANADA LTD  
Order No.: 680203 Order Date: 10/21/2016

Purchase Order: 801912/137881  
Tag Number: DNOW PO# 25650983 AB01 EDMONTON DC  
Printed: 11/03/2016

Line: Description:  
15 1 X 1/4 S80 A234WPBN SP95 BLK CONC SWG  
TBE

\*\*\*\*\* Specifications - Heat Code W22242 ZE: \*\*\*\*\*  
A105/A105M-14, SA105, A234-14 WPB, SA234 WPB, ASME B16.5,  
B16.9, B16.11, B16.36, B1.20.1, MSS SP-25, SP-44, SP-79,  
SP-83, SP-95, API-605, A.W.W.A.  
STARTING MATERIAL: BAR/BILLET/FORGING  
A234-14 WPBN, SA234 WPBN

### Chemical Composition:

C:	Mn:	P:	S:	Si:	Cr:	Ni:	Mo:
0.250	0.650	0.009	0.006	0.200	0.110	0.050	0.010
Cu:	V:	Cb:	C.E.:				
0.110	0.004	0.010	.393				

### Mechanical Properties:

Tensile(PSI):	Yield(PSI):	Elong(%):	RA(%):	Hardness:
73244	45687	30.50	60.50	HRB 77-80.

### Comments:

Normalized 1600F for 10-15 minutes then still air cooled.  
Cold drawn.  
Meets Nace MR-01-75/2009, MR-01-03/2010, and ISO 15156/2009.



16182-D  
Dec 15/16  
*Umap*

We hereby certify that the contents of this Material Test Report are correct and accurate to the best of our knowledge and belief, that all test results are in compliance with the material specifications and that all material meets the dimensional requirements of the order. The products described have not come into contact with mercury or any of its components. No weld repair performed. Westbrook's Quality System is registered to ISO 9001, Certificate #32813. This document is in accordance with EN10204:2004 3.1/DIN50049 3.1B and was electronically transmitted. This inspection certificate is issued under the authority of Westbrook's QA Manager.



CapProducts, Ltd.  
25 Winnipeg St  
Vanastra, ON N0M 1L0

Phoenix \* Capitol \* Camco  
CapProducts

Commanding a Higher Standard<sub>sm</sub>

**Certified Mill Test Report**

Printed: 9/13/2016  
Customer  
TS & M SUPPLY  
TS & M SUPPLY  
314 KENSINGTON AVE.  
ESTEVAN, SK S4A 2A2

Certified: 09/06/2016  
P.O. 25633159  
Tag

Heat No 2634K  
Heat Code 84U3  
Phoenix Order # 1228532  
Material ASTM A106-2014 / ASME SA106-2015 Edition

Part Number  
15112007

Description  
2 X 3-1/2" XHSM L BK STL NIPL TBE

Chemical Properties

C	Mn	P	S	Si	Cu	Ni	Cr	C Eq. Long	
0.1600	0.8200	0.0170	0.0050	0.2600	0.1500	0.0810	0.1300	0.3449	
Mo	V	Co	Al	Cb	N	Pb	Sn	Ta	Ti
0.0260	0.0083		0.0280	0.0014			0.0080		0.0023

Additional Chemical Properties


Cr + Cu + Ni
0.3610

Mechanical Properties

Tensile (PSI)	Yield (PSI)	Elong. % in 2 in. or 4D	R of A	HBW	HBW2
72,810	48,350	37.6%	0.0%	0	0

Charpy Minimum Impact - ft/lbs

Test 1	Test 2	Test 3	Average	Test Temp.
N/A	N/A	N/A	N/A	N/A

\* Hydro test passed. at 2500 psi.

\* Bend test passed.

We hereby certify that these parts were manufactured, sampled, tested, and inspected in accordance with the product specifications stated and were found to meet the requirements.

We further certify that this material was inspected using independent inspectors conforming to the requirements of EN 10204 3.1. These products meet the requirements of the latest editions of NACE MR0175, NACE MR0103, and ISO 15156. No weld repair has been performed on these products. This material was not exposed to mercury or any other metal alloy that is liquid at ambient temperatures during processing or while in our possession.

Meets ASME SA 106 Grade B Requirements.  
Manufactured in the USA.



*16182-D*  
*DeS116*  
*JMC*

# BOTH-WELL STEEL FITTINGS CO., LTD.

NO.303, REN-SIN ROAD, REN-WU DISTRICT, KAOHSIUNG CITY TAIWAN R.O.C.(81460)  
 TEL : (886)7-3711536, 3710497, 3720260 FAX : (886)7-3713864, 3713886  
 WEB SITE : http://www.bothwell.com.tw E-Mail : box@bothwell.com.tw



## MILL TEST & INSPECTION CERTIFICATE ACCORDING TO EN 10204 3.1

CUSTOMER : DNOW CANADA ULC  
 CERT NO : 150470  
 ORDER NO : 7009532

INVOICE NO : 5200004642  
 L/C NO :

PAGE : 39  
 DATE : 02/17/2015  
 ORIGIN : TAIWAN

ITEM	RAW HEAT NO. HEAT NO	QTY	DESC/GRADE OR SPECIFICATION NO. CHEMICAL COMPOSITION(%) MECHANICAL PROPERTIES. SUPPLIER.
42	0097105 4235	585 PCS	90D ELBOW A105 1/4" 3000# NPT C:0.19 SI:0.19 MN:0.92 P:0.019 S:0.006 CU:0.16 CR:0.08 NI:0.06 MO:0.01 V:0.001 NB:0.001 N:- TI:0.001 CE:0.38 TS(KSI):78.7 YS 0.2%(KSI):55.7 EL(%):34.0 R.A.(%):66.4 HARDNESS1(HBW):143 HARDNESS2(HBW):145

REMARK :  
 THE MATERIAL SUPPLIED IDENTIFIED AS ASTM A105N -13, ASME SA105N-2013ED  
 THE FITTING SUPPLIED IDENTIFIED AS ASME B16.11 - 2011  
 THE PRODUCT SUPPLIED WAS INSPECTED IN ACCORDANCE WITH SPECIFICATION(SURFACE & DIM) : GOOD  
 FULLY KILLED AND FINE GRAIN PRACTICE

	C	Si	Mn	P	S	Cu	Cr	Ni	Mo	V	Cb(Nb)
MIN	-	0.10	0.60	-	-	-	-	-	-	-	-
MAX	0.35	0.35	1.05	0.035	0.040	0.40	0.30	0.40	0.12	0.08	-
	N	Al	Ti	Zr	CE	TS(KSI)	YS	YS 0.2%(KSI)	EL(%)	R of A(%)	HARDNESS(HBW)
MIN	-				-	70		36	22	30	-
MAX	-				0.43	-		-	-	-	187

HEAT TREATMENT : NORMALIZED: 900°C (1652°F) A.C.  
 STEEL MAKING PROCESS : ELECTRIC FURNACE  
 CONFORMS TO NACE MRO175-09/ISO15156-09/MRO103-12


WE CERTIFY THE ABOVE MENTIONED FITTINGS HAVE BEEN MANUFACTURED,  
 SAMPLED, TESTED, AND INSPECTED IN ACCORDANCE WITH THE  
 SPECIFICATIONS SHOWN

*C.C. Huang*  
 Q.C. MANAGER

*C.L. Ko*  
 INSPECTOR

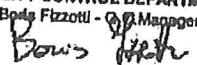

*16182-D*  
*Dec 15/16*  
*Umap*



 <b>I.M.L. - INDUSTRIA MECCANICA FIGURE S.P.A.</b> Via Giancarlo Farina, 25 - 16030 Casazza Ligure - GE - ITALY Tel. +39 0185 467661 - Fax +39 0185 468510 - E-mail quality@imlitaly.com MATERIAL TEST DEPARTMENT		<b>COMPANY WITH QUALITY SYSTEM ISO 9001: 2008 CERTIFIED BY IRMA CERT. N° 23/91/8</b>	
<b>INSPECTION CERTIFICATE EN 10204:2004 / 3.1</b>			
<b>FORGED FLANGES &amp; FITTINGS LTD</b> UNIT 24 - WROTHAM BUSINESS PARK - WROTHAM PARK BARNET - HERTFORDSHIRE - EN5 4SZ - UNITED KINGDOM GB		Nr <sup>403</sup> 2016-C_JML-28501 Data / Dated 14.10.2016 200	
Dest. FFF CANADA 1811 - 66th AVENUE, NW. EDMONTON, ALBERTA T8P 1M5 CA		Ordine / PO 4180C Item 51 DDT / Delivery note 2016-2E301-0001189 Packing List 2016-2E301-0001189 Fattura / Invoice 2016-2E401-0001113 Na. rif. / Our ref. 2016-2E201-0001513-0051	
Cod. colata <sup>807</sup> Heat Code H5	Nr. colata <sup>807</sup> Heat Nr 1677186	Quantità <sup>808</sup> Quantity 1.248,00	Descrizione <sup>809 (009 - 011)</sup> Description FITTING 90 ELB. THRD NPT 3M 1" A350/LF2 No. 104 boxes 12 pcs/box Package 287
Mat. in acc. a / Mat. in acc. to <sup>802</sup> ASTM A350/A350M-15 Gr. LF2 cl.1 ABME SA350/SA350M Gr. LF2 cl.1, ASME II PART A Ed.2016 ANSI/NACE MR 0175 - ISO 15168 Ed.2015 / NACE MR 0103 Ed. 2012 P.E.D. 97/23/EC ANNEX 1 PAR. 4.3			
Ann. mat. / Mat. remarks <sup>803</sup> MATERIAL FULLY KILLED & FINE GRAIN PRACTICED MATERIAL IS FREE FROM MERCURY CONTAMINATION & RADIATION			
Element / Elements <sup>(71 - 024)</sup> C Si Mn S P Cr Ni Mo Ti Cu V Nb N LADLE ANALYSIS 0,185 0,200 1,080 0,008 0,015 0,110 0,050 0,010 0,017 0,180 0,003 0,001 0,000 LADLE ANALYSIS 0,025 CE LF CE SF F1 F2 PREN 0,404 0,365 0,333 0,120 0,143			
CE LF=C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15 CE SF=C+(Mn/6) F1=Cu+Ni+Cr+Mo+V F2=Cr+Mo			
Provetta Forma <sup>610</sup> °C <sup>603</sup> Snervamento <sup>611</sup> Snervamento <sup>611</sup> Rottura <sup>612</sup> Allungamento <sup>613</sup> Contrazione <sup>614</sup> Test specimen Shape Yield Strength <sup>611</sup> Yield Strength <sup>611</sup> Tensile Elongation Reduction of area Sec/Spec mm2 L mm 1=0-2=□ MPa MPa MPa % % 122,65 50,00 1 20 344,0 - 521,0 32,8 59,0			
DUREZZA / HARDNESS <sup>602</sup> HBW Tipo/Type <sup>604</sup> Provetta / Test Specimen °C <sup>603</sup> 1-Joule <sup>604</sup> 2-Joule <sup>604</sup> 3-Joule <sup>604</sup> Media/Average <sup>605</sup> 155,0 - 158,0 KV 10x10mm -50 65 83 60 62,7			
Tratt. Term. / Heat treatment <sup>606</sup> Normalized at 800°C / Air Cool ELECTRIC FURNACE			
Dim in acc. a / Dim. ecc. to <sup>607</sup> ASME B16.11 Ed.2011 - ASME B1.20.1 Ed.2013 - MSS SP25 Ed.2013			
Marcatura in acc. <sup>608</sup> Marking in acc. to	MSS SP25 Ed. 2013	Via. & Dim. SATISFACTORY	Origine Origin of Steel
Note / Notes 100% MANUFACTURED IN ITALY SUPPLIED MATERIAL MEETS SPECIFICATIONS AND P.O. REQUIREMENTS			



VERIFIED TRUE COPY OF ORIGINAL FORGED FLANGES & FITTINGS LIMITED

UFFICIO CONTROLLO QUALITA' QUALITY CONTROL DEPARTMENT Paolo Fizzotti - Quality Manager 	ENTE UFFICIALE DI COLLAUDO INSPECTION AUTHORITY	MARCHIO PRODUZIONE MANUFACTURER'S SYMBOL IML or 
---	--	---

16182-D  
 Dec 15/16  
 [Signature]

## INSPECTION CERTIFICATE Certificato d'ispezione



<b>REPORT N.</b> Rapporto N.	TC-012007-13-0001	<b>Issued on</b> Emesso il	21/01/2014	<b>Customer</b> Cliente	CE FRANKLIN, A DIVISION OF NOV WILSON CANADA ULC 1800,635 - 8th AVENUE SW CALGARY, ALBERTA, T2P 3M3 - CANADA	<b>Job n.</b> Commessa n.	12007	<b>Page n.</b> Pagina n.	3 of 18
<b>Revision</b> Revisione	0	<b>According to</b> In accordo a	EN 10204:2005	<b>Type</b> Tipo	3.1	<b>Purchase order</b> Ordine	3335663-OR-2100		

Test Prova	Item Pos.	Qty Q.tà	Customer code Codice cliente	Material Materiale	Heat Colata	DESCRIPTION / DESCRIZIONE	Product Prodotto
VRSX	14	232	1090562	ASTM A105/12	12/73926	90 DEG. ELBOW S. 3000 NPT A/SA105N 3/4	
VTTA	14	8	1090562	ASTM A105/11	12/72431	90 DEG. ELBOW S. 3000 NPT A/SA105N 3/4	
VXDC	14	30	1090562	ASTM A105/12	12/73109	90 DEG. ELBOW S. 3000 NPT A/SA105N 3/4	
VTSL	15	510	1096331	ASTM A105/12	P4121241103	90 DEG. ELBOW S. 3000 NPT A/SA105N 1	
VNFC	16	104	1096374	ASTM A105/11	12/71914	90 DEG. ELBOW S. 3000 NPT A/SA105N 1.1/2	

**HEAT TREATMENT DATA AND REFERENCES TO OTHER CERTIFICATES /** Dettagli di trattamento termico e riferimenti ad altri certificati

VRSX	MATERIAL PRODUCED BY ELECT.FURNACE-NORMALIZED AT 900 C COOLED IN STILL AIR. /CERT.72.EVASI*592512MEGA
VTTA	MATERIAL PRODUCED BY ELECT.FURNACE-NORMALIZED AT 880 C COOLED IN STILL AIR. /CERT.12684.MEGA/I*591528MEGA
VXDC	MATERIAL PRODUCED BY ELECT.FURNACE-NORMALIZED AT 900 C COOLED IN STILL AIR. /CERT.199.EVASI*0079MEGA
VTSL	MATERIAL PRODUCED BY ELECT.FURNACE-NORMALIZED AT 880 C COOLED IN STILL AIR. /CERT.12873.MEGA/I*0076MEGA
VNFC	MATERIAL PRODUCED BY ELECT.FURNACE-NORMALIZED AT 920 C COOLED IN STILL AIR. /CERT.878+900+906+942_CARLOTTO*588450MEGA

Test Prova	Test loc. Preso a	Orient. Direz.	TENSILE TEST / Trazione							CVN (KV) / Prova di resilienza					Bend Piega	Flatten. Schiacc.	Hardness Durezza [HBN]
			Specimen / Provino			Yield strength	Tensile strength	Elongation	Red. Of Area	Dimens.	T	Abs. Energy	Shear A	Lat Exp			
			Shape Forma	A [mm <sup>2</sup> ] Sezione	L [mm] Lungh.	Snerg. [Mpa] Min:	Rottura [Mpa] Min:	Allung. [%] Min:	Contraz. [%] Min:	Dimens. [mm]	Temp. [°C]	Energia ass. [J]	Area d [%]	Esp. Lat. [mm]			
VRSX	T/2	LONG	Round	30.700	25.000	342.100	531.300	35.700	65.100	10x10x55	0	159-77-145	--	---		141-143	
VTTA	T/2	LONG	Round	30.900	25.000	321.100	499.400	36.000	62.300	10x10x55	0	88-96-84	--	---		141-143	
VXDC	T/2	LONG	Round	30.200	25.000	317.000	514.000	36.300	69.000	10x10x55	0	93-95-144	--	---		141-143	
VTSL	T/2	LONG	Round	30.800	25.000	291.900	501.300	42.100	74.000	10x10x55	0	165-173-131	--	---		141-143	
VNFC	T/2	LONG	Round	59.200	35.000	322.800	502.700	37.800	63.700	10x10x55	0	56-63-78	--	---		143-145	

Test Prova	C [%]	Si [%]	Mn [%]	S [%]	P [%]	Cr [%]	Ni [%]	Mo [%]	Ti [%]	Cu [%]	V [%]	Al [%]	Co [%]	Nb [%]	N [%]	Sn [%]	W [%]	B [%]	Fe [%]	Zr [%]	CE <sup>A</sup> [%]	PREN <sup>B</sup> [%]	X fact. <sup>C</sup> [%]	J fact. <sup>D</sup> [%]	
VRSX	0.1800	0.2400	0.8700	0.0100	0.0090	0.0600	0.0500	0.0100	0.0190	0.1200	0.0180	0.0250		0.0010		0.0080						0.3539			
VTTA	0.1800	0.2100	0.8600	0.0060	0.0130	0.1500	0.0900	0.0200	0.0160	0.2200	0.0160	0.0200		0.0020		0.0090						0.3811			
VXDC	0.1800	0.2000	0.8900	0.0060	0.0110	0.1000	0.0700	0.0200	0.0170	0.1600	0.0150	0.0220		0.0010		0.0100						0.3706			
VTSL	0.1700	0.2150	1.0200	0.0050	0.0150	0.1550	0.0400	0.0090		0.1100	0.0050	0.0240		0.0024				0.0002				0.3838			
VNFC	0.1700	0.2000	0.9000	0.0100	0.0120	0.1100	0.0500	0.0100	0.0200	0.1300	0.0240	0.0240		0.0010		0.0070						0.3608			

**REMARKS / Note**  
1: MATERIAL ACCORDING TO NACE MR0175/ISO 15156-1-2-3 Ed.2009 + NACE MR0103/2010 AND ASME SA SPECIFICATIONS

A: CE = C + Mn/6 + (Cr+Mo+V)/5 + (Cu+Ni)/15 | B: PREN = Cr + 3.3Mo + 16N  
 C: X factor = (10P + 5Sb+4Sn+As)/100 - elements expressed in ppm  
 D: J factor = (( Mn + Si ) ( P + Sn )) x 104

Quality control laboratory  
Laboratorio controllo qualità

Emmanuel Centemeri

**Intertek**  
Reviewed  
Initial: [Signature]  
Date: 01/17/17  
CA-0077

16182-D  
Dec 15/16  
UICM

This certificate is issued by a computerized system and it is valid with electronic signature. On the original certificate the trademark M.E.G.A. is printed in green color.

HENGYANG VALIN STEEL  
TUBE CO., LTD

# MILL TEST REPORT

Add: 10 Dalixincun, Mengyang City, Hunan, P. R. China P. C. :421001

Tel and Fax: +86 734 8873739

E-mail: hsiiec@hysteeltube.com

(ACCORDING TO EN10204 3.1)

CUSTOMER	CE FRANKLIN			CERTIFICATE NO.	C201341053-1				
CONTRACT NO.	2111000893	P.O.NO.	PO.3282109-OR-2100-A	L/C NO.:	3FAHD5-00778	DATE:	2013-11-18	PAGE:	1/3
PRODUCT	SEAMLESS CARBON STEEL PIPE FOR OIL AND GAS USE.			DELIVERY CONDITION	N				
SPECIFICATION	SEE SPECIFICATION NOTE		HEAT TREATMENT						
GRADE	B.X42			DIMENSIONS	1"*0.179"*20FT				
TOTAL BUNDLES:	18	TOTAL PIECES:	1646	TOTAL LENGTH:	32941.60	FT	TOTAL WEIGHT:	32.539	MT

NO.	LOT No.	HEAT No.	BUNDLES	PIECES	LENGTH FT	WEIGHT MT	TENSILE TEST ASTM A370					COLD BENDING TEST
							SAMPLE TYPE/ ORIENTATION / SIZE(mm)/GAUGE LENGTH(mm):FL\50					
							TS(Psi)	YS(Psi)	Rt0.5	EL(%)	R.A. (%)	
1	513961271	1314438	18	1646	32941.60	32.539	66845	46400	41.0	0.69	ACCEPTABLE	

NO.	IMPACT TEST								NON METALIC INCLUSION	GRAIN SIZE	HARDNESS TEST	
	NOTCH TYPE/ORIENTATION/TEMPERATURE(°C)/SIZE (mm) :										NACE MR0175	
	AK1 (J)	Av. (J)	% SHEAR AREA	LE	AK2 (J)	Av. (J)	% SHEAR AREA	LE			HRC	
1	/				/					/1.0/1.0/1.0////////		

NOTES:

W1--THEORETICAL WEIGHT

W2--ACTUAL WEIGHT

NR--NORMALIZING ROLLED

AK1--ABSORB ENERGY FOR THE FIRST SET

SAMPLE ORIENTATION : L--LONGITUDINAL T--TRANSVERSE

SAMPLE TYPE: S---STRIP C-- CLUBBED F--FULL-SECTION

Q&T--QUENCHING AND TEMPERING

AK2--ABSORB ENERGY FOR THE SECOND SET

N--NORMALIZING

A--ANNEALING

Av.--AVERAGE

LE--SIDE EXPANSION

HE--HOT EXPANDED

HR--HOT ROLLED

N&T--NORMALIZING AND TEMPERING

16182-D  
Dec 15/16  
VMAO





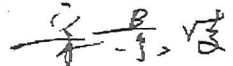
HENGYANG VALIN STEEL  
TUBE CO., LTD

# MILL TEST REPORT

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

(ACCORDING TO EN10204 3.1)

CUSTOMER	CE FRANKLIN			CERTIFICATE NO.	C201341053-1				
CONTRACT NO.	2111000893	P.O.NO.	PO.3282109-OR-2100-A	L/C NO.:	3FAHD5-00778	DATE:	2013-11-18	PAGE:	3/3
PRODUCT	SEAMLESS CARBON STEEL PIPE FOR OIL AND GAS USE.				DELIVERY CONDITION	N			
SPECIFICATION	SEE SPECIFICATION NOTE		HEAT TREATMENT						
GRADE	B.X42				DIMENSIONS	1"*0.179"*20FT			
TOTAL BUNDLES:	18	TOTAL PIECES:	1646	TOTAL LENGTH:	32941.60	FT	TOTAL WEIGHT:	32.539	MT
		REMARK : 1.ORIGIN:MADE IN CHINA;2.ALL ELEMENTS TO BE LISTED;							

SPECIFICATION NOTE	ASTM A53B-2012/A106B-2011, ASME SA53B/SA106B-2010, API 5LB, PSL1 45TH EDITION, NACE MR-0175-2009 (FOR HARDNESS ONLY)	
<p>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.</p> <p>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.</p> <p>Any alteration and/or falsification will be subject to the law.</p> <p>If you need to assure the authenticity of this certificate, please do not hesitate to contact Hengyang Valin Steel Tube CO., LTD, E-mail: hsiec@hysteeltube.com</p>		<p>Quality Manager: </p> <p>Certificate-maker: 曾黎明</p>
CUSTOMER THIRD PARTY		

正 本  
ORIGINAL



16182-D  
Dec 15/16  
UNED





1/2" XH SEAMLESS CS PIPE  
A108 GR B PE . SRL

HENGYANG VALIN  
STEEL TUBE CO.,LTD

MILL TEST REPORT

Add: 10 Dalixincun, Hengyang City, Hunan, P.R.China P.C.:421001

Tel and Fax: +86 734 8873739

E-mail: hsrcc@hysteeltube.com

(ACCORDING TO EN10204 3.1)

CUSTOMER		TRANS AM		CERTIFICATE NO.		YCHYST2014085-01	
CONTRACT NO.	2111001403-2	P.O.NO.	PO.CI-14-535-A (LOT B)	L/C NO.:	4FAHD5-00816	DATE:	2015-1-20
PRODUCT		SEAMLESS CARBON STEEL PIPE FOR OIL AND GAS USE.		DELIVERY CONDITION		PAGE: 1/3	
SPECIFICATION		ASTM A53B-2012/A106B-2013, ASME SA53B/SA106B-2013, API 5LBN PSL-2 45TH EDITION, NACE MR-0175-2011/ISO 15156-2(REGION 3)-2009 /MR-0103-2012/SS (CSA Z245.1 GRADE 241 CATEGORY 1-2014)		HEAT TREATMENT		> 850°C	
GRADE		H. BN. GRADE 241		DIMENSIONS		1/2" x 0.147" x 20ft	
TOTAL BUNDLES:		TOTAL PIECES:		TOTAL LENGTH:		TOTAL WEIGHT:	
				ft		mt	

NO.	BATCH No.	HEAT No.	BUNDLES	PIECES	LENGTH ft	WEIGHT ml W1	TENSILE TEST ASTM A370					COLD BENDING TEST	
							SAMPLE TYPE/ ORIENTATION / SIZE(mm)/GAUGE LENGTH(mm):FL150						
							TS(psi)	YS(psi)	RT0.5	EL(%)	R.A. (%)	YS/TS	
I	WL1410-115	W11409489					66410	43645		33.0		0.66	ACCEPTABLE

NO.	IMPACT TEST								NON METALLIC INCLUSION	GRAIN SIZE	HARDNESS TEST NACE MR0175/ISO 15156-2(REGION 3)/YMR0103 HV10
	NOTCH TYPE/ORIENTATION/TEMPERATURE(°C)/SIZE (mm):										
///				///							
AK1 (J)	Av.(J)	% SHEAR AREA	LE	AK2 (J)	Av.(J)	% SHEAR AREA	LE				
I	/			/						1157.31	

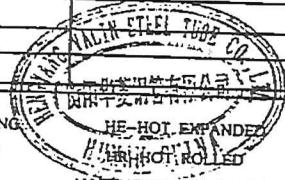
NOTES:  
W1-THEORETICAL WEIGHT  
W2-ACTUAL WEIGHT  
NR-NORMALIZING ROLLED  
AK1-ABSORB ENERGY FOR THE FIRST SET

SAMPLE ORIENTATION: L-LONGITUDINAL T-TRANSVERSE  
SAMPLE TYPE: S-STRIP C- CLUBBED F-FULL-SECTION  
Q&T-QUENCHING AND TEMPERING  
AK2-ABSORB ENERGY FOR THE SECOND SET

N-NORMALIZING  
A-ANNEALING  
Av.-AVERAGE  
LE-SIDE EXPANSION

HE-HOT EXPANDED  
N&T-NORMALIZING AND TEMPERING

**Intertek**  
 Reviewed  
 Witnessed  
Initial: [Signature]  
Date: 01/09/17  
CA-0077



CE Franklin PO# 650083096-AB42 Item# 2  
Heat Number: W11408488  
Trans Am Piping Products Ltd. - Rev'd BY: SB  
Shipment/Seq #: 9 15 - 1308

HENGYANG VALIN  
STEEL TUBE CO.,LTD

# MILL TEST REPORT

Add: 10 Dalixincun, Hengyang City, Hunan, P.R.China P.C.:421001

Tel and Fax: +86 734 8873739

E-mail: hsiiec@hysteel.com

(ACCORDING TO EN10204 3.1)

CUSTOMER	TRANS AM		CERTIFICATE NO.	YCHYST2014085-01	
CONTRACT NO.	2111001403-2	P.O.NO.	PO CH-14-535-A (LOT B)	L/C NO.: 4FAHD5-00816	DATE: 2015-1-20
PRODUCT	SEAMLESS CARBON STEEL PIPE FOR OIL AND GAS USE		DELIVERY CONDITION	N(CD)	
SPECIFICATION	ASTM A53B-2012/A106B-2013, ASME SA53B/SA106B-2013, API 5LBN PSL-2 45TH EDITION, NACE MR-0175-2011/ISO 15156-2(REGION 3)-2009 /MR-0103-2012/SS (CSA 2245.1 GRADE 241 CATEGORY 1-2014)		HEAT TREATMENT	>850°C	
GRADE	B, BN, GRADE 241		DIMENSIONS	1/2" x 0.147" x 20ft	
TOTAL BUNDLES:	TOTAL PIECES:	TOTAL LENGTH:	TOTAL WEIGHT:		

NO	HEAT No. BATCH No.	Type	CHEMICAL COMPOSITION (%)																		SUM1	SUM2	SUM3	R1	R2	R3							
			C	Si	Mn	Cr	Mo	W	Cu	Ni	P	Al	Sn	As	Pb	Sb	Nb	Ti	Zr	N							Bi	S	V	B	Ca	CE	
		P	*1000																		*10000	*100	*1000										
1	W11409489	H	13	26	105	20	4	20	10	7	41																						
	WL1410-115	P	12	27	104	21	4	20	12	6	42					29	28			8	20	30	1	15	31	57	32	60			8.1		
	WL1410-115	P	12	27	104	21	4	20	10	6	42					28	28			6	22	25	2	15	30	60	30.5	58.5			8.7		
		H													28	28			5	22	23	3	13	30	57	30.3	58.3			8.7			
		P																															
		P																															
		H																															
		P																															
		H																															
		P																															
		H																															
		P																															
		H																															

NON-DESTRUCTIVE TEST				
POSITION	PIPE BODY	PIPE END	END SURFACE(GROOVE)	PE
NDT Type(Level)	UT(L2)	UT(L2)		ACCEPTABLE
LAMINAR				VISUAL & DIMENSION
TEST RESULT	ACCEPTABLE	ACCEPTABLE	N/A	ACCEPTABLE
RESIDUAL MAGNETISM	≤20 GS			
UT THICKNESS MEASUREMENT		ACCEPTABLE		
HYDROSTATIC TEST	Min(psi/s)	2500/6	N/A	

NOTES: H-HEAT ANALYSIS P-PRODUCT ANALYSIS CE-EQUIVALENT CARBON R-RATIO R1=Ca /S R2=Al/S R3=Mn /C  
 CE=(W=C+Mn/5+Cr+Mo+V)/5+(Cu+Ni)/15 CEPCM=C+Si/20+(Mn+Cr+Cu)/20+Ni/60+Mo/15+W/10+5P SUM1=C+Cu+Mo+Ni+V SUM2=Nb+V SUM3=Nb+W+Ti  
 ET-ISO10893-2-2011, UT-ISO10893-10-2011, MPI-ISO10893-5-2011, EMI-ISO10893-3-2011, WT-ISO10893-12-2011, Lamination T-ISO-10893-8-2011  
 L4/L3/L2-ACCEPT LEVEL L4/L3/L2,NOTCH DEPTH IS 12.5%/10%/5% THE SPECIFIED WALL THICKNESS.



**Intertek**  
 Reviewed  
 Witnessed  
 Initial: *[Signature]*  
 Date: 01/09/17  
 CA - 0077

HENGYANG VALIN  
STEEL TUBE CO.,LTD

# MILL TEST REPORT

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

(ACCORDING TO EN10204 3.1)

CUSTOMER	TRANS AM			CERTIFICATE NO.	YCHYST2014085-01	
CONTRACT NO.	2111001403-2	P. O. NO.	PO.CI-14-535-A (LOT B)	L/C NO.: 4FAHD5-00816	DATE:	2015-1-20 PAGE: 3/3
PRODUCT	SEAMLESS CARBON STEEL PIPE FOR OIL AND GAS USE.			DELIVERY CONDITION	N(CD)	
SPECIFICATION	ASTM A53B-2012/A106B-2013, ASME SA53B/SA106B-2013, API 5LBN PSL-2 45TH EDITION, NACE MR-0175-2011/ISO 15156-2(REGION 3)-2009 /MR-0103-2012/SS (CSA Z245.1 GRADE 241 CATEGORY I-2014)		HEAT TREATMENT	>850℃		
GRADE	B, BN, GRADE 241			DIMENSIONS	1/2" x 0.147" x 20R	
TOTAL BUNDLES:	TOTAL PIECES:		TOTAL LENGTH:		R	TOTAL WEIGHT: mt
			REMARK : 1. Origin: made in china; 2. All elements to be listed; 3. Pipe produced from "fully killed" steel. 4. Silicon and calcium treated for inclusion morphology control in steel melting. 5. Billet produced by: HENGYANG VALIN STEEL TUBE Co., Ltd			

--	--	--


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: hsiiec@hysteeltube.com

CUSTOMER THIRD PARTY

Quality Manager: 



Certificate-maker: 曹永泉

**Intertek**

Reviewed  
 Witnessed

Initial:   
Date: 01/09/17  
CA - 0077



**CapProducts, Ltd.**  
25 Winnipeg St  
Vanastra, ON N0M 1L0

**Phoenix \* Capitol \* Camco**  
**CapProducts**

**Certified Mill Test Report**

*Commanding a Higher Standard<sup>sm</sup>*

Printed: 11/28/2016  
Customer  
TS & M SUPPLY  
TS & M SUPPLY  
314 KENSINGTON AVE.  
ESTEVAN, SK S4A 2A2

Certified: 11/02/2016  
P.O. 25662750  
Tag

Heat No A3080  
Heat Code 86BA  
Phoenix Order # 1243489

Material ASTM A106-2014 / ASME SA106-2015 Edition

Part Number  
15112008

Description  
2 X 4" XHSML BK STL NIPL TBE

**Chemical Properties**

C	Mn	P	S	Si	Cu	Ni	Cr	C Eq. Long	
0.1600	0.8300	0.0140	0.0050	0.2400	0.0060	0.0370	0.0320	0.3088	
Mo	V	Co	Al	Cb	N	Pb	Sn	Ta	Ti
0.0040	0.0020		0.0310	0.0000					0.0020

**Additional Chemical Properties**

					Cr + Cu + Ni	
					0.0750	

**Mechanical Properties**

Tensile (PSI)	Yield (PSI)	Elong. % in 2 in. or 4D	R of A	HBW	HBW2
76,899	68,122	30.6%	0.0%	144	0

**Charpy Minimum Impact - ft/lbs**

Test 1	Test 2	Test 3	Average	Test Temp.
N/A	N/A	N/A	N/A	N/A

\* Hydro test passed. at 2500 psi.

We hereby certify that these parts were manufactured, sampled, tested, and inspected in accordance with the product specifications stated and were found to meet the requirements.  
We further certify that this material was inspected using independent inspectors conforming to the requirements of EN 10204 3.1. These products meet the requirements of the latest editions of NACE MR0175, NACE MR0103, and ISO 15156. No weld repair has been performed on these products. This material was not exposed to mercury or any other metal alloy that is liquid at ambient temperatures during processing or while in our possession.

Meets ASME SA 106 Grade B Requirements.

**Comments:**

Flattening test passed.



16182-D  
Dec 15/16  
Dnep



**CapProducts, Ltd.**  
25 Winnipeg St  
Vanastra, ON N0M 1L0

**Phoenix \* Capitol \* Camco**  
**CapProducts**

**Certified Mill Test Report**

Commanding a Higher Standard™

Printed: 6/2/2016  
Customer  
TS & M SUPPLY  
TS & M SUPPLY  
314 KENSINGTON AVE.  
ESTEVAN, SK S4A 2A2

Certified: 04/18/2016  
P.O. 25592453  
Tag

Heat No 1150397  
Heat Code 84XZ  
Phoenix Order # 1206411  
Material ASTM A106-2014 / ASME SA106-2015 Edition

Part Number  
15112010

Description  
2 X 5" XHSML BK STL NIPL TBE

**Chemical Properties**

C	Mn	P	S	Si	Cu	Ni	Cr	C Eq. Long	
0.1800	0.4600	0.0080	0.0050	0.2400	0.1800	0.1200	0.0700	0.2939	
Mo	V	Co	Al	Ch	N	Pb	Sn	Ta	Ti
0.0110	0.0050			0.0100					0.0050

**Additional Chemical Properties**

					Cr + Cu + Ni
					0.3700

**Mechanical Properties**

Tensile (PSI)	Yield (PSI)	Elong. % in 2 in. or 4D	R of A	HBW	HBW2
70,923	48,588	33.0%	0.0%	0	0

**Charpy Minimum Impact - ft/lbs**

Test 1	Test 2	Test 3	Average
N/A	N/A	N/A	N/A

\* Hydro test passed. at 2500 psi.

\* Bend test passed.

We hereby certify that these parts were manufactured, sampled, tested, and inspected in accordance with the product specifications stated and were found to meet the requirements.

We further certify that this material was inspected using independent inspectors conforming to the requirements of EN 10204 3.1. These products meet the requirements of the latest editions of NACE MR0175, NACE MR0103, and ISO 15156. No weld repair has been performed on these products. This material was not exposed to mercury or any other metal alloy that is liquid at ambient temperatures during processing or while in our possession.

Meets ASME SA 106 Grade B Requirements.



116182-D  
Dec 15/16  
JMCO



**CapProducts, Ltd.**  
25 Winnipeg St  
Vanastra, ON N0M 1L0

**Phoenix \* Capitol \* Camco**  
**CapProducts**

**Certified Mill Test Report**

Commanding a Higher Standard<sup>sm</sup>

Printed: 11/2/2016  
**Customer**  
DistributionNOW (DNOW)  
(formerly CE Franklin)  
ACCOUNTS PAYBALE  
PO BOX 4395 STATION C

Certified: 11/02/2016  
P.O. 25644745  
Tag

Heat No A2864  
Heat Code 84LR  
Phoenix Order # 1234652

Material ASTM A106-2011 / ASME SA106-2010 Edition

**Part Number**  
15111005

**Description**  
1 X 2-1/2" XHSM BLK NIPL TBE

**Chemical Properties**

C	Mn	P	S	Si	Cu	Ni	Cr	C Eq. Long	
0.1800	0.9100	0.0110	0.0050	0.2170	0.0040	0.0230	0.0250	0.3393	
Mo	V	Co	Al	Cb	N	Pb	Sn	Ta	Ti
0.0030	0.0010		0.0190	0.0000					0.0010

**Additional Chemical Properties**


Cr + Cu + Ni
0.0520

**Mechanical Properties**

Tensile (PSI)	Yield (PSI)	Elong. % in 2 in. or 4D	R of A	HBW	HBW2
76,349	59,643	32.6%	0.0%	144	0

**Charpy Minimum Impact - ft/lbs**

Test 1	Test 2	Test 3	Average	Test Temp.
N/A	N/A	N/A	N/A	N/A

\* Hydro test passed. at 2500 psi.

\* Bend test passed.

We hereby certify that these parts were manufactured, sampled, tested, and inspected in accordance with the product specifications stated and were found to meet the requirements.

We further certify that this material was inspected using independent inspectors conforming to the requirements of EN 10204 3.1. These products meet the requirements of the latest editions of NACE MR0175, NACE MR0103, and ISO 15156. No weld repair has been performed on these products. This material was not exposed to mercury or any other metal alloy that is liquid at ambient temperatures during processing or while in our possession.

Meets ASME SA 106 Grade B Requirements.



116182-D  
Dec 15/16  
JMS



**CapProducts, Ltd.**  
25 Winnipeg St  
Vanastra, ON N0M 1L0

**Phoenix \* Capitol \* Camco**  
**CapProducts**

**Certified Mill Test Report**

*Commanding a Higher Standard<sup>sm</sup>*

Printed: 10/28/2016  
**Customer**  
DistributionNOW (DNOW)  
(formerly CE Franklin)  
ACCOUNTS PAYBALE  
PO BOX 4395 STATION C

Certified: 10/26/2016  
P.O. 25651608  
**Tag**

Heat No A3062  
Heat Code 868N  
Phoenix Order # 1237849

Material ASTM A106-2014 / ASME SA106-2015 Edition

**Part Number**  
15111007

**Description**  
1 X 3-1/2" XHSML BLK NIPL TBE

**Chemical Properties**

C	Mn	P	S	Si	Cu	Ni	Cr	C Eq. Long	
0.1700	0.8400	0.0140	0.0050	0.2000	0.0060	0.0200	0.0290	0.3185	
Mo	V	Co	Al	Cb	N	Pb	Sn	Ta	Ti
0.0030	0.0020			0.0000					0.0020

**Additional Chemical Properties**


Cr + Cu + Ni
0.0550

**Mechanical Properties**

Tensile (PSI)	Yield (PSI)	Elong. % in 2 in. or 4D	R of A	HBW	HBW2
78,916	61,139	32.0%	0.0%	144	0

**Charpy Minimum Impact - ft/lbs**

Test 1	Test 2	Test 3	Average	Test Temp.
N/A	N/A	N/A	N/A	N/A

\* Hydro test passed. at 2500 psi.

We hereby certify that these parts were manufactured, sampled, tested, and inspected in accordance with the product specifications stated and were found to meet the requirements.

We further certify that this material was inspected using independent inspectors conforming to the requirements of EN 10204 3.1. These products meet the requirements of the latest editions of NACE MR0175, NACE MR0103, and ISO 15156. No weld repair has been performed on these products. This material was not exposed to mercury or any other metal alloy that is liquid at ambient temperatures during processing or while in our possession.

Meets ASME SA 106 Grade B Requirements.

**Comments:**

Flattening test passed.



16182-D  
Dec 15/16  
Jmer





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25 Winnipeg St  
Vanastra, ON N0M 1L0

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**CapProducts**

**Certified Mill Test Report**

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Printed: 11/28/2016  
Customer  
TS & M SUPPLY  
TS & M SUPPLY  
314 KENSINGTON AVE,  
ESTEVAN, SK S4A 2A2

Certified: 11/08/2016  
P.O. 25662750  
Tag

Heat No A4355  
Heat Code 86BC  
Phoenix Order # 1243489  
Material ASTM A106-2014 / ASME SA106-2015 Edition

Part Number 15111008 Description 1 X 4" XHSML BLK NIPL TBE

**Chemical Properties**

C	Mn	P	S	Si	Cu	Ni	Cr	C Eq. Long	
0.1490	1.2510	0.0170	0.0060	0.2900	0.0110	0.0070	0.0470	0.3691	
Mo	V	Co	Al	Cb	N	Pb	Sn	Ta	Ti
0.0030	0.0020		0.0250	0.0000					0.0020

**Additional Chemical Properties**

					Cr + Cu + Ni	
					0.0650	

**Mechanical Properties**

Tensile (PSI)	Yield (PSI)	Elong. % in 2 in. or 4D	R of A	HBW	HBW2
79,200	63,406	33.0%	0.0%	155	0

**Charpy Minimum Impact - ft/lbs**

Test 1	Test 2	Test 3	Average	Test Temp.
N/A	N/A	N/A	N/A	N/A

\* Hydro test passed. at 2500 psi.

We hereby certify that these parts were manufactured, sampled, tested, and inspected in accordance with the product specifications stated and were found to meet the requirements.

We further certify that this material was inspected using independent inspectors conforming to the requirements of EN 10204 3.1. These products meet the requirements of the latest editions of NACE MR0175, NACE MR0103, and ISO 15156. No weld repair has been performed on these products. This material was not exposed to mercury or any other metal alloy that is liquid at ambient temperatures during processing or while in our possession.

Meets ASME SA 106 Grade B Requirements.

**Comments:**

Flattening test passed.



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Dec 15/16  
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25 Winnipeg St  
Vanastra, ON N0M 1L0

**Phoenix \* Capitol \* Camco**  
**CapProducts**

**Certified Mill Test Report**

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Printed: 11/28/2016  
Customer  
TS & M SUPPLY  
TS & M SUPPLY  
314 KENSINGTON AVE.  
ESTEVAN, SK S4A 2A2

Certified: 09/12/2016  
P.O. 25662750  
Tag

Heat No A2878  
Heat Code 869F  
Phoenix Order # 1243489  
Material ASTM A106-2014 / ASME SA106-2015 Edition

Part Number  
15111010

Description  
1 X 5" XHSML BLK NIPL TBE

**Chemical Properties**

C	Mn	P	S	Si	Cu	Ni	Cr	C Eq. Long	
0.1600	0.8200	0.0120	0.0040	0.2250	0.0380	0.0370	0.0460	0.3127	
Mo	V	Co	Al	Cb	N	Pb	Sn	Ta	Ti
0.0060	0.0030			0.0000					0.0030

**Additional Chemical Properties**


Cr + Cu + Ni
0.1210

**Mechanical Properties**

Tensile (PSI)	Yield (PSI)	Elong. % in 2 in. or 4D	R of A	HBW	HBW2
74,605	59,588	34.0%	0.0%	144	0

**Charpy Minimum Impact - ft/lbs**

Test 1	Test 2	Test 3	Average	Test Temp.
N/A	N/A	N/A	N/A	N/A

\* Hydro test passed. at 2500 psi.

\* Bend test passed.

We hereby certify that these parts were manufactured, sampled, tested, and inspected in accordance with the product specifications stated and were found to meet the requirements.

We further certify that this material was inspected using independent inspectors conforming to the requirements of EN 10204 3.1. These products meet the requirements of the latest editions of NACE MR0175, NACE MR0103, and ISO 15156. No weld repair has been performed on these products. This material was not exposed to mercury or any other metal alloy that is liquid at ambient temperatures during processing or while in our possession.

Meets ASME SA 106 Grade B Requirements.



*16182-D  
Dec 15/16  
Juep*



**CapProducts, Ltd.**  
25 Winnipeg St  
Vanastra, ON N0M 1L0

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**CapProducts**

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**Certified Mill Test Report**

Printed: 11/28/2016  
Customer  
TS & M SUPPLY  
TS & M SUPPLY  
314 KENSINGTON AVE.  
ESTEVAN, SK S4A 2A2

Certified: 11/02/2016  
P.O. 25662750  
Tag

Heat No A2864  
Heat Code 84LR  
Phoenix Order # 1243489

Material ASTM A106-2011 / ASME SA106-2010 Edition

Part Number  
15111012

Description  
1 X 6" XHSML BLK NIPL TBE

**Chemical Properties**

C	Mn	P	S	Si	Cu	Ni	Cr	C Eq. Long	
0.1800	0.9100	0.0110	0.0050	0.2170	0.0040	0.0230	0.0250	0.3393	
Mo	V	Co	Al	Cb	N	Pb	Sn	Ta	Ti
0.0030	0.0010		0.0190	0.0000					0.0010

**Additional Chemical Properties**


Cr + Cu + Ni
0.0520

**Mechanical Properties**

Tensile (PSI)	Yield (PSI)	Elong. % in 2 in. or 4D	R of A	HBW	HBW2
76,349	59,643	32.6%	0.0%	144	0

**Charpy Minimum Impact - ft/lbs**

Test 1	Test 2	Test 3	Average	Test Temp.
N/A	N/A	N/A	N/A	N/A

\* Hydro test passed. at 2500 psi.

\* Bend test passed.

We hereby certify that these parts were manufactured, sampled, tested, and inspected in accordance with the product specifications stated and were found to meet the requirements.

We further certify that this material was inspected using independent inspectors conforming to the requirements of EN 10204 3.1. These products meet the requirements of the latest editions of NACE MR0175, NACE MR0103, and ISO 15156. No weld repair has been performed on these products. This material was not exposed to mercury or any other metal alloy that is liquid at ambient temperatures during processing or while in our possession.

Meets ASME SA 106 Grade B Requirements.



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Dec 15/16  
Juep



江苏海达管件集团有限公司  
JIANGSU HAIDA PIPE FITTINGS GROUP CO., LTD

ISO 9001:2008

ADD: GUANHUA (E) RD. JIANHU (JIANHU ECONOMIC DEVELOP ZONE) JIANGSU CHINA  
TEL: 86 (0515) 8625 5695 / 8625 2999 FAX: (0515) 8625 5661

MILL TEST & INSPECTION CERTIFICATE

acc. To EN 10204 / DIN 10204 / DIN 50049/3.1B \*\* NACE MR. 0175 Ed. 2009

CUSTOMER: ALBERTA PIPE FITTINGS LTD

INVOICE NO.: 140903527

DATE: 2014.9.20

CERT. NO.: MC1409160007

ORDER NO.: 2014-234

PAGE: 2/9

material specification.

A105-2005 NORMALIZED AT 834-927° C, COOL IN STILL AIR

ITEM	HEAT CODE	CHARG E NO.	DESCRIPTION	QTY	MECHANICAL TEST				Inpac t	HARDN ESS (HB)
					YS (Mpa)	TS (Mpa)	EL (%)	RA (%)		
					250	485	22	30		
14-09-03545	0333	29M27	NPT TEE 1/4" 3M A105N	600	289	524	26	32		187
14-09-03546	0333	29M27	NPT TEE 3/8" 3M A105N	90	289	524	26	32		134-158
14-09-03547	0333	29M27	90° NPT ELBOW 1/4" 3M A105N	260	289	524	26	32		134-158
14-09-03548	0333	29M27	90° NPT ELBOW 3/8" 3M A105N	90	289	524	26	32		134-158
14-09-03549	0333	29M27	90° NPT ELBOW 1/2" 3M A105N	250	289	524	26	32		134-158
14-09-03550	0333	29M27	90° NPT ELBOW 1" 3M A105N	300	289	524	26	32		134-158
14-09-03551	0333	29M27	NPT CROSS 1/4" 3M A105N	100	289	524	26	32		134-158
14-09-03552	0333	29M27	45 NPT ELBOW 1/4" 3M A105N	260	289	524	26	32		134-158
14-09-03553	0333	29M27	45 NPT ELBOW 3/8" 3M A105N	90	289	524	26	32		134-158
14-09-03554	0333	29M27	45 NPT ELBOW 1/2" 3M A105N	210	289	524	26	32		134-158
14-09-03555	0333	29M27	45 NPT ELBOW 3/4" 3M A105N	120	289	524	26	32		134-158
14-09-03556	4037	29M27	45 NPT ELBOW 1" 3M A105N	100	289	524	26	32		134-158
14-09-03557	4037	29M29	45 NPT ELBOW 1-1/4" 3M A105N	72	281	547	28	32		132-154
14-09-03558	4037	29M29	45 NPT ELBOW 1-1/2" 3M A105N	50	281	547	28	32		132-154
14-09-03559	3680	29M29	45 NPT ELBOW 2" 3M A105N	60	281	547	28	32		132-154
14-09-03562	0333	29M27	NPT UNION 1/4" 3M A105N	360	289	524	26	32		134-158
14-09-03565	0333	29M27	NPT UNION 3/8" 3M A105N	75	289	524	26	32		134-158
14-09-03566	0333	29M27	NPT UNION 3/4" 3M A105N	360	289	524	26	32		134-158

DIMENSION: MSS SP95-2006  
THREADS: ANSI/ASME B1.20.1  
VISUAL & DIMENSION: GOOD

ITEM	HEAT CODE	CHEMICAL COMPOSITION												
		C	Si	Mn	P	S	Cr	Ni	Mo	Ti	V	Cu	AL	CE
		0.35	0.35	1.05	0.035	0.04	0.3	0.4	0.12	-	0.08	0.4	-	-
14-09-03545	0333	0.22	0.24	0.72	0.02	0.004	0.04	0.03	0.02		0.003	0.02		
14-09-03546	0333	0.22	0.24	0.72	0.02	0.004	0.04	0.03	0.02		0.003	0.02		
14-09-03547	0333	0.22	0.24	0.72	0.02	0.004	0.04	0.03	0.02		0.003	0.02		
14-09-03548	0333	0.22	0.24	0.72	0.02	0.004	0.04	0.03	0.02		0.003	0.02		
14-09-03549	0333	0.22	0.24	0.72	0.02	0.004	0.04	0.03	0.02		0.003	0.02		
14-09-03550	0333	0.22	0.24	0.72	0.02	0.004	0.04	0.03	0.02		0.003	0.02		
14-09-03551	0333	0.22	0.24	0.72	0.02	0.004	0.04	0.03	0.02		0.003	0.02		
14-09-03552	0333	0.22	0.24	0.72	0.02	0.004	0.04	0.03	0.02		0.003	0.02		
14-09-03553	0333	0.22	0.24	0.72	0.02	0.004	0.04	0.03	0.02		0.003	0.02		
14-09-03554	0333	0.22	0.24	0.72	0.02	0.004	0.04	0.03	0.02		0.003	0.02		
14-09-03555	0333	0.22	0.24	0.72	0.02	0.004	0.04	0.03	0.02		0.003	0.02		
14-09-03556	4037	0.22	0.24	0.72	0.02	0.004	0.04	0.03	0.02		0.003	0.02		
14-09-03557	4037	0.21	0.26	0.88	0.014	0.004	0.04	0.02	0.02		0.002	0.01		
14-09-03558	4037	0.21	0.26	0.88	0.014	0.004	0.04	0.02	0.02		0.002	0.01		
14-09-03559	3680	0.21	0.26	0.88	0.014	0.004	0.04	0.02	0.02		0.002	0.01		
14-09-03562	0333	0.22	0.24	0.72	0.02	0.004	0.04	0.03	0.02		0.003	0.02		
14-09-03565	0333	0.22	0.24	0.72	0.02	0.004	0.04	0.03	0.02		0.003	0.02		
14-09-03566	0333	0.22	0.24	0.72	0.02	0.004	0.04	0.03	0.02		0.003	0.02		

\* STEEL MAKING PROCESS: ELECTRIC FURNACE  
  
\*Outlet MSS SP-97  
\*SML Swag Nipple MSS SP-95  
\*Unions MSS SP-83

WE CERTIFY THE ABOVE MENTIONED FITTINGS HAVE BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH THE SPECIFICATIONS SHOWN  
  
Q. C. MANAGER  
INSPECTOR

TOM  
Dec 15/16  
PUCP



G10247

**ORIGINAL**

**MILL TEST CERTIFICATE**

**DONGKUK STEEL**

CH JA 3447 STAR ATLANTIC

Order No. : 3003575721  
 PO No. : LSC201406011  
 Commodity : CHANNEL  
 Specification : ASTM A572-50/CSA 300W/350W  
 Supplier : DONGKUK INTERNATIONAL, INC.  
 Customer : SALZGITTER  
 Certificate No. : PS5-2-140730-041-001  
 Date of issue : Jul. 30, 2014

Dimension	Product No	Quantity 6/D PCS	Weight kg	Heat No	Position	Tensile Test			Division	Chemical Composition(%)										Remarks			
						GL	YP	TS		EL	C	Si	Mn	P	S	Cr	Ni	Cu	Mo		Nb	V	
							N/mm <sup>2</sup>	%		%													
C 6 x 8.2 201t Specimen No:PS05294703-a	P736750-038.039.040.041.042	5 150	2.232	P73675	T	1	413	545	23	L	0.16	0.25	1.33	0.031	0.011	0.1	0.091	0.277	0.013	0.001	0.024		
	Sub Total (10)	5 150	11.160																				
	Size Total	150	11.160																				
C 8 x 11.5 201t Specimen No:PS05292502-a	P736680-039.049.050.051.052	5 100	2.080	P73668	T	1	409	557	24	L	0.14	0.23	1.29	0.023	0.009	0.091	0.116	0.199	0.02	0.001	0.023		
	Sub Total (30)	5 100	10.400																				
	Size Total	100	10.400																				
C 10 x 15.3 201t Specimen No:PS05337002-a	P744470-037.038.049.050.051	5 80	2.224	P74447	T	1	402	543	25	L	0.14	0.24	1.25	0.015	0.005	0.082	0.091	0.216	0.014		0	0.02	
	Sub Total (50)	5 80	11.120																				
	Size Total	80	11.120																				

\* Tensile Test Direction-Longitudinal  
 \* Supply Condition - As Rolled

We hereby certify that the material has been made and satisfactorily tested in accordance with above specification requirement called for by the above order. If the amount of Cr, Ni, Cu, Mo, Ti or Si is blank, the heat analysis for that element is less than 0.02% and/or of Nb, V is blank, it is less than 0.008%. \* Inspection documents : According to EN 10204 Type 3.1.

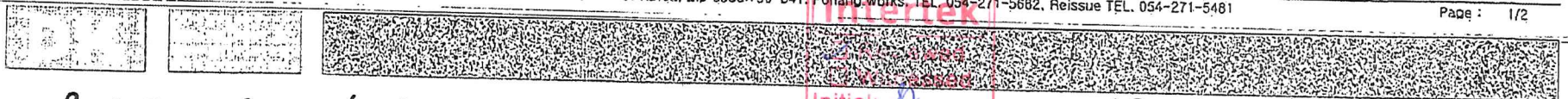
\* Specimen No. : a-Tension  
 \* Position : T-Top, M-Middle, B-Bottom  
 \* Division : L-Ladle Analysis, P-Product Analysis  
 \* Sub(Sub Size, Real Value, mm) : Blank-Full Size, 1-7.5\*10, 2-5.0\*10  
 \* GL(Gauge Length, mm) : 1-200, 2-100, 3-80, 4-70, 5-50, 6-5.65\*4, 7-5d, 8-4d, 9-8d  
 \* T(S), Al : Total(Soluble) Al \*Tr : Trace  
 \* NRL Result : G-No Break, B-Break  
 \* TTP(Through Thickness Position) : 1-Surface, 2-1/4T, 3-1/2T

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

원본인증 방법 : 동국제강 홈페이지 접속 (www.dongkuk.co.kr) → e비즈니스 클릭(홈페이지 하단) → 검사증명서 원본인증 클릭 → 정보인력후 검색

Surveyor to \_\_\_\_\_ Surveyor to \_\_\_\_\_ Surveyor to \_\_\_\_\_ Surveyor to \_\_\_\_\_  
 195, Cheolgangsandan-ro / 33, Songdeok-ro Daesong-myeon, Nam-gu, Pohang-si, Republic of Korea, Zip code:790-841, Pohang works, TEL. 054-271-5682, Reissue TEL. 054-271-5481

*[Signature]*  
 Chief of Quality Control Team



Roll 1573 Roll 1574 Roll 1575 Roll 1584

Initial: *[Signature]*  
 Date: 01/09/17  
 CA-0077

16182-P  
 NOV 21/16  
*[Signature]*



ESSAR STEEL ALGOMA INC., 105 West Street, Sault Ste. Marie, Ontario, Canada P6A 7B4



SO No., Item & Date.: 8035532 000010 2015/08/20	Shipment No. & Date.: 1000165381 2015/08/24	TC No., Date & Time : ESA-262485 2015/08/25 - 13:32:53											
Sold to Customer Name and Address : ALBERTA INDUSTRIAL METALS, 78TH STREET 4821 RED DEER, Alberta, Canada T4P 1N5	Ship to Customer Name and Address: ALBERTA INDUSTRIAL METALS, 78TH STREET 4821 RED DEER, Alberta, Canada T4P 1N5	Customer PO NO./Item: M63027821 / 1 BOL NO.: 1000165381 Cust.Part No.: 69296 Carrier : CN (CAD FUNDS) - gtw 187870											
Customer Specification : HR FLOOR PLATE Floor Plate Carbon CQ / CS ALGOMA 50/ASTM A786 (2013) / (09) Mark Number 69296 Top Standard Surface Standard Shape Gauge type MIN - 0/+ 0.0300 "													
Supplementary Instructions : Test Cert 1: aperry@russelmetals.com		Cust Use : FLOOR PLATE											
Insp T/R : Chemical Analysis													
ESSAR STEEL ALGOMA 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. THIS MILL TEST REPORT MAY NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF ESSAR STEEL ALGOMA INC. IF YOU RECEIVE THIS DOCUMENT AND ARE NOT THE INTENDED RECEIVER, PLEASE CALL (705)945-4095 FOR INSTRUCTIONS ON METHOD OF DISPOSAL OF DOCUMENT. THIS TEST REPORT HAS BEEN GENERATED BY A COMPUTERIZED SYSTEM AND IS VALID WITHOUT A PHYSICAL SIGNATURE.													
MEETS EN 10204 3.1 ISO QUALITY AND ENVIRONMENTAL CERTIFICATES AVAILABLE AT WWW.ESSARSTEELALGOMA.COM													
ALL HEATS FULLY KILLED. HEATS INDICATED WITH (*) FINE GRAINED. HEATS INDICATED WITH (+) Made in Canada for NAFTA duty preference and NAFTA marking purposes													
Dimensions (T x W x L)	Batch No.	Heat No-MS	Quantity	Pcs									
0.1730 " x 60.000 "	HBA5531	1484B3-03	37,434 LB	1									
*****CHEMICAL PROPERTIES*****													
Heat No. (wt%)	C	Mn	P	S	Si	Cr	Ni	Cu	Mo	Al	Nb	V	Ti
1484B3*	0.04	0.26	0.009	0.005	0.020	0.02	0.01	0.04	0.00	0.038	0.000	0.000	0.001

16182-P  
Nov 24/16  
SAC



KASHIF REHMAN  
MANAGER METALLURGICAL SERVICES

**\*\*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 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.



ESSAR STEEL ALGOMA INC., 105 West Street, Sault Ste. Marie, Ontario, Canada P6A 7B4



SO No., Item & Date.: 8040304 000010 2016/02/06	Shipment No. & Date.: 1200005014 2016/02/06	TC No., Date & Time : ESA-298677 2016/02/06 - 15:50:36
Sold to Customer Name and Address : ALBERTA INDUSTRIAL METALS, 78TH STREET 4821 RED DEER, Alberta, Canada T4P 1N5	Ship to Customer Name and Address: ALBERTA INDUSTRIAL METALS, 78TH STREET 4821 RED DEER, Alberta, Canada T4P 1N5	Customer PO NO./Item: M63028881 / 1 BOL NO.: 1200005014 Cust. Part No.: 69296 Carrier : CN (CAD FUNDS) - gtw 187804

Customer Specification : HR FLOOR PLATE Floor Plate Carbon CQ / CS ALGOMA 50/ASTM A786 (2013) / (09) Top Standard Surface Standard Shape Gauge type MIN - 0/+ 0.0300 "

Supplementary Instructions : Test Cert 1: aperry@russelmetals.com Cust Use : FLOOR PLATE

Insp T/R : Chemical Analysis

ESSAR STEEL ALGOMA 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. THIS MILL TEST REPORT MAY NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF ESSAR STEEL ALGOMA INC. IF YOU RECEIVE THIS DOCUMENT AND ARE NOT THE INTENDED RECEIVER, PLEASE CALL (705)945-4095 FOR INSTRUCTIONS ON METHOD OF DISPOSAL OF DOCUMENT. THIS TEST REPORT HAS BEEN GENERATED BY A COMPUTERIZED SYSTEM AND IS VALID WITHOUT A PHYSICAL SIGNATURE.

MEETS EN 10204 3.1  
ISO QUALITY AND ENVIRONMENTAL CERTIFICATES AVAILABLE AT WWW.ESSARSTEELALGOMA.COM

ALL HEATS FULLY KILLED.  
HEATS INDICATED WITH (\*) FINE GRAINED.  
HEATS INDICATED WITH (+) Made in Canada for NAFTA duty preference and NAFTA marking purposes

Dimensions (T x W x L)	Batch No.	Heat No-MS	Quantity	No. of Pcs	Dimensions (T x W x L)	Batch No.	Heat No-MS	Quantity	No. of Pcs
0.1730 " x 60.000 "	HBE2803	6070B4-53	39,286 LB	1	0.1730 " x 60.000 "	HBE2802	6070B4-03	39,815 LB	1
0.1730 " x 60.000 "	HBE2801	6070B4-52	39,308 LB	1					

.....CHEMICAL PROPERTIES.....

Heat No. (wt%)	C	Mn	P	S	Si	Cr	Ni	Cu	Mo	Al	Nb	V	Ti
6070B4*	0.06	0.37	0.011	0.006	0.020	0.04	0.02	0.03	0.00	0.031	0.000	0.000	0.001

16182 -D  
NOV 21/16  
JUCO



KASHIF REHMAN  
MANAGER METALLURGICAL SERVICES

**\*\*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 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.

Item 19, 22, 23



REPORT OF CHEMICAL/PHYSICAL TESTS

S O L D	MILKINSON STEEL & METALS INC (ECON) 9525 60TH AVE EDMONTON, T6E 0C3 CANADA	MILKINSON STEEL & METALS DIV PRESENT 5125 - 51 STREET SE CALGARY, AB T2C 3V2 CA	CONTINUUM NO. DATE PAGE 305888 Nov 26, 2013 1
			WILL. ORDER NO. DATE 54340
			CUSTOMER ORDER NO. P31104RT002C
			ISSUED NO.
			SHIPPING NO. DATE 305888 11/20/2013

THIS MATERIAL HAS BEEN MANUFACTURED, TESTED AND FOUND TO MEET THE SPECIFICATIONS AND PURCHASE ORDER REQUIREMENTS  
CST EKN STRUCTURAL TUBING CSA G40.21-04 GRADE 350W.

LABORATORY BURLINGTON NORTHERN
CAN/TRACE NO. NO

PHYSICAL PROPERTIES

HEAT NO.	DESCRIPTION	HEAT NO.	SLAB	YIELD PSI X 100	TENSILE PSI X 100	% ELONG F	% RA	HARDNESS BHN	WELD TEST	IMPACTS
4	3.000 X 3.000 X 0.1875 X 40' 20 PCS 5500 LBS	W00350		665	750	30				
7	3.000 X 3.000 X 0.2500 X 24' 30 PCS 6330 LBS	W00594		715	840	29				
8	3.000 X 3.000 X 0.2500 X 40' 12 PCS 4224 LBS	W00581		745	880	30				
	3 PCS 1056 LBS	W00596		730	855	29				

CHEMICAL ANALYSIS

HEAT NO.	C	Mn	P	S	Si	Cu	NI	V	Co	Al	Cr	Mo	Ti	N	Ca	CE	REMARKS
* W00350	.14	.86	.013	.005	.25	.02	.05	.007	.005	.041	.02	.00					
* W00594	.17	.89	.012	.004	.27	.01	.05	.004	.020	.043	.02	.00					
* W00581	.17	.88	.012	.003	.27	.01	.05	.005	.022	.031	.03	.00					
* W00596	.17	.85	.011	.004	.25	.01	.06	.003	.020	.043	.02	.00					

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

I certify the above to be correct as contained in the records of EVRAZ INC. NA By \_\_\_\_\_

16182-D  
Nov 21/16  
Lucio





74358



Acier Fati Steel, Inc.  
1445 Boul. Lionel-Boulet  
Varenes, J3X 1P7  
Québec, CANADA  
Phone: 450-929-1812  
Fax: 450-929-1798  
www.fatisteel.com

### MILL TEST REPORT

**Sold**

To: PRICE STEEL LTD.  
Crystal Swartz  
13500-156 St.  
Edmonton, AB  
T5V 1L3  
Canada

**Ship**

To: PRICE STEEL LTD.  
Crystal Swartz  
13500-156 St.  
Edmonton, AB  
T5V 1L3  
Canada

Bill of Lading No. BL16-02500  
Document Date 5/9/2016

Your Purchase Order No. 36536F  
Our Sales Order No. SO16-00610

<b>Description</b>		2.000 x 1.000 x 288.000 x 0.100 HR A500 B/C									
<b>Heat Number</b>		769900				<b>Made In</b>		Canada			
<b>C</b>	<b>Mn</b>	<b>P</b>	<b>S</b>	<b>Si</b>	<b>Al</b>	<b>Cu</b>	<b>Cb</b>	<b>Mo</b>	<b>Ni</b>	<b>Cr</b>	<b>V</b>
0.200	0.730	0.005	0.012	0.030	0.035	0.040	0.001	0.006	0.030	0.040	0.002
<b>Yield (Psi)</b>		<b>Tensile (Psi)</b>		<b>ELN.2IN (%)</b>		<b>Certification</b>					
57,700		68,000.00		28		ASTM A500 B/C					

<b>Description</b>		2.000 x 1.000 x 288.000 x 0.125 HR A500 B/C									
<b>Heat Number</b>		779941				<b>Made In</b>		Canada			
<b>C</b>	<b>Mn</b>	<b>P</b>	<b>S</b>	<b>Si</b>	<b>Al</b>	<b>Cu</b>	<b>Cb</b>	<b>Mo</b>	<b>Ni</b>	<b>Cr</b>	<b>V</b>
0.170	0.800	0.011	0.007	0.016	0.048	0.033	0.002	0.004	0.018	0.037	0.002
<b>Yield (Psi)</b>		<b>Tensile (Psi)</b>		<b>ELN.2IN (%)</b>		<b>Certification</b>					
57,400		65,000.00		26		ASTM A500 B/C					

<b>Description</b>		2.000 x 1.000 x 288.000 x 0.125 HR A500 B/C									
<b>Heat Number</b>		811884				<b>Made In</b>		Canada			
<b>C</b>	<b>Mn</b>	<b>P</b>	<b>S</b>	<b>Si</b>	<b>Al</b>	<b>Cu</b>	<b>Cb</b>	<b>Mo</b>	<b>Ni</b>	<b>Cr</b>	<b>V</b>
0.170	0.640	0.008	0.008	0.010	0.028	0.050	0.000	0.000	0.020	0.030	0.000
<b>Yield (Psi)</b>		<b>Tensile (Psi)</b>		<b>ELN.2IN (%)</b>		<b>Certification</b>					
55,000		66,800.00		25		ASTM A500 B/C					

16182-P  
NOV 21/16  
RUCP

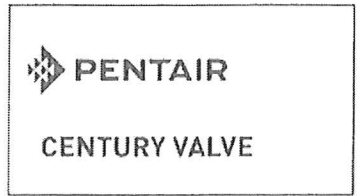


The results reported on this document represent the actual attributes of the material furnished and indicate the full compliance with all applicable specifications and contracts requirements.



the pressure equipment safety authority

STATUTORY DECLARATION  
Registration of Fittings



I, Partha Chinnasamy,

Engineering Manager

(company title, e.g. vice president, plant manager, chief engineer) (must be in a position of authority)

of Pentair Valves & Controls US L.P. - Harlingen (PV&C- Harlingen)

(name of manufacturer)

located at 5801 East Harrison, Harlingen, TX, USA 78550

(plant address)

do solemnly declare that the fittings listed hereunder, which are subject to the Safety Codes Act (check one)

comply with the requirements of MSS-SP-99 &/or ASME B16.34 which specifies the dimensions, (title of recognized North American Standard)

materials of construction, pressure/temperature ratings and identification marking of the fittings, or

are not covered by the provisions of a recognized North American standard and are therefore manufactured to comply with \_\_\_\_\_ as supported by the attached data which identifies the dimensions, materials of construction, pressure/temperature ratings and the basis for such ratings, and the marking of the fittings for identification.

I further declare that the manufacture of these fittings is controlled by a quality control program which has been verified by the following authority, Lloyd's Register Quality Assur as being suitable for the manufacture of these fittings to the stated standard. The fittings covered by this declaration, for which I seek registration, are \*See Attachment C.

In support of this application, the following information, calculations and/or test data are attached:

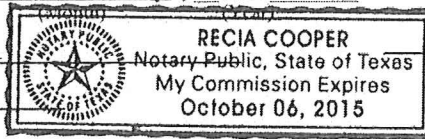
Century Valve Instrumentation Products Summary -Existing CRN OC08302.2- (Attachment C), recognized applicable codes and standards listing for all products, general catalogue data

DECLARED before me at Ft Bend County, TX in the presence of Partha Chinnasamy

this 26th day of November, 2014

(print) Recia Cooper

(sign) Recia Cooper  
(A Commissioner for Oaths)



[Signature]  
(Signature of Applicant)

For Office Use Only

To the best of my knowledge and belief, the application meets the requirements of the Safety Codes Act and CSA Standard B51, Clause 4.2, and is accepted for registration in Category e

Registration Number: OC08302.2

Date Registered: FEB 27 2015

[Signature]  
(For the Administrator/Chief Inspector of Alberta)  
Expiry Date: 2015.02.21

A. B

# Tyco Valves & Controls

5801 East Harrison  
Harlingen, TX 78550  
Telephone: 956-430-2500  
Fax: 956-430-2501

August 28, 2007

Albert Boiler Safety Association  
9410 – 20<sup>th</sup> Avenue  
Edmonton, Alberta, Canada T6N0A4  
Attn: Shelley Simon

RE: CRN # OC0368.92  
RUSH Request for Renewal – September 26<sup>th</sup>, 2007  
Renewal of CRN# OC0368.92 – Anderson Greenwood Instrumentation Valves  
Renewal of CRN#OC0368.92 – Century Valves (Previous ABSA CRN# OC0525.2 & 0H2164.2 – changed due to factory move from Calgary to Harlingen, Texas in 2004)

Dear Ms Simon:

Tyco Flow Control has ownership of two well established brands that have been sold into the Canadian market place for over 40 years. These instrumentation valves have been manufactured in Harlingen, Texas since 1984 and have been ISO certified since June of 1992. We also manufacture valves in another company owned facility in Manchester, United Kingdom, which has been ISO certified since 1990.

We have listed the two product brands below and the duplicate manufacturing facilities that both combine to build different varieties of these products as well as a brief description of the products in question. Our brands are Anderson Greenwood Instrumentation (AGI) and Century Valve; we understand that both expire on September 26<sup>th</sup>, 2007. There is some confusion on the Century validity date and some of these products would be most appreciated.

We previously have had a single CRN# to cover an entire product line as it is not practical to cover the many various styles and obvious confusion for inspectors and end-users. We have a common thread of bonnet designs and general arrangements throughout our offerings. All our valves are less than 1" in size in for all Instrument Valves and less than 2" in size for our Primary Isolation Valves. I have posted links to both our products web-sites below. We hope to maintain the "Single" CRN# for all products listed in our catalogues and manufactured at either facility if possible.

Neither of these brands or any of the products manufactured by either facility is specifically governed by any government agency or industry group of any kind. There is no specific product testing beyond individual internal test plans, quality programs, and following general API, ANSI, ASTM guidelines generally found in the industry. Although both product lines follow a manufacturing standard that is voluntary in regards to Instrument Valves (MSS-SP-99), many of our competitors do not follow these standards and no one oversees these as a third party in North America whatsoever. This manufacturing standard is included in our submission.

We hope to submit for our Alberta CRN registration ASAP, and then pursue the rest of Canada through ABSA. Please note any expediting/RUSH fees as it is VERY important for us to complete this in a timely manner.

OC08302.2  
OC08302.2

1 of 2

We have enclosed what we believe is required to complete the renewal of both product lines and we need confirmation that this is sufficient or a determination of what else we may need to consider. I have referenced our current CRN#s as well as our previous Century Valve CRN#, which I believe was originally registered directly in Alberta with ABSA.

#### CRN Classification – Fittings (Line Valves)

Manufacturing Facilities Locations (2):  
Tyco Flow Control  
Harlingen, Texas, USA

Tyco Flow Control – Safety Systems  
Manchester, UK

Product Brands (2):  
Anderson Greenwood Instrumentation Valves (AGI) - currently CRN#OC0368.92  
Types: Hand Valves, Gauge Valves, Manifold Valves, Primary Isolation Valves  
[www.aginstrumentation.com](http://www.aginstrumentation.com)

Century Valve - currently CRN#OC0368.92 (Previous ABSA CRN# OC0525.2 & 0H2164.2 – changed due to factory move from Calgary to Harlingen, Texas)  
Types: Hand Valves, Gauge Valves, Manifold Valves, Primary Isolation Valves  
[www.centuryvalve.com](http://www.centuryvalve.com)

Manufacturing Guidelines Followed for both Product Brands:  
Type: Hand Valves, Gauge Valves, Manifold Valves  
- MSS-SP-99 Instrument Valve Manufacturing/Testing (Voluntary)  
(Includes all ANSI / MSS material specifications and guidelines)

Type: Primary Isolation Valves (Instrument Root Valves)  
- ANSI/ASME B16.34 – Wall Thickness  
- ANSI/ASME B16.5 – Flange Dimensions  
- ANSI/ASME 8 – Design Procedures and Materials  
- ANSI/ASME B1.20.1 – National Pipe Thread  
- API 607 / BS6755 – Fire Tested

#### Submittals for Renewal

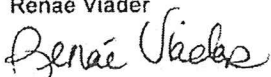
General Submittals for CRN registration:  
- Design Registration Application (7 copies) – ABSA Form AB-31  
- Statutory Declarations (14 Copies per manufacturing facility – Total 28) – ABSA Form AB-41  
- Certificate of Quality Program Registration (7 Copies per facility – 14 total) (ISO-9001)

Technical Submittals for CRN registration (2 copies of each for each jurisdiction = 14 total copies):  
- Catalogue Data for all products. (Pressure/Temp Ratings, Sizes/Styles, Model Numbers)  
- Dimensional Drawings (Included in Catalogue Data)  
- Internal Product Test Plans (Air Test / Hydrotest Procedures)  
- MS-SP-99 Instrument Valve Manufacturing Guideline

For any questions or further information, please contact Renae Viader, at (956) 430-2544 or email me at [rviader@tycovalves.com](mailto:rviader@tycovalves.com).

Best Regards,

Renae Viader



QA and Safety Manager  
Tyco Valves and Controls

OC08302.2

OC08302.2

#10



Cash A. Nashery  
Manager of Product  
Engineering -  
Instrumentation  
Products

Tyco Valves & Controls  
3950 Greenbriar  
Stafford, Texas, 77477

Tele: 281-274-4542  
Fax: 281-274-4532

e-mail: [cnashery@tycovalves.com](mailto:cnashery@tycovalves.com)

ATTACHMENT FOR  
CRN # 0C08302.26

Date: September 26, 2007

Re: Additional Information Required to Facilitate Assignment of Canadian Registry Numbers for Tyco Anderson Greenwood and Century Valve Instrumentation Valve and Manifold Products

The purpose of this correspondence is to present additional information to support our solicitation for Canadian Registry Numbers for Anderson Greenwood and Century Valve manufactured Instrumentation Valve and Manifold Products.

**Clarification of Materials of Construction as Referenced by Product Catalogs and Sales History**

Please note that all material for valve bodies are heat traceable and all pressure material are supplied with chemical and mechanical certified test reports per EN 10204 Type 3.1, additionally other grades within the referenced standards should also be considered for the purposes of this application.

Common pressure component materials and their applicable material specification:

**Carbon Steels**

- ASTM A105 - standard and normalized grades
- ASTM A216 - grade WCB / UNS J03002
- ASTM A560 - grade LF2, LF3, LF6 Grade 2
- ASTM A162 - F5, F9, F11, F12, F22, F91, F321 and other grades covered by this specification
- ASTM A108 - grades 1018, 1020, 1045
- ASTM A576 - grade 12L14 (non-code), 10L18 (non-code)
- B.S.970 070M20
- B.S.970 220M07/230M07

0C08302.26

**Stainless Steels**

- ASTM A479 - 316/316L, 316H, 317, 410 Cond. 2, 413, and all other grades covered by this specification
- ASTM A351 - specific grades of CF3, CF3M, CF8M, CK3MCuN, and other grades covered by this specification
- ASTM A276 - 316/316L, 304
- ASTM A560 - 630 (17-4pH)
- ASTM A564 - Grade 630 / UNS 17400 (17-4PH)
- ASTM A581 - 303
- ASTM A582 - 303 / UNS30300
- ASTM A182 - F51, F55, F44, F316, F316L, F321, F347 and other grades covered by this specification
- Duplex 2205 / UNS S31803 - ASTM 479
- Zeron® 100 Super Duplex / UNS S32760 - ASTM 479
- 6MO UNS S31254 - ASTM 479
- ASTM A890 - Grades 4A & 5A and other grades as covered by this specification

0C08302.26

High Nickel / Nickel-Chrome alloys

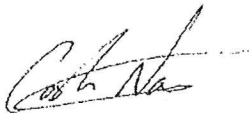
- Monel® R400: ASTM B164 / UNS N04400
- Monel® R405: ASTM B164 / UNS N00405
- Monel® K500: ASTM B865
- Hastelloy® C276: ASTM B574 / UNS N10276
- ASTM A494 – grade CW-12MW / UNS N30002
- Inconel® 600: ASTM B166 / UNS N06600
- Inconel® 625: ASTM B446 / UNS N06625
- Inconel® 718: ASTM B637 / UNS N07718
- Inconel® 800: ASTM B408 / UNS N08800
- Inconel® 825: ASTM B425 / UNS N08825
- Inconel® 725: ASTM B805 / UNS N07725
- Alloy 20: ASTM B473 / UNS N08020
- Alloy C276: ASTM A494 – GRADE CW-2M
- Alloy X750 / UNS N07750: ASTM B637
- Alloy 400: ASTM A494 – GRADE M-35-1
- Alloy 625: ASTM A494 – GRADE CW-6MC
- Alloy 825 / UNS N28820: ASTM A494 – GRADE CU5MCuC
- Alloy 925: UNS N09925: ASTM B637
- Alloy 4130: ASTM A418
- Alloy C22: ASTM B564 / UNS N06022
- ASTM B574 / UNS N06022
- ASTM B564 / grades UNS N04400, N10276, N06625, N08825 and all other grades covered by this specification
- ASTM B423 / UNS N08825

Other materials

- ASTM B348 (Grade 2 Titanium)
- ASTM B146 (Grade 2 Brass, non-code)
- B.S. 2874 (Aluminium Bronze)
- B.S. 2874 – CZ121 (Brass)

Please do not hesitate forwarding any questions or requirements for further technical information.

Respectfully submitted,



Cash Nashery  
Tyco Valve and Controls  
ANDERSON GREENWOOD

0 C U 8 3 0 2 . 2



Customer Name

Customer PO#

Shipper No

Heat Number

175 19

Pentair Flow Control AG - Harlingen 4500145736

5040

260987



# VALBRUNA

SLATER STAINLESS, INC.

2600 TAYLOR STREET WEST - PO BOX 630  
FORT WAYNE IN 46802 USA  
PHONE 260.434.2800 FAX 260.434.2801

## Product Certification Report

Report Number: **5040480**

Certified on Aug 22, 2014 Page 1 of 2

Order I.D. <b>1402148 002</b>		Order Date <b>8/11/14</b>		Commodity Code <b>316S01.25</b>			
Dim 1 <b>1.2500</b>	Dim 2 <b>.0000</b>	Dim 3 <b>.0000</b>	Heat I.D. <b>260987</b>	Customer I.D. <b>002471</b>	Customer Purchase Order <b>41451</b>		
Product Shape <b>Cold Drawn Squares</b>			Product Surface <b>Cold Drawn Finish</b>			Customer Grade <b>316/316L</b>	
Length (inches) <b>132.000 Min. 156.000 Max.</b>			Ball of Lading # <b>422761</b>	Weight			

Ship To

VALBRUNA STAINLESS, INC  
4747 OATES ROAD  
HOUSTON, TX 77013

Sold To

VALBRUNA STAINLESS, INC.  
4747 OATES ROAD  
HOUSTON, TX. 77013

Lift#: 0098

Condition A	QQ-S-763F	ASTMA 276-13a
ASTMA 314-13a	ASTMA 479-13b	ASMESA 182 13 Chem Only
ASMESA 479-13	AMS 5653H	AMS 5648L

SAE-AMS QQ-S-763C

### CHEMICAL ANALYSIS

C	Mn	P	S	Si	Cr	Ni	Mo	Cu	Co	N
.022	1.34	.030	.023	.39	16.71	10.05	2.02	.52	.17	.080

BRINELL (Type A device used)

HBW  
189

### TENSILE PROPERTIES ASTM E8-13a

TS (PSI)	.2%YS (PSI)	%EL(2")	%RA
88500	54500	53.6	76.6

### MACRO ASTM E340-13/E381-01

MACRO  
OK

### GRAIN SIZE ASTM E112-13

GRAIN SIZE	Etchant	Magnification X
5	Oxalic	100

### ASTM A262-13 PR E(A Utilized)

OXALIC	Etchant	Magnification X	QUENCH	SENS(F)	SENS(HR)
OK	Oxalic	500	Air	1200	1.50

No welding or weld repair done.

Material when shipped is free from contamination by mercury, radium, alpha source, and low melting elements.

Reduction Ratio Exceeds 4:1

Electric Furnace melted; AOD refined.

Chemical testing to one or more of the listed ASTM methods:

E415-14, E1019-11, E1086-14.

Location of tensile fracture; inside middle of gage length.

Chemical Analysis performed at Acciaierie Valbruna, Italy.

No mercury or low melting alloy contamination. No weld repair.

Material melted in Italy, manufactured in the United States.

Material conforms to listed specifications and is DFARS compliant.

Results relate only to the items tested. Certification shall not be reproduced except in full, without written approval of Valbruna Stainless Inc. The recording of false, fictitious, or fraudulent statements on this document may be punished as a felony under federal statutes. Including Federal law Title 18, Chapter 47. Consult material safety data sheet (MSDS) for hazard info. I hereby certify that the reported figures are correct as contained in the records of the corporation.

Manager Laboratory Services

*Dennis Hackett*

email: DHackett@valbruna.us

Dennis Hackett

RAWMtl # 11285841

HEAT # 260987 CODE H579

INSP J. Martinez DATE 10-30-15

Customer Name

Customer PO#

Shipper No

Heat Number

Pentair Flow Control AG - Harlingen 4500145736

5040

260987



**VALBRUNA**

SLATER STAINLESS, INC.  
2400 TAYLOR STREET WEST - PO BOX 630  
FORT WAYNE IN 46802 USA  
PHONE 260.454.2650 - FAX 260.414.2801

Product Certification Report

Report Number: **5040480**

Certified on Aug 22, 2014 Page 2 of 2

Order I.D. <b>1402148 002</b>		Order Date <b>8/11/14</b>		Commodity Code <b>316SQ1.25</b>	
Dim 1 <b>1.2500</b>	Dim 2 <b>.0000</b>	Dim 3 <b>.0000</b>	Heat I.D. <b>260987</b>	Customer I.D. <b>002471</b>	Customer Purchase Order <b>41451</b>
Product Shape <b>Cold Drawn Squares</b>			Product Surface <b>Cold Drawn Finish</b>		Customer Grade <b>316/316L</b>
Length (inches) <b>132.000 Min. 156.000 Max.</b>		BU of Loading # <b>422761</b>	Weight		

Ship To

VALBRUNA STAINLESS, INC  
4747 OATES ROAD  
HOUSTON, TX 77013

Sold To

VALBRUNA STAINLESS, INC.  
4747 OATES ROAD  
HOUSTON, TX. 77013

Quality system is compliant with ISO 9001:2008. Produced in accordance with EN 10204 3.1.

Results relate only to the items tested. Certification shall not be reproduced except in full, without written approval of Valbruna Stainless Inc. The recording of false, fictitious, or fraudulent statements on this document may be punished as a felony under federal statutes. Including Federal law Title 18, Chapter 47. Consult material safety data sheet (MSDS) for hazard info. I hereby certify that the reported figures are correct as contained in the records of the corporation.

Manager Laboratory Services

email: DHackett@valbruna.us

Dennis Hackett

RAW MTL # **11285841**

HEAT # **260987** CODE **H579**

INSP **J. Mustang** DATE **10-30-15**





# VALBRUNA

SLATER STAINLESS, INC.  
2400 TAYLOR STREET WEST - PO BOX 630  
FORT WAYNE IN 46802 USA  
PHONE 260.434.2800 - FAX 260.434.2801

## Product Certification Report

Report Number: 5091480

Certified on Dec 22, 2014 Page 1 of 2

Order I.D. 1402507 001		Order Date 9/29/14		Commodity Code 14072	
Dim 1 1.2500	Dim 2 .0000	Dim 3 .0000	Mat.I.D. 261932	Customer I.D. 001520	Customer Purchase Order 02037967
Product Shape Cold Drawn Squares			Product Surface Cold Drawn Finish		Customer Grade 316/316L
Length (Inches) 132.000 Min. 156.000 Max.			Bill of Lading # 423179	Weight	

**Ship To**  
TRIDENT COMPANY  
9501 BAYTHORNE RD  
HOUSTON, TX 77040-0026

**Sold To**  
VALBRUNA STAINLESS, INC.  
2400 TAYLOR STREET WEST  
FORT WAYNE, IN 46802

Lifts: 0026 0029 0031 0033 0036 0038 0040

Condition A	QQ-S-763F	ASTMA 276-13a
ASTMA 314-13a	ASTMA 479-14	ASMESA 182 13 Chem Only
ASMESA 479-13	AMS 5653H	AMS 5648L

SAE-AMS QQ-S-763C

### CHEMICAL ANALYSIS

C	Mn	P	S	Si	Cr	Ni	Mo	Cu	Co	N
.025	1.34	.031	.028	.36	16.77	10.08	2.08	.55	.17	.076

BRINELL (Type A device used)

HBW  
196

### TENSILE PROPERTIES ASTM E8-13a

TS (PSI)	2%YS (PSI)	%EL(2")	%RA
90500	60500	47.9	74.9

### MACRO ASTM E340-13/E381-01

MACRO  
OK

### GRAIN SIZE ASTM E112-13

GRAIN SIZE	Etchant	Magnification X
7	Oxalic	100

### ASTM A262-13 PR E(A Utilized)

OXALIC	Etchant	Magnification X	QUENCH	SENS (F)	SENS (HR)
OK	Oxalic	500	Air	1200	1.50

No welding or weld repair done.

Material when shipped is free from contamination by mercury, radium, alpha source, and low melting elements.

Reduction Ratio Exceeds 4:1

Electric Furnace melted; AOD refined.

Chemical testing to one or more of the listed ASTM methods:

E415-14, E1019-11, E1086-14.

Location of tensile fracture: inside middle of gage length.

Chemical Analysis performed at Acciaierie Valbruna, Italy.

No mercury or low melting alloy contamination. No weld repair.

Melted and manufactured in Italy.

Material conforms to listed specifications and is DFARS compliant.

RAW MTL # 7000004728

HEAT # 261932 CODE H432

INSP A. Martinez DATE 1-12-15

Results relate only to the items tested. Certification shall not be reproduced except in full, without written approval of Valbruna Stainless Inc. The recording of false, fictitious, or fraudulent statements on this document may be punished as a felony under federal statutes. Including Federal law Title 18, Chapter 47. Consult material safety data sheet (MSDS) for hazard info. I hereby certify that the reported figures are correct as contained in the records of the corporation.

Manager Laboratory Services

*Dennis Hackett*

email: DHackett@valbruna.us

Dennis Hackett



**VALBRUNA**  
 SLATER STAINLESS, INC.  
 2400 TAYLOR STREET WEST - PO BOX 630  
 FORT WAYNE IN 46802 USA  
 PHONE 260.434.2800 - FAX 260.434.2801

Product Certification Report

Report Number: 5091480

Certified on Dec 22, 2014 Page 2 of 2

Order LD. 1402507 001		Order Date 9/29/14		Commodity Code 14072			
Dim 1 1.2500	Dim 2 .0000	Dim 3 .0000	Heat I.D. 261932	Customer I.D. 001520	Customer Purchase Order 02037967		
Product Shape Cold Drawn Squares			Product Surface Cold Drawn Finish			Customer Grade 316/316L	
Length (inches) 132.000 Min. 156.000 Max.			Bill of Lading # 423179	Weight			

Ship  
To

TRIDENT COMPANY  
 9501 BAYTHORNE RD  
 HOUSTON, TX 77040-0026

Sold  
To

VALBRUNA STAINLESS, INC.  
 2400 TAYLOR STREET WEST  
 FORT WAYNE, IN 46802

Quality system is compliant with ISO 9001:2008. Produced in accordance with EN 10204 3.1.

RAW MTL # 7000004728  
 HEAT # 261932 CODE H432  
 INSP J. Mantione DATE 1-12-15

Results relate only to the items tested. Certification shall not be reproduced except in full, without written approval of Valbruna Stainless Inc. The recording of false, fictitious, or fraudulent statements on this document may be punished as a felony under federal statutes, including Federal law Title 18, Chapter 47. Consult material safety data sheet (MSDS) for hazard info. I hereby certify that the reported figures are correct as contained in the records of the corporation.

Manager Laboratory Services

*Dennis Hackett*

email: DHackett@valbruna.us

Dennis Hackett



# SECTION 6

Bay 2, 3809 53<sup>rd</sup> Avenue  
Lacombe, AB  
T4L 2L6  
403.304.8314

December 21, 2016

**Attention:** Natasha McDonald  
ENVISION MANUFACTURING & SUPPLY LTD  
PO BOX 5424  
3809 53 AVENUE BAY 2  
LACOMBE, AB T4L 1X1

**Email:** natasha@envisionmanufacturing.ca

The design submission, tracking number 2016-06544, originally received on December 13, 2016 was surveyed and accepted for registration as follows:

**Reg. No. :** PP-0328-G-050-P

**Accepted on:** December 21, 2016

**Reg Type:** Modification

**Drawing No. :** 16182 LINE LIST Rev 0 As Noted

Design registered in the name of : PARAMOUNT RESOURCES LTD

*This piping design submission has been registered based on the conditions that:*

- *The Professional Engineer who stamped the AB-96 form in accordance with Section 16(2) of the AR 49/2006 Pressure Equipment Safety Regulation (hereafter referred to as PESR), (i) has reviewed this design, (ii) is satisfied that it is in compliance with applicable regulations and codes, and (iii) has accepted responsibility for the design;*
- *The design of each pressure piping system complies fully with the requirements of ASME B31.3 and that the piping contractor has a valid Certificate of Authorization Permit, issued in accordance with the PESR for the scope of work;*
- *All valves, flanges and other fittings have been registered in Alberta by their manufacturers and have pressure/temperature ratings equal to or higher than the system's maximum allowable working pressure;*
- *All pressure equipment shall be properly protected by pressure relief valves set at or below the lowest maximum allowable working pressure of any equipment protected by that relief valve, except as declared on the submitted AB-96 form and/or appropriate supporting documentation listed in the table on the next page.*
- *Where ABSA is not properly informed on the AB-96 form and application design documents that pressure equipment is protected by RDD, PD, OPPSD or OMOPP according to Section 38(1)(b) of AR49/2006, it is understood that RDD, PD, OPPSD or OMOPP will not be used with this design and that all pressure equipment is properly protected by pressure relief valves set at or below the lowest maximum allowable working pressure of any equipment protected by that pressure relief valve.*

December 21, 2016

Type of Overpressure Protection	Document #	Rev.
Pressure Relief Valves (PRV), per Section 38(1)(a) of the PESR and Section 5.1 of AB-525	16182 LINE LIST	0

**The registration is conditional on your compliance with the following notes:**

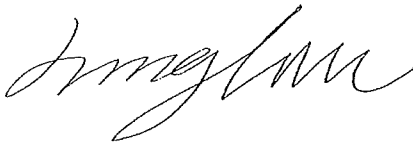
*This registration is based on applicable lines are protected by PSV and the flow path shall be unobstructed.*

Complete the enclosed AB-81 forms in triplicate, keep one copy and forward two copies to ABSA.

An invoice covering survey and registration fees will be forwarded from our Revenue Accounts.

Enclosed are stamped prints for your reference.

Sincerely,



LIU, XING, P. Eng.



# Design Registration Application

Please complete a separate form for each design/procedure you wish to register.

Date of Application (yyyy/mm/dd): 2016/12/12

**New Submission**

**Resubmission** Ref. Tracking No. \_\_\_\_\_

**Revision** Ref. CRN \_\_\_\_\_

**Repair or Alteration** Ref. CRN \_\_\_\_\_  
(incl. 2 copies of the AB-230) Ref. A No. \_\_\_\_\_

**Used Equipment Imported to Alberta\*\***

**For Registration in other Canadian provinces and territories\*\***

BC  SK  MB  ON  QC  NB  
 NS  PE  NL  NT  YT  NU

**For ABSA Office Use Only**

Tracking No. \_\_\_\_\_

Date Received DEC 13 2016

Assigned Surveyor \_\_\_\_\_

Response Date \_\_\_\_\_

**Quality Plan\*\*** (for recognized AQP holders only)

AQP No.: AQP-1584

RDR / RDS Name \_\_\_\_\_

For QP Initial Audit  Yes  No

**Manufacturer's Full Legal Company Name and Address**

(plant owner for piping) Paramount Resources Ltd.

Mailing Address: 4700 Bankers Hall West  
888 3rd Street SW, Calgary, AB  
T2P 5C5

Contact Person: Sandy Jeeves

Phone Number: 403.290.3638

Fax Number: 403.266.6032

Email Address: sandy.jeeves@paramountres.com

**Submitter's Full Legal Company Name and Address**

same as manufacturer  see below

EnVision Manufacturing & Supply Ltd.

Mailing Address: P.O Box 5424  
Lacombe, AB  
T4L 1X1

Contact Person: Natasha McDonald

Phone Number: 403.741.5301

Fax Number: N/A

Email Address: natasha@envisionmanufacturing.ca

**Invoicing Instructions**

The invoice will be sent and the documents will be returned to the Submitter.

P.O. No. or Ref. No.: 16182-A  
(if required for payment)

Call for submission pick-up

**Additional Information**

Include **two sets of drawings (folded)**, one set of calculations and the applicable Form AB-31a or AB-31b.

**Main Drawing No(s), Fitting Catalogue No., or Welding Spec No.:** \_\_\_\_\_

**Vessel or Boiler** ASME Sec.: \_\_\_\_\_  
Code of Construction (incl. Form AB-31a) Div.: \_\_\_\_\_

**Piping** (incl. 1 copy of the AB-31b and 2 copies of the AB-96\*)  
Ref. PP No.: \_\_\_\_\_

**Fitting** ( New /  Addition /  Renewal)  
(incl. 2 original copies of the AB-41\* and 2 copies of the AB-257)  
Ref. CRN (if applicable): \_\_\_\_\_

**Welding Procedure**

**Pneumatic Testing Procedure** (for piping)  
Ref. PP No.: \_\_\_\_\_

**Hot Tap Procedure** (for piping)  
Ref. PP No.: \_\_\_\_\_

**Reciprocal Design** (incl. proof of registration)  
Reciprocal CRN: \_\_\_\_\_

**Other** (specify) \_\_\_\_\_

**Type of Pressure Equipment** (check only one)

Boiler  Pressure Vessel  Heat Exchanger

**Rush Rate Authorized by:** \_\_\_\_\_  
**Date required:** \_\_\_\_\_

\* Required Forms

\*\* See the ABSA website for further information [www.absa.ca](http://www.absa.ca)

AP - 0328 - G - 050 - P

# Design Registration Application Supplemental Sheet

## Minimum Required Information for Pressure Piping System Submissions

Please select the appropriate check box.

		Yes Provided	No N/A
<b>A</b>	<b>AB-31 Design Registration Application Form</b>		
A.1	Complete form AB-31 (Page1)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>B</b>	<b>AB-96 Form</b>		
B.1	Check for completeness including P.Eng Stamp	<input checked="" type="checkbox"/>	<input type="checkbox"/>
B.2	Is the Ultimate Owner name and physical mailing address correct?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
B.3	Is the type of plant and location for the pressure piping system correct?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
B.4	Is the scheduled or tentative start and completion correct?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
B.5	Is the applicable code of construction and edition correct?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
B.6	Are the flanges, piping, valves, fittings, & etc... suitable for the application and are consistent with the Line Class?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
B.7	Is the overpressure protection documented and submitted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>C</b>	<b>Piping and Instrumentation Diagram</b>		
C.1	Do the applicable P&IDs have a P.Eng. Stamp?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
C.2	Are safeguards in place for over pressure protection?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
C.3	Are line numbers, classes and code breaks identified?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
C.4	Are pressure relief devices identified on the drawings?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>D</b>	<b>Piping Line Designation Table</b>		
D.1	Do the applicable Line Designation Tables have a P.Eng. Stamp?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
D.2	Are design conditions listed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
D.3	Are the listed Minimum Design Metal Temperatures (MDMTs) correct and within the scope of the material line class?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
D.4	Are material impact test requirements listed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
D.5	Are the Post Weld Heat Treat (PWHT) requirements listed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
D.6	Are the line classes suitable for the application?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
D.7	Are the test pressures listed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
D.8	Are the amount and type of Non-Destructive Examination clearly identified?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>E</b>	<b>Pressure Relief</b>		
E.1	Does the applicable Pressure Relief Valve (PRV), Rupture Disc Device RDD, or Pin Device (PD) list have a P.Eng. Stamp?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
E.2	Does the overpressure protection philosophy make use of PRVs?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
E.3	Does the overpressure protection philosophy make use of RDD or PD?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
E.4	Have the PRV set pressures been checked against the equipment design pressures?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
E.5	Does the overpressure protection philosophy make use of Overpressure Protection by System Design (OPPSD)? If NO, then proceed to Section F.		
E.5a	o Does the piping system comply with AB-525 section 5.3 or 5.4? (Answer NO if in compliance with section 5.5.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
E.5b	o Are the P&ID showing OPPSD submitted?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
E.5c	o Is the design basis for OPPSD submitted?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
E.5d	o Is the Overpressure Risk Assessment (ORA) summary P.Eng. Stamped and submitted?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
E.5e	o Are the details of the monitoring system submitted?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

# Design Registration Application Supplemental Sheet

F	Piping Material Class		
F.1	Is the material class suitable for the piping code of construction?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
F.2	Does the material class list all materials used for this piping system?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
F.3	Does the material class include limitations for temperature and pressure?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
G	Pressure Testing		
G.1	Are the pressure tests performed hydrostatically?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
G.2	Are the pressure tests performed pneumatically?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
G.2a	o If pneumatic testing is specified, are the test procedures submitted?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
G.2b	o Do the pneumatic test procedures specify the pressure, temperature, duration, and safety precautions?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
H	Closure Weld Require Registration		
H.1	Are the reasons submitted why pressure tests are impracticable?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
H.2	Are all closure welds identified?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
H.3	Has the closure weld procedure according to AB-519 been previously submitted?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
H.4	Has a Site Specific Closure Weld Procedure been submitted?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
I	Others		
I.1	Are there any other items not considered above that require the Safety Code Officer attention?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Main Drawing No(s). 16182 DUAL-25HP-INST AIR PID REV 1

By signing below, the submitter or piping system owner agrees that it is his/her responsibility to ensure that the above required information is provided in the submission. Failure to provide the minimum required information specified above may result in delay of review or refusing registration of the design.

Natasha McDonald  
Checked By:
Natasha McDonald  
Signature
Dec 12, 2016  
Date

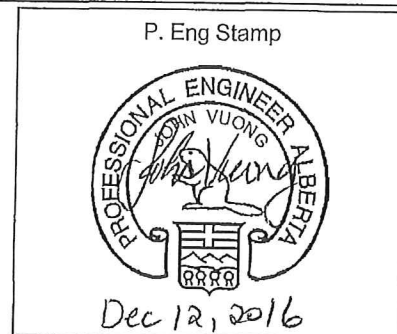
**Terminology and Acronyms**

- OPPSD – Overpressure Protection by System Design. Refer to AB-525 Overpressure Protection Requirements for Pressure Vessels and Pressure Piping for details.
- Overpressure Risk Assessment - This is a risk assessment to determine the sources of overpressure and the Maximum Upset Pressure. Refer to AB-525.
- P.Eng. – A Professional Engineer is a person who is registered as a professional engineer in a professional organization and authorized to practice engineering in any province or territory of Canada in any state of the United States of America



**NOTE:** This form shall be completed (page 1 and 2) in **DUPLICATE** and submitted with specifications and prints of designs in accordance with Section 16 (1) of the Pressure Equipment Safety Regulation.

1. Ultimate Owner Paramount Resources Ltd.  
4700 Bankers Hall West, 888 3<sup>rd</sup> Street SW, Calgary, Alberta, T2P 5C5  
(Name and Address)
2. Type of Plant Sour Gas Compressor Station
3. Location of Plant 06-18-066-04 W6M  
(Sec., TWP., Rge.)
4. Plant previously registered under PP - 0328-G-050-P
5. Construction: Tentative start and completion dates:  
Commencement December 2016 Completion January 2017  
(month) (year) (month) (year)
- 6(a) Engineered by Swift Engineering Inc. Ref. or Job No. 16182  
Suite 910, 736 - 8<sup>th</sup> Avenue SW, Calgary, Alberta, T2P 1H4  
(Company Name and Address)
- 6(b) Permit to Practice Number 08442
7. Prime Contractor EnVision Manufacturing & Supply Ltd. Ref. or Job No. 16182  
Bay 2, 3809 53<sup>rd</sup> Ave, Lacombe, Alberta, T4P 2L6  
(Company Name and Address)
8. Pressure Piping to comply with the Code: B31.1  B31.3  B31.5  B31.9  Z662  2014  
(Edition/Addenda)
9. List of documents with revision #'s (If additional space if required, use supplemental sheets) P&IDs, PSV and Line Lists, Specifications for pipe, valves & all fittings included in the scope of this piping design registration. If documents are listed on supplemental sheet, record the supplemental sheet numbers in this space.  
16182 PID Drawing# 16182 DUAL-25HP-INST AIR PID Rev 1  
16182 LINE LIST (16104-1501-01 PKG2231) Rev 0  
Line Class A Rev 4  
Line Class AL Rev 4
10. Name and authenticated stamp/seal of Professional Engineer  
By applying my stamp/seal and signature to this document,  
I, John Vuong, accept responsibility  
(print name)  
for the piping design in accordance with ASME B31.3 - 2014 and  
(Code/Edition/Addenda)  
the Safety Codes Act and Regulations.



**FOR ABSA USE ONLY:**

Reference Tracking No. 2016-06544

11. Are all fittings suitable for the specific design service conditions? (Yes) Yes \_\_\_\_\_

Are all fittings registered with ABSA? (Yes) Yes \_\_\_\_\_ (Pending) \_\_\_\_\_

12. Select the system overpressure protection type, as required in the PESR Section 38 and as defined in AB-525, and provide the corresponding document number(s) which lists equipment protected by this type.

Type	Document #	REV	Type	Document #	REV
PRV <input checked="" type="checkbox"/>	16182 LINE LIST (16104-1501-01 PKG2231)	0	V-OPPSD <input type="checkbox"/>		
RDD or PD <input type="checkbox"/>			P-OMOPP <input type="checkbox"/>		
P-OPPSD <input type="checkbox"/>			V-OMOPP <input type="checkbox"/>		

13. Nondestructive Examination. Please specify type and extent of examination, for example, 100% or random radiography, magnetic particle, ultrasonic, etc.

10% Random radiography (B31.3 NFS)

14. Pressure Piping Test Procedure for other than Hydro test SUBMITTED (Yes) N/A (Pending) N/A

15. Contractor's Quality Control Program Registration No. AQP-1584

16. General Remarks Weld Procedure Registration Number: WP-3603.2

17. Submitted by

*Natasha McDonald*  
(Signature)

December 12, 2016  
(Date)

Natasha McDonald  
(Name)

EnVision Manufacturing & Supply Ltd.  
(Company Name)

**FOR ABSA USE ONLY:**

Registration Number AP-0328--G--50-P Date 2016-12-21

Reference Tracking No. 2016-06544 S.C.O.'s Signature *[Signature]*

**K-2231-01/02**  
**AIR COMPRESSOR**  
 PART# ROTORCOMP RS25ENC  
 110 CM/HR @ 1310 kPa  
 MAVP: 1448 kPa  
 MADP: 1310 kPa  
 c/w 25HP MOTOR 3600RPM

**V-2231-03**  
**WET AIR RECEIVER**  
 PART# VERTICAL  
 MAVP: 2068 kPa @ 204°C  
 HDMT: -20°F @ 2068 kPa  
 120 GAL., 24" Ø x 67" LG.

**V-2231-07**  
**DRY AIR RECEIVER**  
 PART# VERTICAL  
 MAVP: 2068 kPa @ 204°C  
 HDMT: -29°C @ 1379 kPa  
 240 GAL., 30" Ø x 84" LG.

**D-2231-04**  
**HEATLESS AIR DRYER**  
 PART#  
 119 CM/HR @ 1310 kPa  
 120V/1PH/60Hz  
 MAVP: 2068 kPa  
 S/N: TBA

**F-2231-05**  
**PRE-FILTER**  
 COALESCER JC0085-C  
 172 CM/HR @ 1310 kPa  
 MAVP: 3447 kPa  
 0.01 MICRON FILTER  
 c/w INTEGRAL FLOAT DRAIN

**F-2231-06**  
**AIR FILTER**  
 PARTICULATE JC0085-F  
 287 CM/HR @ 1310 kPa  
 MAVP: 3447 kPa  
 0.9 MICRON FILTER  
 MANUAL DRAIN

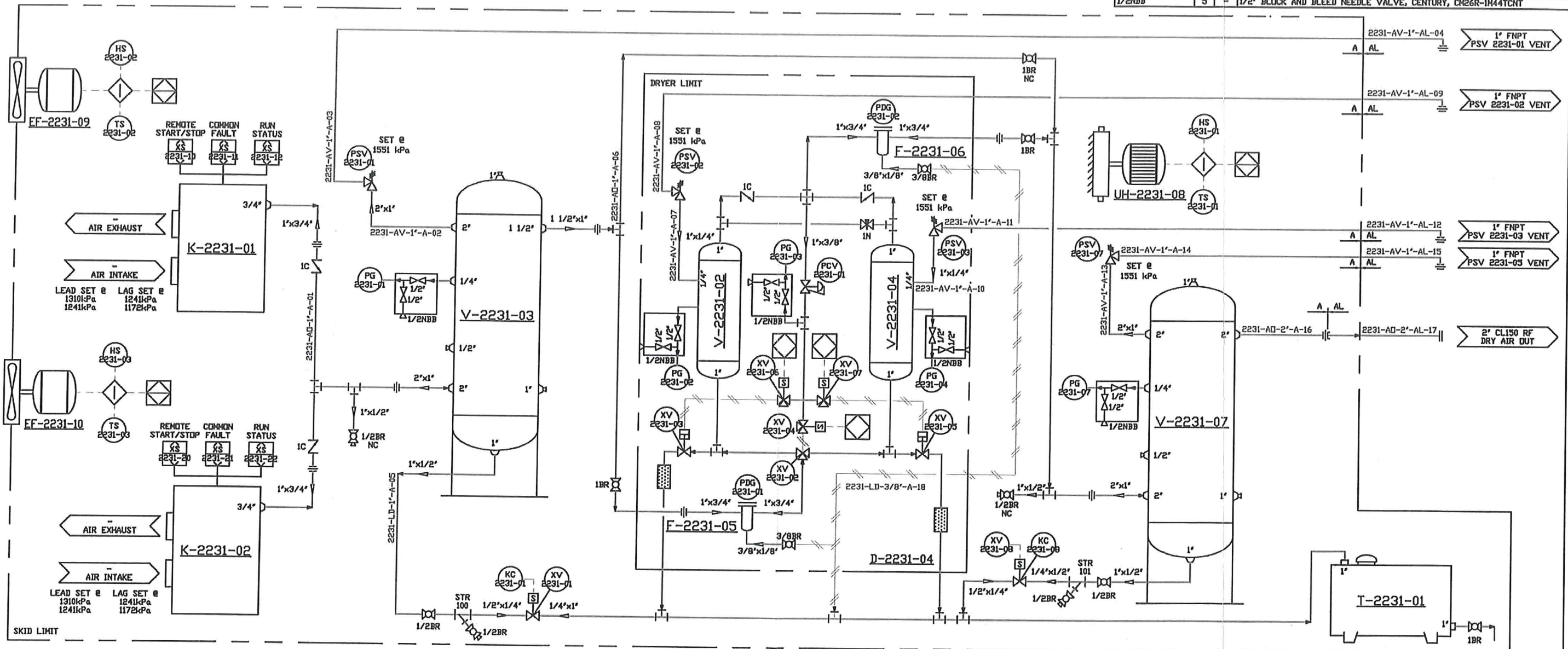
**UH-2231-08**  
**BUILDING HEATER**  
 PART# 2578  
 CALDRITECH  
 MODEL GE107CT480  
 10KV  
 480 VOLT, 3 PHASE

**EF-2231-09/10**  
**EXHAUST FAN**  
 ET12-1  
 120 VOLT, 1 PHASE  
 1/4HP  
 120V/1/60Hz  
 c/w HOOD

**V-2231-02/04**  
**AIR DRYER**  
 NORTHWEST NW75  
 CAPACITY: 127 CM/HR @ 689 kPa  
 MAVP: 2068 kPa  
 MAX INLET TEMP: 49°C

**T-2231-01**  
**LOAD TANK**  
 PLASTIC  
 CAPACITY: 379 LITRES  
 406mm VENTED LID  
 826mm WIDE x 711mm HIGH x 1245mm LONG

BILL OF MATERIALS			
TAG	QTY	PN	DESCRIPTION
PSV-2231-01/2/3/7	4	2572	PRESSURE SAFETY VALVE, MERCER, 1" x 1"NPT C DRIFICE, SET @ 1551kPa
PG-2231-01/2/3/4/7	5	1405	PRESSURE GAUGE, VIKKA, 0-300PSI, 4" DIAL x 1/2"NPT, LOWER MOUNT
STR-100/101	2	2284	Y-STRAINER, ALTA STRAINERS, 1/2"FNPT, 2000CL
XV-2231-01/8	2	-	SOLENOID VALVE, ASCO, 8262H202, 1/4"NPT, 2-WAY VALVE
KC-2231-01/8	2	-	ELECTRIC TIMER, ASCO, E-40 SECOND TIMER DN, 30 SECOND TO 45 MINUTE OFF
PDG-2231-01/2	2	-	DIFFERENTIAL PRESSURE INDICATOR, c/w F-101, F-202
XV-2231-04/6/7	3	-	EXHAUST SOLENOID VALVE, AIRTEK
XV-2231-02	1	-	INLET PILOT SOLENOID VALVE, AIRTEK 3-WAY, c/w DRYER
XV-2231-03/5	2	-	EXHAUST PILOT VALVE, c/w DRYER ASSEMBLY
PCV-2231-01	1	-	PURGE REGULATOR, PNEUMATIC, 1/2"NPT, 1724kPa MAX, 79°C, SET @ 207kPa
1BR	4	2291	1" NPT BALL VALVE, KF, REG PORT, 2000CL
1/2BR	6	2290	1/2" NPT BALL VALVE, KF, REG PORT, 2000CL
3/8BR	2	2289	3/8" NPT BALL VALVE, KF, REG PORT, 2000CL
IC	4	2071	1" NPT CHECK VALVE, 2160CL
1N	1	2573	1" NPT NEEDLE VALVE
1/2NDB	5	-	1/2" BLOCK AND BLEED NEEDLE VALVE, CENTURY, CM26R-1M44TCNT



**PIPING NOTES**  
 THREADED PIPE: 2" AND UNDER TO BE SA-106-GRB SCH80  
 THRD FITTINGS: CL3000 SA-105N  
 TUBING: 3/8" 316 SS WELDED 0.035 WALL  
 1/2" 316 SS WELDED 0.049 WALL  
 TUBING FITTINGS: SWAGelok SS

**GENERAL NOTES**  
 BUILDING: 10' 0" WIDE, 16' 0" LONG, SELF FRAMING  
 EAVE HEIGHTS: 8' 0" EAVE HEIGHT, 4:12 PITCH  
 BUILDING COLOUR: STONE GREY EXTERIOR, WHITE INTERIOR  
 PIPING COLOUR: GREY  
 SKID: 10' 0" WIDE, 16' 0" LONG  
 ELECTRICAL: ALL BY OTHERS

Piping Designed to meet ASME B31.3 (2014).



Dec 12, 2016

REV	DD/MM/YYYY	REVISION	BY	CHK	APP
1	09/12/2016	ADD LINE #'S, REVISED TAG #'S AS PER CUSTOMER NOTES	DF	NH	TB
0	29/11/2016	ISSUED FOR CONSTRUCTION	DF	NH	TB
REV	DD/MM/YYYY	REVISION	BY	CHK	APP



CLIENT: PARADOUNT RESOURCES c/o GAS LIQUIDS ENGINEERING	
INSTRUMENT AIR PACKAGE	
25HP DUAL INSTRUMENT AIR	
LSD: 06-18-066-04 V6N	
PART# DWG#	REV
XXXX 16182 DUAL-25HP-INST AIR PID	1

2016-0328-G-050-P

LINE LIST

LINE NUMBER	PIPE SPEC.	SERVICE	SIZE	SCH.	CLASS	MATERIAL / GRADE	C.A.	NOTES	DESIGN		TEST PRESS. PSI	PWHT	X-RAY	OTHER NDE	TEST MEDIUM	ORIGIN	TERMINATION
									PRESS. PSI	MAX. / MIN. TEMP. °F							
2231-AO-1"-A-01	A	AIR	1/2", 3/4", 1", 2"	SCH80	150CL	SA-106 GR B	1/16"	2	225	-20/315	337	N/A	N/A	VT	WATER	K-2231-01/K-2231-02	V-2231-03
2231-AV-1"-A-02	A	AIR	1", 2"	SCH80	150CL	SA-106 GR B	1/16"	2	225	-20/315	337	N/A	N/A	VT	WATER	V-2231-03	PSV-2231-01
2231-AV-1"-A-03	A	AIR	1"	SCH80	150CL	SA-106 GR B	1/16"	2	14.9	-20/650	N/A	N/A	N/A	VT	N/A	PSV-2231-01	2231-AV-1"-AL-04
2231-AV-1"-AL-04	AL	AIR	1"	SCH80	150CL	SA-333 GR 6	1/16"	2	14.9	-50/650	N/A	N/A	N/A	VT	N/A	2231-AV-1"-A-03	OFF-SKID
2231-LD-1"-A-05	A	AIR	1/2", 1"	SCH80	150CL	SA-106 GR B	1/16"	2	225	-20/315	337	N/A	N/A	VT	WATER	V-2231-03 / V-2231-07 / V-2231-02 / V2231-04	T-2231-01
2231-AO-1"-A-06	A	AIR	1", 1-1/2", 2"	SCH80	150CL	SA-106 GR B	1/16"	2	225	-20/315	337	N/A	N/A	VT	WATER	V-2231-03	V-2231-07 / V-2231-02 / V-2231-04 / 2231-LD-1"-A-05
2231-AV-1"-A-07	A	AIR	1/4", 1"	SCH80	150CL	SA-106 GR B	1/16"	2	225	-20/315	337	N/A	N/A	VT	WATER	V-2231-02	PSV-2231-02
2231-AV-1"-A-08	A	AIR	1"	SCH80	150CL	SA-106 GR B	1/16"	2	14.9	-20/650	N/A	N/A	N/A	VT	N/A	PSV-2231-02	2231-AV-1"-AL-09
2231-AV-1"-AL-09	AL	AIR	1"	SCH80	150CL	SA-333 GR 6	1/16"	2	14.9	-50/650	N/A	N/A	N/A	VT	N/A	2231-AV-1"-A-08	OFF-SKID
2231-AV-1"-A-10	A	AIR	1/4", 1"	SCH80	150CL	SA-106 GR B	1/16"	2	225	-20/315	337	N/A	N/A	VT	WATER	V-2231-04	PSV-2231-03
2231-AV-1"-A-11	A	AIR	1"	SCH80	150CL	SA-106 GR B	1/16"	2	14.9	-20/650	N/A	N/A	N/A	VT	N/A	PSV-2231-03	2231-AV-1"-AL-12
2231-AV-1"-AL-12	AL	AIR	1"	SCH80	150CL	SA-333 GR 6	1/16"	2	14.9	-50/650	N/A	N/A	N/A	VT	N/A	2231-AV-1"-A-11	OFF-SKID
2231-AV-1"-A-13	A	AIR	1", 2"	SCH80	150CL	SA-106 GR B	1/16"	2	225	-20/315	337	N/A	N/A	VT	WATER	V-2231-07	PSV-2231-07
2231-AV-1"-A-14	A	AIR	1"	SCH80	150CL	SA-106 GR B	1/16"	2	14.9	-20/650	N/A	N/A	N/A	VT	N/A	PSV-2231-07	2231-AV-1"-AL-15
2231-AV-1"-AL-15	AL	AIR	1"	SCH80	150CL	SA-333 GR 6	1/16"	2	14.9	-50/650	N/A	N/A	N/A	VT	N/A	2231-AV-1"-A-14	OFF-SKID
2231-AO-2"-A-16	A	AIR	2"	SCH80	150CL	SA-106 GR B	1/16"	2, 4	225	-20/315	337	N/A	N/A	VT	WATER	V-2231-07	2231-AO-2"-AL-17
2231-AO-2"-AL-17	AL	AIR	2"	SCH40	150CL	SA-333 GR 6	1/16"	1	225	-50/315	337	N/A	10%	VT	WATER	2231-AO-2"-A-16	OFF-SKID
2231-LD-3/8"-A-18	A	AIR	3/8"	0.035"	N/A	316 SS WELDED	N/A	3	225	-20/315	337	N/A	N/A	VT	WATER	PDG-2231-01 / PDG-2231-02	2231-LD-1"-A-05

PSV DATA:						GENERAL NOTES:	
DESIGNATION	MAKE	MODEL	SIZE	SPECIFICATION	SET @ PSI		
PSV-2231-01	MERCER	91-17C52V06C1	1" MNPT X 1" FNPT	ORIFICE - 0.062 SQ. IN.	225	CODE: ASME B31.3-2014	
PSV-2231-02	MERCER	91-17C52V06C1	1" MNPT X 1" FNPT	ORIFICE - 0.062 SQ. IN.	225	FITTINGS: A-105N, A-234WPB,	
PSV-2231-03	MERCER	91-17C52V06C1	1" MNPT X 1" FNPT	ORIFICE - 0.062 SQ. IN.	225	FLANGES: A-350-LF2 RFWN	
PSV-2231-07	MERCER	91-17C52V06C1	1" MNPT X 1" FNPT	ORIFICE - 0.062 SQ. IN.	225	GASKETS: RF SPIRAL WOUND 316SS, 1/8" THK.	
CUSTOMER: Paramount Resources c/o GLE						BOLTS & NUTS: B7M A-193/2HM A-194	
JOB #: 16182			DOCUMENT #: 16182 LINE LIST (16104-1501-01 PKG2231)			TUBE FITTINGS: 316 SS	
DRAWING #: 16182 DUAL-25HP-INST AIR PID REV 1			REVISION #: 0			1. WELDED LINE	
DATE: December 9, 2016			CREATED BY: Tasha McDonald			2. THREADED LINE	
						3. TUBING 4. SEE ATTACHED SPEC DEVIATION	



Piping designed to meet ASME B31.3 (2014)

Dec 12, 2016

ASDA  
SAFETY CODES ACT - PROVINCE OF ALBERTA  
ACCEPTED  
OP - 0328 - G - 050 - P

2016-12-21  
Date  
Signed: *Xing Liu*  
XING LIU, P.Eng.  
DESIGN SURVEY ENGINEER



Revision 4	May 1, 2015
PR-ES-01 Piping Class	A
CLASS:	150
RATING:	ASME/ANSI B16.5

SERVICE:	Hydrocarbon, unprocessed produced fluids, produced water, slop, fuel gas, flare, drain, glycol/water		
Design Code	ASME B31.3 – (2014)		
Design Pressure:	1 960 kPag (285 psig) @ 38°C (100°F). Design pressure derates with temperature per ratings of ASME B16.5	Note 1	
Design Temperature:	-29 to 350°C (-20 to 650°F)	Note 2, 56	
Corrosion Allowance:	1.6 mm (0.0625 in)	Hydrotest Pressure:	2940 kPag (428 psig)
Inspection Requirements:	Random 10% RT	PWHT:	wt > 19 mm (¾")

PIPE:	NPS	WALL THICKNESS	END CONNECTIONS	DESCRIPTION	NOTES
	¼ to 1½	Sch 80 (XS)	Scrd/SW	ASTM A106 Grade B (SMLS) PE	3, 4, 5
	2 to 10	Sch 40	BW	ASTM A106 Grade B (SMLS) BE	
	12 to 16	STD	BW	ASTM A106 Grade B (SMLS) BE	

Components:	ITEM	NPS	RATING	END CONNECTIONS	DESCRIPTION	NOTES
	INSERT BLINDS	¼ to 16	Class 150	RF	ASTM A105/NA516 Grade 70	14
	BLIND FLANGE	¼ to 16	Class 150	RF	ASTM A105N	
	BOLTING (Nuts)				ASTM A194 Grade 2H	18
	BOLTING (Studs)				ASTM A193 Grade B7	19
	BUSHING	¼ to 1½	Class 3000	Scrd	ASTM A105N	3, 6, 7, 31
	CAP	¼ to 1½	Class 3000	Scrd/SW	ASTM A105N	3, 7, 31
	CAP	2 to 16	Match Pipe	BW	ASTM A234 Grade WPB	8
	COUPLING , Full and Half	¼ to 1½	Class 3000	Scrd/SW	ASTM A105N	3, 7, 31
	CROSS	¼ to 1½	Class 3000	Scrd/SW	ASTM A105N	3, 7, 31
	ELBOW , 45° & 90°, Long Radius	¼ to 1½	Class 3000	Scrd/SW	ASTM A105N	3, 7, 31
	ELBOW, 45° & 90° Straight & Reducing, Long Radius	2 to 16	Match Pipe	BW	ASTM A234 Grade WPB	8, 9
	ELBOLET	¼ to 1½	Class 3000	Scrd/SW	ASTM A105N	3, 7, 31
	FLANGE	¼ to 1½	Class 150	Scrd/SW	ASTM A105N	10
	FLANGE	2 to 16	Class 150	RFWN	ASTM A105N	10
	GASKETS	¼ to 16	Class 150	RF	Spiral wound 304 SS, flexible graphite filler	15
	NIPPLES (min length 100 mm)	¼ to 1½	Sch 80 (XS)	Scrd or PE	ASTM A106 Grade B SMLS	3
	ORIFICE FLANGES	2 to 12	Class 300	RF	ASTM A105N, bored to suite c/w 1/2 in taps and jack bolts	16
	PLUGS (Hex Head)	¼ to 1½	Class 3000	Scrd	ASTM A105N	3, 7, 31
	REDUCERS (Concentric & Eccentric)	2 to 16	STD	BW	ASTM A 234 Grade WPB	8
	RETURN (Long Radius)	2 to 16	STD	BW	ASTM A 234 Grade WPB	8
	SOCKOLET	¼ to 1½	Class 3000	SW	ASTM A105N	3, 11, 31
	SWAGE	¼ to 2	Class 3000	Scrd or PE	ASTM A105N or ASTM A234 WPB	3, 12, 30, 31
	TEE (Straight & Reducing)	¼ to 1½	Class 3000	Scrd/SW	ASTM A105N	3, 7, 31
	TEE (Straight & Reducing)	2 to 16	Std	BW	ASTM A 234 Grade WPB	8
	THREADOLET	¼ to 1½	Class 3000	Scrd	ASTM A105N	3, 11, 31
	TUBING	¾ to ½ (OD)	0.035 in wall	Tube/Scrd	A179 Electrogalv. CS or A269 Gr316 SS with 316SS compression fittings	17
	UNION	¼ to 1½	Class 3000	Scrd/SW	ASTM A105N	3, 13, 31
	WELDOLET	2 to 8	STD	BW	ASTM A105N	11

9P - 0328 - G - 050 - P



		Revision 4	May 1, 2015
		PR-ES-01 Piping Class	A
		CLASS:	150
		RATING:	ASME/ANSI B16.5
SERVICE:	Hydrocarbon, unprocessed produced fluids, produced water, slop, fuel gas, flare, drain, glycol/water		
Design Code	ASME B31.3 – (2014)		
Design Pressure:	1 960 kPag (285 psig) @ 38°C (100°F). Design pressure derates with temperature per ratings of ASME B16.5		Note 1
Design Temperature:	-29 to 350°C (-20 to 650°F)		Note 2, 56
Corrosion Allowance:	1.6 mm (0.0625 in)	Hydrotest Pressure:	2940 kPag (428 psig)
Inspection Requirements:	Random 10% RT	PWHT:	wt > 19 mm (¾")

Valves:	ITEM	NPS	RATING	END CONNECTIONS	DESCRIPTION	NOTES
	BALL	¾ to 1½	Class 2000	Scrd/SW	A105N / A216 WCB body, plated trim	3, 20, 21, 23, 56
	BALL	2 to 16	Class 150	RF	A105N / A216 WCB body, plated trim	20, 22, 23, 56
	CHECK	¾ to 1½	Class 800	Scrd/SW	A105N / A216 WCB body, Integral/Buna trim	23, 24, 56
	CHECK	2 to 16	Class 150	RF	A105N / A216 WCB body, Integral/Buna trim	23, 24, 56
	GATE	¾ to 1½	Class 800	Scrd/SW	A105N / A216 WCB body, F6 / HF trim	23, 25, 56
	GATE	2 to 16	Class 150	RF	A105N / A216 WCB body, F6 / HF trim	23, 26, 56
	GLOBE	¾ to 1½	Class 800	Scrd/SW	A105N / A216 WCB body, F6 / HF trim	23, 25, 56
	GLOBE	2 to 16	Class 150	RF	A105N / A216 WCB body, F6 / HF trim	23, 25, 56
	BUTTERFLY	2 to 16	Class 150	RF	A105N / A216 WCB body	32, 56
	NEEDLE	½ to ¾	Class 3000	Scrd/SW	A105 body, 316 SS trim	27, 56
NOTES:	NOTE #	DESCRIPTION				
	1	Design Pressures based on B16.5 Table 2-1.1. Table values not direct conversion from Metric to Imperial				
	2	Temperature deration above 38°C based on B16.5 Table 2-1-1 or valve design limitation				
	3	Piping smaller than NPS 1increased to Pipe Schedule XXS in vibrating service. Design engineer to calculate all mechanical loads. Consideration must be given to potential fatigue in vibrating service.				
	4	Glycol piping must be socket welded.				
	5	Thread Sealant Jet-Lube TF-15 or equal. For fuel gas systems at less than 15 psi, use Jetlube V-2 or alterate ULC-S642 approved.				
	6	Bushings not permitted under cyclic service (pressure and/or temperature), vibrating service (i.e. near rotating equipment), or corrosive service. Busing size must be less than 2 to 1 in size ratio. Major dimension must not exceed 1-1/2" NPS.				
	7	Forged steel fitting must meet the requirements of ASME B16.11.				
	8	Buttwelding fitting must meet the requirements of ASME B16.9.				
	9	Short radius elbow and returns shall not be used unless they satisfy the specification of the pipe and pressure rating restrictions imposed by ASME B16.28, Para. 2 (derated to 80% max. allowable stress value).				
	10	ID of pipe bored to match pipe ID. Alteration of fitting must be performed by a fabricator with authorization to modify registered fitting.				
	11	Forged branch outlet fittings must meet the requirements of MSS SP-97. Must specify both run pipe and schedule, and branch pipe and schedule with order as fitting must be sized to provide adequate reinforcement on the run pipe, as well as match wall of branch pipe.				
	12	Swage nipples must meet the requirements of MSS SP-95. Bore and connections must meet the pipe requirements.				
	13	Steel Unions must meet the requirements of MSS SP-83. Conisderation must be given to grounding connection.				
	14	Blinds must meet the requirements of ASME B16.48.				
	15	Gasket must meet the requirements of ASME B16.20. Filler must meet the requirements for temperature and pressure.				
	16	Orifice Flanges must meet the requirements of ASME B16.36. For applications on pipe larger than NPS 12, pressure taps shall be installed in piping a distance 1D upstream and 0.5D downstream of the orifice plate.				
	17	Compression fitting components from different manufacturers must not be interchanged. Compression fitting valves must meet or exceed the pressure requirement and materials of construction of all valves listed in piping class.				
	18	Two nuts required per stud.				
	19	Studs must be lubricated with a molybdenum based lubricant prior to assembly.				
	20	Design Engineer to select and or specify full port vs. reduced port, trunnion mount vs. floating ball, length pattern. All actuated valves shall be trunnion mounted.				
	21	Valve may be constructed of bolted body or threaded body.				
	22	Valve must not be one piece welded body.				
	23	All valves shall conform to: ASME B16.34, API 600, and API 607 for ASME B31.3 code piping.				
	24	Design Engineer to specify check valve type and any additional required design details.				
	25	OS & Y, bolted bonnet, Design Engineer to specify full or reduced port.				
	26	OS & Y, Design Engineer to specify full or reduced port.				
	27	Screwed Bonnet, locked				
	30	Swages must match end connection and wall thickness or schedule to matching piping dimension				
	31	Threaded fittings Class 2000 acceptable				
	32	Design Engineer to select seat material based on service				
	56	All components must be reviewed for suitability to operate above 149C. Parts made of elastomers may not be suitable for temperatures above 149C. Metal seated valves may be required above 149C. Design engineer to confirm suitability.				



Revision 4	May 1, 2015
PR-ES-01 Piping Class	AL
CLASS:	150
RATING:	ASME/ANSI B16.5

SERVICE:	LOW TEMP - Hydrocarbon, unprocessed produced fluids, produced water, slop, fuel gas, flare, drain, glycol/water		
Design Code	ASME B31.3 -- (2014)		
Design Pressure:	1 960 kPag (285 psig) @ 38°C (100°F). Design pressure derates with temperature per ratings of ASME B16.5	Note 1	
Design Temperature:	-45 to 350°C (-50 to 650°F)	Note 2, 56	
Corrosion Allowance:	1.6 mm (0.0625 in)	Hydrotest Pressure:	2940 kPag (428 psig)
Inspection Requirements:	Random 10% RT	PWHT:	wt > 19 mm (¾")

PIPE:	NPS	WALL THICKNESS	END CONNECTIONS	DESCRIPTION	NOTES	
	¼ to 1½	Sch 80 (XS)	Scrd/SW	ASTM A333 Grade 6 (SMLS) PE	3, 4, 5	
	2 to 10	Sch 40	BW	ASTM A333 Grade 6 (SMLS) BE		
	12 to 16	STD	BW	ASTM A333 Grade 6 (SMLS) BE		
Components:	ITEM	NPS	RATING	END CONNECTIONS	DESCRIPTION	NOTES
	INSERT BLINDS	¼ to 16	Class 150	RF	ASTM A350 LF2 Cl. 1/A516 Grade 70N	14, 33
	BLIND FLANGE	¼ to 16	Class 150	RF	ASTM A350 LF2 Cl. 1	
	BOLTING (Nuts)				ASTM A194 Grade 2HM	18
	BOLTING (Studs)				ASTM A193 Grade B7M	19
	BUSHING	¼ to 1½	Class 3000	Scrd	ASTM A350 LF2 Cl. 1	3, 6, 7, 31
	CAP	¼ to 1½	Class 3000	Scrd/SW	ASTM A350 LF2 Cl. 1	3, 7, 31
	CAP	2 to 16	Match Pipe	BW	ASTM A420 Grade WPL6	8
	COUPLING, Full and Half	¼ to 1½	Class 3000	Scrd/SW	ASTM A350 LF2 Cl. 1	3, 7, 31
	CROSS	¼ to 1½	Class 3000	Scrd/SW	ASTM A350 LF2 Cl. 1	3, 7, 31
	ELBOW, 45° & 90°, Long Radius	¼ to 1½	Class 3000	Scrd/SW	ASTM A350 LF2 Cl. 1	3, 7, 31
	ELBOW, 45° & 90° Straight & Reducing, Long Radius	2 to 16	Match Pipe	BW	ASTM A420 Grade WPL6	8, 9
	ELBOLET	¼ to 1½	Class 3000	Scrd/SW	ASTM A350 LF2 Cl. 1	3, 7, 31
	FLANGE	¼ to 1½	Class 150	Scrd/SW	ASTM A350 LF2 Cl. 1	10
	FLANGE	2 to 16	Class 150	RFWN	ASTM A350 LF2 Cl. 1	10
	GASKETS	¼ to 16	Class 150	RF	Spiral wound 304 SS, flexible graphite filler	15
	NIPPLES (min length 100 mm)	¼ to 1½	Sch 80 (XS)	Scrd or PE	ASTM A333 Grade 6 (SMLS)	3
	ORIFICE FLANGES	2 to 12	Class 300	RF	ASTM A350 LF2 Cl. 1, bored to suite clw ½ in taps and jack bolts	16
	PLUGS (Hex Head)	¼ to 1½	Class 3000	Scrd	ASTM A350 LF2 Cl. 1	3, 7, 31
	REDUCERS (Concentric & Eccentric)	2 to 16	STD	BW	ASTM A420 Grade WPL6	8
	RETURN (Long Radius)	2 to 16	STD	BW	ASTM A420 Grade WPL6	8
	SOCKOLET	¼ to 1½	Class 3000	SW	ASTM A350 LF2 Cl. 1	3, 11, 31
	SWAGE	¼ to 2	Class 3000	Scrd or PE	ASTM A350 LF2 Cl. 1 or ASTM A420 Grade WPL6	3, 12, 30, 31
	TEE (Straight & Reducing)	¼ to 1½	Class 3000	Scrd/SW	ASTM A350 LF2 Cl. 1	3, 7, 31
	TEE (Straight & Reducing)	2 to 16	Std	BW	ASTM A420 Grade WPL6	8
	THREDOLET	¼ to 1½	Class 3000	Scrd	ASTM A350 LF2 Cl. 1	3, 11, 31
	TUBING	¼ to ½ (OD)	0.035 in wall	Tube/Scrd	A269 Gr316 SS with 316SS compression fittings	17
	UNION	¼ to 1½	Class 3000	Scrd/SW	ASTM A350 LF2 Cl. 1	3, 13, 31
	WELDOLET	2 to 8	STD	BW	ASTM A350 LF2 Cl. 1	11

0320 - 0220 - 0220



Revision 4	May 1, 2015
PR-ES-01 Piping Class	AL
CLASS:	150
RATING:	ASME/ANSI B16.5

<b>SERVICE:</b>	LOW TEMP - Hydrocarbon, unprocessed produced fluids, produced water, slop, fuel gas, flare, drain, glycol/water		
<b>Design Code</b>	ASME B31.3 – (2014)		
<b>Design Pressure:</b>	1 960 kPag (285 psig) @ 38°C (100°F). Design pressure derates with temperature per ratings of ASME B16.5	Note 1	
<b>Design Temperature:</b>	-45 to 350°C (-50 to 650°F)	Note 2, 56	
<b>Corrosion Allowance:</b>	1.6 mm (0.0625 in)	<b>Hydrotest Pressure:</b>	2940 kPag (428 psig)
<b>Inspection Requirements:</b>	Random 10% RT	<b>PWHT:</b>	wt > 19 mm (¾")

Valves:	ITEM	NPS	RATING	END CONNECTIONS	DESCRIPTION	NOTES
	BALL	¾ to 1½	Class 2000	Scrd/SW	A350 LF2 Cl.1 / A352 LCC body, 316 SS trim	3, 20, 21, 23, 56
	BALL	2 to 16	Class 150	RF	A350 LF2 Cl.1 / A352 LCC body, 316 SS trim	20, 22, 23, 56
	CHECK	¾ to 1½	Class 800	Scrd/SW	A350 LF2 Cl.1 / A352 LCC body, Integral/Buna trim	23, 24, 56
	CHECK	2 to 16	Class 150	RF	A350 LF2 Cl.1 / A352 LCC body, Integral/Buna trim	23, 24, 56
	GATE	¾ to 1½	Class 800	Scrd/SW	A350 LF2 Cl.1 / A352 LCC body, F6 / HF trim	23, 25, 56
	GATE	2 to 16	Class 150	RF	A350 LF2 Cl.1 / A352 LCC body, F6 / HF trim	23, 26, 56
	GLOBE	¾ to 1½	Class 800	Scrd/SW	A350 LF2 Cl.1 / A352 LCC body, F6 / HF trim	23, 25, 56
	GLOBE	2 to 16	Class 150	RF	A350 LF2 Cl.1 / A352 LCC body, F6 / HF trim	23, 25, 56
	BUTTERFLY	2 to 16	Class 150	RF	A350 LF2 Cl.1 / A352 LCC body	32, 56
	NEEDLE	½ to ¾	Class 3000	Scrd	ASTM A182 F316 body, 316 SS trim	27, 56

NOTES:	NOTE #	DESCRIPTION
	1	Design Pressures based on B16.5 Table 2-1.1. Table values not direct conversion from Metric to Imperial
	2	Temperature deration above 38°C based on B16.5 Table 2-1-1 or valve design limitation
	3	Piping smaller than NPS 1increased to Pipe Schedule XXS in vibrating service. Design engineer to calculate all mechanical loads. Consideration must be given to potential fatigue in vibrating service.
	4	Glycol piping must be socket welded.
	5	Thread Sealant Jet-Lube TF-15 or equal. For fuel gas systems at less than 15 psi, use Jetlube V-2 or alternate ULC-S642 approved.
	6	Bushings not permitted under cyclic service (pressure and/or temperature), vibrating service (i.e. near rotating equipment), or corrosive service. Busing size must be less than 2 to 1 in size ratio. Major dimension must not exceed 1-1/2" NPS.
	7	Forged steel fitting must meet the requirements of ASME B16.11.
	8	Buttwelding fitting must meet the requirements of ASME B16.9.
	9	Short radius elbow and returns shall not be used unless they satisfy the specification of the pipe and pressure rating restrictions imposed by ASME B16.28, Para. 2 (derated to 80% max. allowable stress value).
	10	ID of pipe bored to match pipe ID. Alteration of fitting must be performed by a fabricator with authorization to modify registered fitting.
	11	Forged branch outlet fittings must meet the requirements of MSS SP-97. Must specify both run pipe and schedule, and branch pipe and schedule with order as fitting must be sized to provide adequate reinforcement on the run pipe, as well as match wall of branch pipe.
	12	Swage nipples must meet the requirements of MSS SP-95. Bore and connections must meet the pipe requirements.
	13	Steel Unions must meet the requirements of MSS SP-83. Consideration must be given to grounding connection.
	14	Blinds must meet the requirements of ASME B16.48.
	15	Gasket must meet the requirements of ASME B16.20. Filler must meet the requirements for temperature and pressure.
	16	Orifice Flanges must meet the requirements of ASME B16.36. For applications on pipe larger than NPS 12, pressure taps shall be installed in piping a distance 1D upstream and 0.5D downstream of the orifice plate.
	17	Compression fitting components from different manufacturers must not be interchanged. Compression fitting valves must meet or exceed the pressure requirement and materials of construction of all valves listed in piping class.
	18	Two nuts required per stud.
	19	Studs must be lubricated with a molybdenum based lubricant prior to assembly.
	20	Design Engineer to select and or specify full port vs. reduced port, trunnion mount vs. floating ball, length pattern. All actuated valves shall be trunnion mounted.
	21	Valve may be constructed of bolted body or threaded body.
	22	Valve must not be one piece welded body.
	23	All valves shall conform to: ASME B16.34, API 600, and API 607 for ASME B31.3 code piping.
	24	Design Engineer to specify check valve type and any additional required design details.
	25	OS & Y, bolted bonnet, Design Engineer to specify full or reduced port.
	26	OS & Y, Design Engineer to specify full or reduced port.
	27	Screwed Bonnet, locked
	30	Swages must match end connection and wall thickness or schedule to matching piping dimension
	31	Threaded fittings Class 2000 acceptable
	32	Design Engineer to select seat material based on service
	33	ASTM A 516 Grade 70N Mateial must be impact tested for low temperature service
	56	All components must be reviewed for suitability to operate above 149C. Parts made of elastomers may not be suitable for temperatures above 149C. Metal seated valves may be required above 149C. Design engineer to confirm suitability.



**K-2231-01/02**  
**AIR COMPRESSOR**  
 PART# ROTORCOMP RS25ENC  
 110 CM/HR @ 1310 kPa  
 MAWP: 1448 kPa  
 MADP: 1310 kPa  
 c/w 25HP MOTOR 3600RPM

**V-2231-03**  
**WET AIR RECEIVER**  
 PART# VERTICAL  
 MAWP: 2068 kPa @ 204°C  
 MDHT: -20°F @ 2068 kPa  
 120 GAL., 24" Ø x 67" LG.

**V-2231-07**  
**DRY AIR RECEIVER**  
 PART# VERTICAL  
 MAWP: 2068 kPa @ 204°C  
 MDHT: -29°C @ 1379 kPa  
 240 GAL., 30" Ø x 84" LG.

**D-2231-04**  
**HEATLESS AIR DRYER**  
 PART#  
 119 CM/HR @ 1310 kPa  
 120V/1PH/60Hz  
 MAWP: 2068 kPa  
 S/N: TBA

**F-2231-05**  
**PRE-FILTER**  
 COALESCER JC0085-C  
 172 CM/HR @ 1310 kPa  
 MAWP: 3447 kPa  
 0.01 MICRON FILTER  
 c/w INTEGRAL FLOAT DRAIN

**F-2231-06**  
**AIR FILTER**  
 PARTICULATE JC0085-F  
 287 CM/HR @ 1310 kPa  
 MAWP: 3447 kPa  
 0.9 MICRON FILTER  
 MANUAL DRAIN

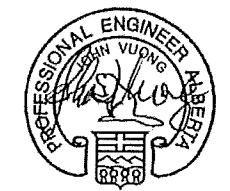
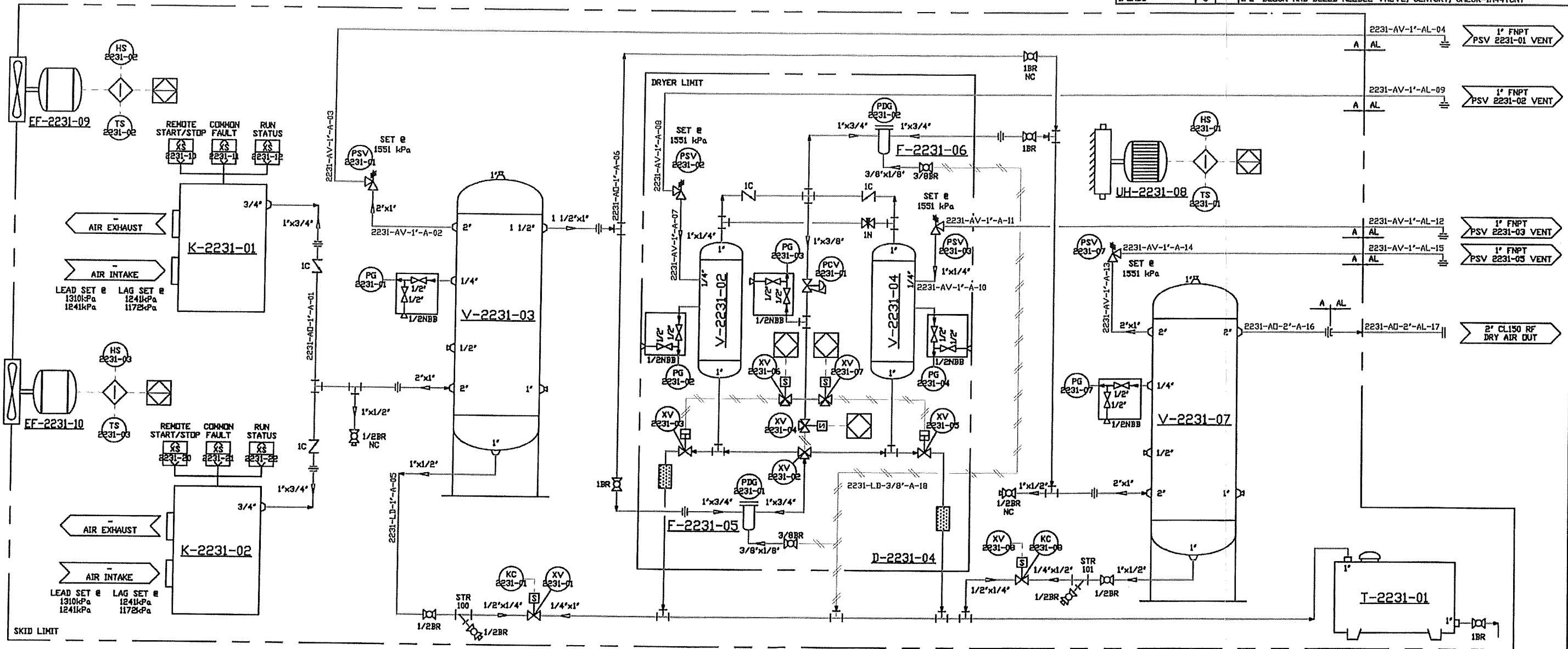
**UH-2231-08**  
**BUILDING HEATER**  
 PART# 2578  
 CALDRITECH  
 MODEL GE107CT480  
 10KW  
 480 VOLT, 3 PHASE

**EF-2231-09/10**  
**EXHAUST FAN**  
 ET12-1  
 120 VOLT, 1 PHASE  
 1/4HP  
 120V/1/60Hz  
 c/w HOOD

**V-2231-02/04**  
**AIR DRYER**  
 NORTHWEST NW75  
 CAPACITY: 127 CM/HR @ 689 kPa  
 MAWP: 2068 kPa  
 MAX INLET TEMP: 49°C

**T-2231-01**  
**LOAF TANK**  
 PLASTIC  
 CAPACITY: 379 LITRES  
 406mm VENTED LID  
 826mm WIDE x 711mm HIGH x 1245mm LONG

BILL OF MATERIALS			
TAG	QTY	PN	DESCRIPTION
PSV-2231-01/2/3/7	4	2572	PRESSURE SAFETY VALVE, MERCER, 1" x 1"NPT C DRIFICE, SET @ 1551kPa
PG-2231-01/2/3/4/7	5	1405	PRESSURE GAUGE, WIKA, 0-300PSI, 4" DIAL x 1/2"NPT, LOWER HDUNT
STR-100/101	2	2384	Y-STRAINER, ALTA STRAINERS, 1/2"FNPT, 2000CL
XV-2231-01/8	2	-	SOLENOID VALVE, ASCO, 8262H202, 1/4"NPT, 2-WAY VALVE
KC-2231-01/8	2	-	ELECTRIC TIMER, ASCO, 2-40 SECOND TIMER DN, 30 SECOND TO 45 MINUTE OFF
PDG-2231-01/2	2	-	DIFFERENTIAL PRESSURE INDICATOR, c/w F-101, F-202
XV-2231-04/6/7	3	-	EXHAUST SOLENOID VALVE, AIRTEK
XV-2231-02	1	-	INLET PILOT SOLENOID VALVE, AIRTEK 3-WAY, c/w DRYER
XV-2231-03/5	2	-	EXHAUST PILOT VALVE, c/w DRYER ASSEMBLY
PCV-2231-01	1	-	PURGE REGULATOR, PNEUMATIC, 1/2"NPT, 1724kPa MAX, 79°C, SET @ 207kPa
1BR	4	2291	1" NPT BALL VALVE, KF, REG PORT, 2000CL
1/2BR	6	2290	1/2" NPT BALL VALVE, KF, REG PORT, 2000CL
3/8BR	2	2289	3/8" NPT BALL VALVE, KF, REG PORT, 2000CL
1C	4	2071	1" NPT CHECK VALVE, 2160CL
1N	1	2573	1" NPT NEEDLE VALVE
1/2NBB	5	-	1/2" BLOCK AND BLEED NEEDLE VALVE, CENTURY, CM26R-1H44TCNT



Piping Designed to meet ASME B31.3 (2014).

Dec 12, 2016

**PIPING NOTES**

THREADED PIPE:	2" AND UNDER TO BE SA-106-GRB SCH.80
THRD FITTINGS:	CL3000 SA-105N
TUBING:	3/8" 316 SS WELDED 0.035 WALL
TUBING FITTINGS:	1/2" 316 SS WELDED 0.049 WALL
	SWAGelok SS

**GENERAL NOTES**

BUILDING:	10' 0" WIDE, 16' 0" LONG, SELF FRAMING
EAVE HEIGHTS:	8' 0" EAVE HEIGHT, 4:12 PITCH
BUILDING COLOUR:	STONE GREY EXTERIOR, WHITE INTERIOR
PIPING COLOUR:	GREY
SKID:	10' 0" WIDE, 16' 0" LONG
ELECTRICAL:	ALL BY OTHERS

REV	DD/MM/YYYY	REVISION	BY	CHK	APP
1	09/12/2016	ADD LINE #'S. REVISED TAG #'S AS PER CUSTOMER NOTES	DF	NH	TB
0	29/11/2016	ISSUED FOR CONSTRUCTION	DF	NH	TB



CLIENT: PARAMOUNT RESOURCES c/o GAS LIQUIDS ENGINEERING

**INSTRUMENT AIR PACKAGE**  
 25HP DUAL INSTRUMENT AIR  
 LSH: 06-18-066-04 VGH

PART#	DWG#	REV
XXXX	16182 DUAL-25HP-INST AIR PID	1

LINE LIST

LINE NUMBER	PIPE SPEC.	SERVICE	SIZE	SCH.	CLASS	MATERIAL / GRADE	C.A.	NOTES	DESIGN		TEST PRESS. PSI	PWHT	X-RAY	OTHER NDE	TEST MEDIUM	ORIGIN	TERMINATION
									PRESS. PSI	MAX. / MIN. TEMP. °F							
2231-AO-1"-A-01	A	AIR	1/2", 3/4", 1", 2"	SCH80	150CL	SA-106 GR B	1/16"	2	225	-20/315	337	N/A	N/A	VT	WATER	K-2231-01/K-2231-02	V-2231-03
2231-AV-1"-A-02	A	AIR	1", 2"	SCH80	150CL	SA-106 GR B	1/16"	2	225	-20/315	337	N/A	N/A	VT	WATER	V-2231-03	PSV-2231-01
2231-AV-1"-A-03	A	AIR	1"	SCH80	150CL	SA-106 GR B	1/16"	2	14.9	-20/650	N/A	N/A	N/A	VT	N/A	PSV-2231-01	2231-AV-1"-AL-04
2231-AV-1"-AL-04	AL	AIR	1"	SCH80	150CL	SA-333 GR 6	1/16"	2	14.9	-50/650	N/A	N/A	N/A	VT	N/A	2231-AV-1"-A-03	OFF-SKID
2231-LD-1"-A-05	A	AIR	1/2", 1"	SCH80	150CL	SA-106 GR B	1/16"	2	225	-20/315	337	N/A	N/A	VT	WATER	V-2231-03 / V-2231-07 / V-2231-02 / V2231-04	T-2231-01
2231-AO-1"-A-06	A	AIR	1", 1-1/2", 2"	SCH80	150CL	SA-106 GR B	1/16"	2	225	-20/315	337	N/A	N/A	VT	WATER	V-2231-03	V-2231-07 / V-2231-02 / V-2231-04 / 2231-LD-1"-A-05
2231-AV-1"-A-07	A	AIR	1/4", 1"	SCH80	150CL	SA-106 GR B	1/16"	2	225	-20/315	337	N/A	N/A	VT	WATER	V-2231-02	PSV-2231-02
2231-AV-1"-A-08	A	AIR	1"	SCH80	150CL	SA-106 GR B	1/16"	2	14.9	-20/650	N/A	N/A	N/A	VT	N/A	PSV-2231-02	2231-AV-1"-AL-09
2231-AV-1"-AL-09	AL	AIR	1"	SCH80	150CL	SA-333 GR 6	1/16"	2	14.9	-50/650	N/A	N/A	N/A	VT	N/A	2231-AV-1"-A-08	OFF-SKID
2231-AV-1"-A-10	A	AIR	1/4", 1"	SCH80	150CL	SA-106 GR B	1/16"	2	225	-20/315	337	N/A	N/A	VT	WATER	V-2231-04	PSV-2231-03
2231-AV-1"-A-11	A	AIR	1"	SCH80	150CL	SA-106 GR B	1/16"	2	14.9	-20/650	N/A	N/A	N/A	VT	N/A	PSV-2231-03	2231-AV-1"-AL-12
2231-AV-1"-AL-12	AL	AIR	1"	SCH80	150CL	SA-333 GR 6	1/16"	2	14.9	-50/650	N/A	N/A	N/A	VT	N/A	2231-AV-1"-A-11	OFF-SKID
2231-AV-1"-A-13	A	AIR	1", 2"	SCH80	150CL	SA-106 GR B	1/16"	2	225	-20/315	337	N/A	N/A	VT	WATER	V-2231-07	PSV-2231-07
2231-AV-1"-A-14	A	AIR	1"	SCH80	150CL	SA-106 GR B	1/16"	2	14.9	-20/650	N/A	N/A	N/A	VT	N/A	PSV-2231-07	2231-AV-1"-AL-15
2231-AV-1"-AL-15	AL	AIR	1"	SCH80	150CL	SA-333 GR 6	1/16"	2	14.9	-50/650	N/A	N/A	N/A	VT	N/A	2231-AV-1"-A-14	OFF-SKID
2231-AO-2"-A-16	A	AIR	2"	SCH80	150CL	SA-106 GR B	1/16"	2, 4	225	-20/315	337	N/A	N/A	VT	WATER	V-2231-07	2231-AO-2"-AL-17
2231-AO-2"-AL-17	AL	AIR	2"	SCH40	150CL	SA-333 GR 6	1/16"	1	225	-50/315	337	N/A	10%	VT	WATER	2231-AO-2"-A-16	OFF-SKID
2231-LD-3/8"-A-18	A	AIR	3/8"	0.035"	N/A	316 SS WELDED	N/A	3	225	-20/315	337	N/A	N/A	VT	WATER	PDG-2231-01 / PDG-2231-02	2231-LD-1"-A-05

PSV DATA:

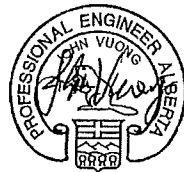
GENERAL NOTES:

DESIGNATION	MAKE	MODEL	SIZE	SPECIFICATION	SET @ PSI
PSV-2231-01	MERCER	91-17C52V06C1	1" MNPT X 1" FNPT	ORIFICE - 0.062 SQ. IN.	225
PSV-2231-02	MERCER	91-17C52V06C1	1" MNPT X 1" FNPT	ORIFICE - 0.062 SQ. IN.	225
PSV-2231-03	MERCER	91-17C52V06C1	1" MNPT X 1" FNPT	ORIFICE - 0.062 SQ. IN.	225
PSV-2231-07	MERCER	91-17C52V06C1	1" MNPT X 1" FNPT	ORIFICE - 0.062 SQ. IN.	225

CUSTOMER: Paramount Resources c/o GLE  
 JOB #: 16182  
 DRAWING #: 16182 DUAL-25HP-INST AIR PID REV 1  
 DATE: December 9, 2016

DOCUMENT #: 16182 LINE LIST (16104-1501-01 PKG2231)  
 REVISION #: 0  
 CREATED BY: Tasha McDonald

CODE: ASME B31.3-2014  
 FITTINGS: A-105N, A-234WPB,  
 FLANGES: A-350-LF2 RFWN  
 GASKETS: RF SPIRAL WOUND 316SS, 1/8" THK.  
 BOLTS & NUTS: B7M A-193/2HM A-194  
 TUBE FITTINGS: 316 SS  
 1. WELDED LINE  
 2. THREADED LINE  
 3. TUBING 4. SEE ATTACHED SPEC DEVIATION



Piping designed to meet ASME B31.3 (2014)

Dec 12, 2016



Revision 4	May 1, 2015
PR-ES-01 Piping Class	A
CLASS:	150
RATING:	ASME/ANSI B16.5

SERVICE:	Hydrocarbon, unprocessed produced fluids, produced water, slop, fuel gas, flare, drain, glycol/water		
Design Code	ASME B31.3 – (2014)		
Design Pressure:	1 960 kPag (285 psig) @ 38°C (100°F). Design pressure derates with temperature per ratings of ASME B16.5	Note 1	
Design Temperature:	-29 to 350°C (-20 to 650°F)	Note 2, 56	
Corrosion Allowance:	1.6 mm (0.0625 in)	Hydrotest Pressure:	2940 kPag (428 psig)
Inspection Requirements:	Random 10% RT	PWHT:	wt > 19 mm (¾")

PIPE:	NPS	WALL THICKNESS	END CONNECTIONS	DESCRIPTION	NOTES
	¼ to 1½	Sch 80 (XS)	Scrd/SW	ASTM A106 Grade B (SMLS) PE	3, 4, 5
	2 to 10	Sch 40	BW	ASTM A106 Grade B (SMLS) BE	
	12 to 16	STD	BW	ASTM A106 Grade B (SMLS) BE	

Components:	ITEM	NPS	RATING	END CONNECTIONS	DESCRIPTION	NOTES
	INSERT BLINDS	¼ to 16	Class 150	RF	ASTM A105/NA516 Grade 70	14
	BLIND FLANGE	¼ to 16	Class 150	RF	ASTM A105N	
	BOLTING (Nuts)				ASTM A194 Grade 2H	18
	BOLTING (Studs)				ASTM A193 Grade B7	19
	BUSHING	¼ to 1½	Class 3000	Scrd	ASTM A105N	3, 6, 7, 31
	CAP	¼ to 1½	Class 3000	Scrd/SW	ASTM A105N	3, 7, 31
	CAP	2 to 16	Match Pipe	BW	ASTM A234 Grade WPB	8
	COUPLING , Full and Half	¼ to 1½	Class 3000	Scrd/SW	ASTM A105N	3, 7, 31
	CROSS	¼ to 1½	Class 3000	Scrd/SW	ASTM A105N	3, 7, 31
	ELBOW , 45° & 90°, Long Radius	¼ to 1½	Class 3000	Scrd/SW	ASTM A105N	3, 7, 31
	ELBOW, 45° & 90° Straight & Reducing, Long Radius	2 to 16	Match Pipe	BW	ASTM A234 Grade WPB	8, 9
	ELBOLET	¼ to 1½	Class 3000	Scrd/SW	ASTM A105N	3, 7, 31
	FLANGE	¼ to 1½	Class 150	Scrd/SW	ASTM A105N	10
	FLANGE	2 to 16	Class 150	RFWN	ASTM A105N	10
	GASKETS	¼ to 16	Class 150	RF	Spiral wound 304 SS, flexible graphite filler	15
	NIPPLES (min length 100 mm)	¼ to 1½	Sch 80 (XS)	Scrd or PE	ASTM A106 Grade B SMLS	3
	ORIFICE FLANGES	2 to 12	Class 300	RF	ASTM A105N, bored to suite c/w 1/2 in taps and jack bolts	16
	PLUGS (Hex Head)	¼ to 1½	Class 3000	Scrd	ASTM A105N	3, 7, 31
	REDUCERS (Concentric & Eccentric)	2 to 16	STD	BW	ASTM A 234 Grade WPB	8
	RETURN (Long Radius)	2 to 16	STD	BW	ASTM A 234 Grade WPB	8
	SOCKOLET	¼ to 1½	Class 3000	SW	ASTM A105N	3, 11, 31
	SWAGE	¼ to 2	Class 3000	Scrd or PE	ASTM A105N or ASTM A234 WPB	3, 12, 30, 31
	TEE (Straight & Reducing)	¼ to 1½	Class 3000	Scrd/SW	ASTM A105N	3, 7, 31
	TEE (Straight & Reducing)	2 to 16	Std	BW	ASTM A 234 Grade WPB	8
	THREADOLET	¼ to 1½	Class 3000	Scrd	ASTM A105N	3, 11, 31
	TUBING	¼ to ½ (OD)	0.035 in wall	Tube/Scrd	A179 Electrogalv. CS or A269 Gr316 SS with 316SS compression fittings	17
	UNION	¼ to 1½	Class 3000	Scrd/SW	ASTM A105N	3, 13, 31
	WELDOLET	2 to 8	STD	BW	ASTM A105N	11



Revision 4	May 1, 2015
PR-ES-01 Piping Class	A
CLASS:	150
RATING:	ASME/ANSI B16.5

SERVICE:	Hydrocarbon, unprocessed produced fluids, produced water, slop, fuel gas, flare, drain, glycol/water		
Design Code	ASME B31.3 – (2014)		
Design Pressure:	1 960 kPag (285 psig) @ 38°C (100°F). Design pressure derates with temperature per ratings of ASME B16.5	Note 1	
Design Temperature:	-29 to 350°C (-20 to 650°F)	Note 2, 56	
Corrosion Allowance:	1.6 mm (0.0625 in)	Hydrotest Pressure:	2940 kPag (428 psig)
Inspection Requirements:	Random 10% RT	PWHT:	wt > 19 mm (¾")

Valves:	ITEM	NPS	RATING	END CONNECTIONS	DESCRIPTION	NOTES
	BALL	¼ to 1½	Class 2000	Scrd/SW	A105N / A216 WCB body, plated trim	3, 20, 21, 23, 56
	BALL	2 to 16	Class 150	RF	A105N / A216 WCB body, plated trim	20, 22, 23, 56
	CHECK	¼ to 1½	Class 800	Scrd/SW	A105N / A216 WCB body, Integral/Buna trim	23, 24, 56
	CHECK	2 to 16	Class 150	RF	A105N / A216 WCB body, Integral/Buna trim	23, 24, 56
	GATE	¼ to 1½	Class 800	Scrd/SW	A105N / A216 WCB body, F6 / HF trim	23, 25, 56
	GATE	2 to 16	Class 150	RF	A105N / A216 WCB body, F6 / HF trim	23, 26, 56
	GLOBE	¼ to 1½	Class 800	Scrd/SW	A105N / A216 WCB body, F6 / HF trim	23, 25, 56
	GLOBE	2 to 16	Class 150	RF	A105N / A216 WCB body, F6 / HF trim	23, 25, 56
	BUTTERFLY	2 to 16	Class 150	RF	A105N / A216 WCB body	32, 56
	NEEDLE	½ to ¾	Class 3000	Scrd/SW	A105 body, 316 SS trim	27, 56
NOTES:	NOTE #	DESCRIPTION				
	1	Design Pressures based on B16.5 Table 2-1.1. Table values not direct conversion from Metric to Imperial				
	2	Temperature deration above 38°C based on B16.5 Table 2-1-1 or valve design limitation				
	3	Piping smaller than NPS 1 increased to Pipe Schedule XXS in vibrating service. Design engineer to calculate all mechanical loads. Consideration must be given to potential fatigue in vibrating service.				
	4	Glycol piping must be socket welded.				
	5	Thread Sealant Jet-Lube TF-15 or equal. For fuel gas systems at less than 15 psi, use Jetlube V-2 or alterate ULC-S642 approved.				
	6	Bushings not permitted under cyclic service (pressure and/or temperature), vibrating service (i.e. near rotating equipment), or corrosive service. Busing size must be less than 2 to 1 in size ratio. Major dimension must not exceed 1-1/2" NPS.				
	7	Forged steel fitting must meet the requirements of ASME B16.11.				
	8	Buttwelding fitting must meet the requirements of ASME B16.9.				
	9	Short radius elbow and returns shall not be used unless they satisfy the specification of the pipe and pressure rating restrictions imposed by ASME B16.28, Para. 2 (derated to 80% max. allowable stress value).				
	10	ID of pipe bored to match pipe ID. Alteration of fitting must be performed by a fabricator with authorization to modify registered fitting.				
	11	Forged branch outlet fittings must meet the requirements of MSS SP-97. Must specify both run pipe and schedule, and branch pipe and schedule with order as fitting must be sized to provide adequate reinforcement on the run pipe, as well as match wall of branch pipe.				
	12	Swage nipples must meet the requirements of MSS SP-95. Bore and connections must meet the pipe requirements.				
	13	Steel Unions must meet the requirements of MSS SP-83. Consideration must be given to grounding connection.				
	14	Blinds must meet the requirements of ASME B16.48.				
	15	Gasket must meet the requirements of ASME B16.20. Filler must meet the requirements for temperature and pressure.				
	16	Orifice Flanges must meet the requirements of ASME B16.36. For applications on pipe larger than NPS 12, pressure taps shall be installed in piping a distance 1D upstream and 0.5D downstream of the orifice plate.				
	17	Compression fitting components from different manufacturers must not be interchanged. Compression fitting valves must meet or exceed the pressure requirement and materials of construction of all valves listed in piping class.				
	18	Two nuts required per stud.				
	19	Studs must be lubricated with a molybdenum based lubricant prior to assembly.				
	20	Design Engineer to select and or specify full port vs. reduced port, trunnion mount vs. floating ball, length pattern. All actuated valves shall be trunnion mounted.				
	21	Valve may be constructed of bolted body or threaded body.				
	22	Valve must not be one piece welded body.				
	23	All valves shall conform to: ASME B16.34, API 600, and API 607 for ASME B31.3 code piping.				
	24	Design Engineer to specify check valve type and any additional required design details.				
	25	OS & Y, bolted bonnet, Design Engineer to specify full or reduced port.				
	26	OS & Y, Design Engineer to specify full or reduced port.				
	27	Screwed Bonnet, locked				
	30	Swages must match end connection and wall thickness or schedule to matching piping dimension				
	31	Threaded fittings Class 2000 acceptable				
	32	Design Engineer to select seat material based on service				
	56	All components must be reviewed for suitability to operate above 149C. Parts made of elastomers may not be suitable for temperatures above 149C. Metal seated valves may be required above 149C. Design engineer to confirm suitability.				



Revision 4	May 1, 2015
PR-ES-01 Piping Class	AL
CLASS:	150
RATING:	ASME/ANSI B16.5

SERVICE:	LOW TEMP - Hydrocarbon, unprocessed produced fluids, produced water, slop, fuel gas, flare, drain, glycol/water		
Design Code	ASME B31.3 – (2014)		
Design Pressure:	1 960 kPag (285 psig) @ 38°C (100°F). Design pressure derates with temperature per ratings of ASME B16.5	Note 1	
Design Temperature:	-45 to 350°C (-50 to 650°F)	Note 2, 56	
Corrosion Allowance:	1.6 mm (0.0625 in)	Hydrotest Pressure:	2940 kPag (428 psig)
Inspection Requirements:	Random 10% RT	PWHT:	wt > 19 mm (¾")

PIPE:	NPS	WALL THICKNESS	END CONNECTIONS	DESCRIPTION	NOTES
	¼ to 1½	Sch 80 (XS)	Scrd/SW	ASTM A333 Grade 6 (SMLS) PE	3, 4, 5
	2 to 10	Sch 40	BW	ASTM A333 Grade 6 (SMLS) BE	
	12 to 16	STD	BW	ASTM A333 Grade 6 (SMLS) BE	

Components:	ITEM	NPS	RATING	END CONNECTIONS	DESCRIPTION	NOTES
	INSERT BLINDS	¼ to 16	Class 150	RF	ASTM A350 LF2 Cl. 1/A516 Grade 70N	14, 33
	BLIND FLANGE	¼ to 16	Class 150	RF	ASTM A350 LF2 Cl. 1	
	BOLTING (Nuts)				ASTM A194 Grade 2HM	18
	BOLTING (Studs)				ASTM A193 Grade B7M	19
	BUSHING	¼ to 1½	Class 3000	Scrd	ASTM A350 LF2 Cl. 1	3, 6, 7, 31
	CAP	¼ to 1½	Class 3000	Scrd/SW	ASTM A350 LF2 Cl. 1	3, 7, 31
	CAP	2 to 16	Match Pipe	BW	ASTM A420 Grade WPL6	8
	COUPLING, Full and Half	¼ to 1½	Class 3000	Scrd/SW	ASTM A350 LF2 Cl. 1	3, 7, 31
	CROSS	¼ to 1½	Class 3000	Scrd/SW	ASTM A350 LF2 Cl. 1	3, 7, 31
	ELBOW, 45° & 90°, Long Radius	¼ to 1½	Class 3000	Scrd/SW	ASTM A350 LF2 Cl. 1	3, 7, 31
	ELBOW, 45° & 90° Straight & Reducing, Long Radius	2 to 16	Match Pipe	BW	ASTM A420 Grade WPL6	8, 9
	ELBOLET	¼ to 1½	Class 3000	Scrd/SW	ASTM A350 LF2 Cl. 1	3, 7, 31
	FLANGE	¼ to 1½	Class 150	Scrd/SW	ASTM A350 LF2 Cl. 1	10
	FLANGE	2 to 16	Class 150	RFWN	ASTM A350 LF2 Cl. 1	10
	GASKETS	¼ to 16	Class 150	RF	Spiral wound 304 SS, flexible graphite filler	15
	NIPPLES (min length 100 mm)	¼ to 1½	Sch 80 (XS)	Scrd or PE	ASTM A333 Grade 6 (SMLS)	3
	ORIFICE FLANGES	2 to 12	Class 300	RF	ASTM A350 LF2 Cl. 1, bored to suite c/w ½ in taps and jack bolts	16
	PLUGS (Hex Head)	¼ to 1½	Class 3000	Scrd	ASTM A350 LF2 Cl. 1	3, 7, 31
	REDUCERS (Concentric & Eccentric)	2 to 16	STD	BW	ASTM A420 Grade WPL6	8
	RETURN (Long Radius)	2 to 16	STD	BW	ASTM A420 Grade WPL6	8
	SOCKOLET	¼ to 1½	Class 3000	SW	ASTM A350 LF2 Cl. 1	3, 11, 31
	SWAGE	¼ to 2	Class 3000	Scrd or PE	ASTM A350 LF2 Cl. 1 or ASTM A420 Grade WPL6	3, 12, 30, 31
	TEE (Straight & Reducing)	¼ to 1½	Class 3000	Scrd/SW	ASTM A350 LF2 Cl. 1	3, 7, 31
	TEE (Straight & Reducing)	2 to 16	Std	BW	ASTM A420 Grade WPL6	8
	THREADOLET	¼ to 1½	Class 3000	Scrd	ASTM A350 LF2 Cl. 1	3, 11, 31
	TUBING	¼ to ½ (OD)	0.035 in wall	Tube/Scrd	A269 Gr316 SS with 316SS compression fittings	17
	UNION	¼ to 1½	Class 3000	Scrd/SW	ASTM A350 LF2 Cl. 1	3, 13, 31
	WELDOLET	2 to 8	STD	BW	ASTM A350 LF2 Cl. 1	11



Revision 4	May 1, 2015
PR-ES-01 Piping Class	AL
CLASS:	150
RATING:	ASME/ANSI B16.5

SERVICE:	LOW TEMP - Hydrocarbon, unprocessed produced fluids, produced water, slop, fuel gas, flare, drain, glycol/water		
Design Code	ASME B31.3 -- (2014)		
Design Pressure:	1 960 kPag (285 psig) @ 38°C (100°F). Design pressure derates with temperature per ratings of ASME B16.5	Note 1	
Design Temperature:	-45 to 350°C (-50 to 650°F)	Note 2, 56	
Corrosion Allowance:	1.6 mm (0.0625 in)	Hydrotest Pressure:	2940 kPag (428 psig)
Inspection Requirements:	Random 10% RT	PWHT:	wt > 19 mm (¾")

Valves:	ITEM	NPS	RATING	END CONNECTIONS	DESCRIPTION	NOTES
	BALL	¾ to 1½	Class 2000	Scrd/SW	A350 LF2 Cl.1 / A352 LCC body, 316 SS trim	3, 20, 21, 23, 56
	BALL	2 to 16	Class 150	RF	A350 LF2 Cl.1 / A352 LCC body, 316 SS trim	20, 22, 23, 56
	CHECK	¾ to 1½	Class 800	Scrd/SW	A350 LF2 Cl.1 / A352 LCC body, Integral/Buna trim	23, 24, 56
	CHECK	2 to 16	Class 150	RF	A350 LF2 Cl.1 / A352 LCC body, Integral/Buna trim	23, 24, 56
	GATE	¾ to 1½	Class 800	Scrd/SW	A350 LF2 Cl.1 / A352 LCC body, F6 / HF trim	23, 25, 56
	GATE	2 to 16	Class 150	RF	A350 LF2 Cl.1 / A352 LCC body, F6 / HF trim	23, 26, 56
	GLOBE	¾ to 1½	Class 800	Scrd/SW	A350 LF2 Cl.1 / A352 LCC body, F6 / HF trim	23, 25, 56
	GLOBE	2 to 16	Class 150	RF	A350 LF2 Cl.1 / A352 LCC body, F6 / HF trim	23, 25, 56
	BUTTERFLY	2 to 16	Class 150	RF	A350 LF2 Cl.1 / A352 LCC body	32, 56
	NEEDLE	¾ to ¾	Class 3000	Scrd	ASTM A182 F316 body, 316 SS trim	27, 56

NOTES:	NOTE #	DESCRIPTION
	1	Design Pressures based on B16.5 Table 2-1.1. Table values not direct conversion from Metric to Imperial
	2	Temperature deration above 38°C based on B16.5 Table 2-1-1 or valve design limitation
	3	Piping smaller than NPS 1 increased to Pipe Schedule XXS in vibrating service. Design engineer to calculate all mechanical loads. Consideration must be given to potential fatigue in vibrating service.
	4	Glycol piping must be socket welded.
	5	Thread Sealant Jet-Lube TF-15 or equal. For fuel gas systems at less than 15 psi, use Jetlube V-2 or alternate ULC-S642 approved.
	6	Bushings not permitted under cyclic service (pressure and/or temperature), vibrating service (i.e. near rotating equipment), or corrosive service. Busing size must be less than 2 to 1 in size ratio. Major dimension must not exceed 1-1/2" NPS.
	7	Forged steel fitting must meet the requirements of ASME B16.11.
	8	Buttwelding fitting must meet the requirements of ASME B16.9.
	9	Short radius elbow and returns shall not be used unless they satisfy the specification of the pipe and pressure rating restrictions imposed by ASME B16.28, Para. 2 (derated to 80% max. allowable stress value).
	10	ID of pipe bored to match pipe ID. Alteration of fitting must be performed by a fabricator with authorization to modify registered fitting.
	11	Forged branch outlet fittings must meet the requirements of MSS SP-97. Must specify both run pipe and schedule, and branch pipe and schedule with order as fitting must be sized to provide adequate reinforcement on the run pipe, as well as match wall of branch pipe.
	12	Swage nipples must meet the requirements of MSS SP-95. Bore and connections must meet the pipe requirements.
	13	Steel Unions must meet the requirements of MSS SP-83. Consideration must be given to grounding connection.
	14	Blinds must meet the requirements of ASME B16.48.
	15	Gasket must meet the requirements of ASME B16.20. Filler must meet the requirements for temperature and pressure.
	16	Orifice Flanges must meet the requirements of ASME B16.36. For applications on pipe larger than NPS 12, pressure taps shall be installed in piping a distance 1D upstream and 0.5D downstream of the orifice plate.
	17	Compression fitting components from different manufacturers must not be interchanged. Compression fitting valves must meet or exceed the pressure requirement and materials of construction of all valves listed in piping class.
	18	Two nuts required per stud.
	19	Studs must be lubricated with a molybdenum based lubricant prior to assembly.
	20	Design Engineer to select and or specify full port vs. reduced port, trunnion mount vs. floating ball, length pattern. All actuated valves shall be trunnion mounted.
	21	Valve may be constructed of bolted body or threaded body.
	22	Valve must not be one piece welded body.
	23	All valves shall conform to: ASME B16.34, API 600, and API 607 for ASME B31.3 code piping.
	24	Design Engineer to specify check valve type and any additional required design details.
	25	OS & Y, bolted bonnet, Design Engineer to specify full or reduced port.
	26	OS & Y, Design Engineer to specify full or reduced port.
	27	Screwed Bonnet, locked
	30	Swages must match end connection and wall thickness or schedule to matching piping dimension
	31	Threaded fittings Class 2000 acceptable
	32	Design Engineer to select seat material based on service
	33	ASTM A 516 Grade 70N Mateial must be impact tested for low temperature service
	56	All components must be reviewed for suitability to operate above 149C. Parts made of elastomers may not be suitable for temperatures above 149C. Metal seated valves may be required above 149C. Design engineer to confirm suitability.