

**GENERAL NOTES:**

1. ALL ELEVATIONS ARE FROM TOP OF SKID FLOOR.
2. MAIN PIPING PLAN TO BE READ IN CONJUNCTION WITH MECHANICAL FLOW DIAGRAM.
3. ALL BUTTWELD PIPING TO BE BUILT IN ACCORDANCE WITH THE LATEST EDITION OF B31.3 PRESSURE PIPING CODE.
4. ALL BUTTWELD 0.0625" C.A. PIPING TO BE:
  - 150# ANSI: 3" & LARGER - SCH 40
  - 150# ANSI: 2" & SMALLER - SCH 80
 MATERIALS: PIPING - SA-106B SML's  
 FLANGES - SA-105N  
 FITTINGS - SA-234-WPB  
 BOLTS - SA-193-B7  
 NUTS - SA-194-2H  
 GASKET - 304 SS FLEXITALLIC
5. ALL TOL/EOL FITTINGS TO BE:
  - 6000# - 1/2" AND SMALLER
  - 3000# - 3/4" AND LARGER
6. ALL BUTTWELD PIPING TO BE HYDROTESTED TO 1.5 TIMES OF DESIGN PRESSURE.
7. ALL TUBING TO BE 3/8" DIA. ELECTROGALVANIZED c/w CADMIUM PLATED SWAGelok TUBE FITTINGS.
8. ALL INSTRUMENT GAS THREADED PIPING TO BE LEAK TESTED TO 800 KPa.
9. ALL OPENINGS TO BE COVERED PRIOR TO SHIPMENT.
10. UNIT TO BE COMMERCIALY SANDBLASTED TO SSPC-SP6 PRIOR TO:
  - (1) SHOP COAT OF ZINC RICH PRIMER
  - (2) SHOP COAT OF INDUSTRIAL ENAMEL FINISH COAT FOR UNINSULATED SURFACES
 HEATER : INSULATED  
 SKID FLOOR : RUSHTON GREY  
 PIPING : RUSHTON GREY
11. SHIPPING DIMENSIONS : 9'-0" x 34'-0" x 12'-0" HIGH  
 WEIGHT : 19,000 LBS.

**BUILDING NOTES:**

- SIZE & TYPE: 8' x 10' x 8'-0" to 8'-6" SHED ROOF  
 EXTERIOR: 22 GA. GALVANIZED  
 INTERIOR: 24 GA. FLUTED ALUMINUM c/w 6.0 MIL VAPOUR BARRIER  
 INSULATION: R12 (ROOF & WALL)  
 DOORS: (1) 6' x 7' DOUBLE STEEL DOOR c/w PANIC HARDWARE, LOCK-SET, 20" x 20" IWG WINDOW, CHECKCHAIN & WEATHERSTRIPPING.  
 WINDOW: (1) 38" x 36" DOUBLE GLAZED SLIDING c/w SCREEN  
 VENTILATION: (2) 12" x 12" LOUVRES c/w SLIDE & SCREEN  
 OTHER: BLDG DRAWING TO BE P.ENG STAMPED FOR B.C.  
 DOORS RAISED 2" FOR DRIP LIP.

( 2 ) REQ'D

TIME CARD

C-3168-PP

DWG. NO.	REFERENCE DRAWINGS	REV	DESCRIPTION	DATE	BY
		△	REVISED TAG NUMBERS AS PER CUSTOMER REQUIREMENTS.	04/08/10	Y.P.
		△	REVISED LAYOUT, ADDED 1" THK INSULATION ON PIPING.	04/15/10	Y.P.



CUSTOMER: CANADIAN FOREST OIL LTD.		LOCATION: d-55A 93-1-9	
c/o BUCCANEER PROJECTS LTD.		& 8-33-63-12 W5M NARROWAY SITE	
<b>MAIN PIPING PLAN</b>			
1.5MM BTU/HR HEAT MEDIUM SKID PACAKGE			
DATE: 04/05/10	DRN BY: Y.P.	SCALE: 1":1'-0"	CHKD BY: APPRD BY: DWG NO: C-3168-C REV: 2

P-930A/B  
GLYCOL PUMPS

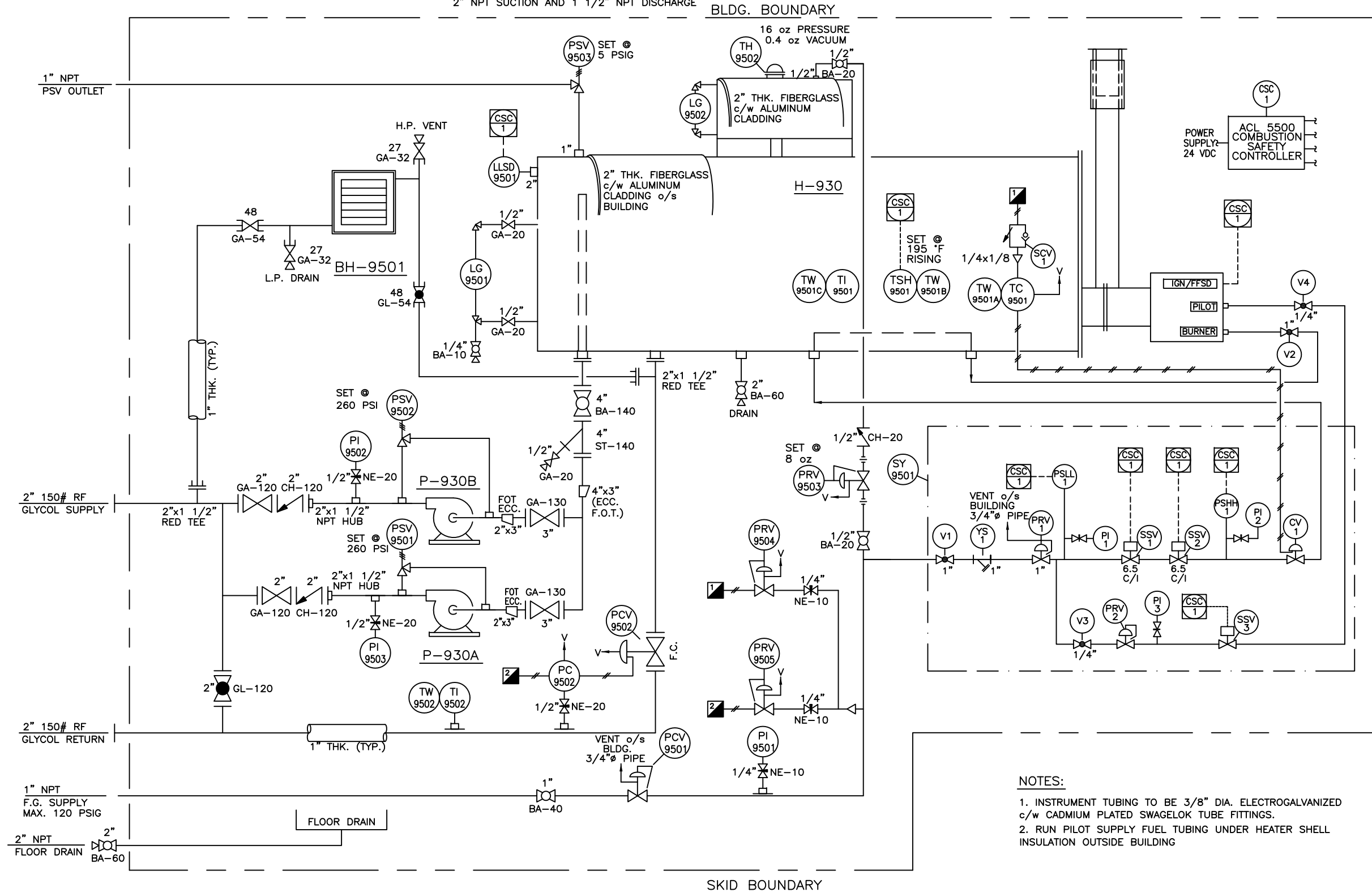
VIKING CENTRIFUGAL PUMP, MODEL 540 1-1.5  
2" NPT SUCTION, 1 1/2" NPT OUTLET c/w 7.5 HP,  
3/60/230/460 VAC, X.P. ELECTRIC MOTOR,  
90 USGPM AT 60 PSIG DISCHARGE PRESSURE  
2" NPT SUCTION AND 1 1/2" NPT DISCHARGE

H-930  
HEAT MEDIUM HEATER

48" OD x 19'-8 1/2" LG (1.5mm BTU/HR)

BH-9501  
BUILDING HEATER

RUFFNECK AH-16A-A3A1-A1-2A  
FINTUBE HEAT EXCHANGER HEATER  
c/w 115V 1 PH 60 Hz EXPLOSION  
PROOF ELECTRIC MOTOR



- NOTES:
1. INSTRUMENT TUBING TO BE 3/8" DIA. ELECTROGALVANIZED c/w CADMIUM PLATED SWAGelok TUBE FITTINGS.
  2. RUN PILOT SUPPLY FUEL TUBING UNDER HEATER SHELL INSULATION OUTSIDE BUILDING

DWG. NO.	REFERENCE DRAWINGS	REV	DESCRIPTION	DATE	BY
		1	REVISED TAG NUMBERS AS PER CUSTOMER REQUIREMENTS.	04/08/10	O.L.
		2	ADDED 1" THK INSULATION ON PIPING.	04/12/10	Y.P.
		3	REVISED AS PER BUILT	05/10/10	Y.P.



CUSTOMER:	CANADIAN FOREST OIL LTD.	LOCATION:	d-55A 93-1-9
	c/o BUCCANEER PROJECTS LTD.		& 8-33-63-12 W5M NARROWAY SITE
<b>MECHANICAL FLOW DIAGRAM</b>			
1.5 MM BTU/HR HEAT MEDIUM PKG			
DATE:	DRN BY:	SCALE:	CHKD BY:
04/05/10	Y.P.	NTS	
APPRD BY:	DWG NO:	REV:	
	C-3168-B1	3	

( 2 ) REQ'D  
TIME CARD  
C-3168-PP

2331-121 Avenue NE  
Edmonton, AB  
T6S 1B2



Ph: (780) 475-8801  
Fx: (780) 475-8892  
[www.rushton.ca](http://www.rushton.ca)

## INSPECTION REPORT

**CUSTOMER:** Canadian Forest Oil Ltd.      **Q.C. INSPECTOR** DION GEMMELL

**RUSHTON JOB #** C 3168 B      **3<sup>RD</sup> PARTY INSP.** \_\_\_\_\_

\* THIRD PARTY INSPECTOR SHALL SIGN IN AND OUT ON DAILY VISITS AND LIAISON WITH RUSHTON'S QUALITY CONTROL PERSONNEL. INSPECTION DONE BETWEEN HOLD POINTS IS FOR SCHEDULING PURPOSES ONLY. INSPECTORS WILL BE NOTIFIED PRIOR TO HOLD POINTS. PLEASE RESERVE REPORTING OF NON-CONFORMANCES UNTIL AFTER HOLD POINTS.

LINE HEATER / SEPARATOR UNIT INSPECTION HOLD POINTS	INITIAL	DATE	A C C	R E J
1. VISUAL INSPECTION OF SKID PRIOR TO FOAMING (IF ANY) OR SETTING EQUIPMENT.	✓	APR 30-10	✓	
2. RADIOGRAPHY & VISUAL INSPECTION PRIOR TO STRESS RELIEVE (IF ANY): FIRE TUBE, BUTT WELD PIPING	✓	APR 28-10	✓	
3. HYDRO-TEST: HEATER COIL, PIPING, FUEL GAS COILS, SEPARATOR	✓	APR 28-10	✓	
4. OTHER NDE REQUIREMENTS.				
5. LINE HEATER INTERNALS / EXTERNALS PRIOR TO END FLANGE BOLT-UP.	✓	APR 29-10	✓	
6. STANDING WATER LEAK TEST: HEATER SHELL	✓	MAY 11-10	✓	
7. TOTAL ASSEMBLY PRIOR SANDBLAST / PAINT.	✓	MAY 11-10	✓	
8. FUNCTION TEST AFTER PACKAGE COMPLETION. AIR / SOAP TEST	✓	MAY 11-10	✓	
9. COMPLETED UNIT: SHIPPING RELEASE CERTIFICATE / DEFICIENCY LIST	D	May 19/10	✓	
10. ALL PRESSURE VESSEL/PIPING/COIL BUNDLE MTR'S VERIFIED	D	April 2/10	✓	
11. OTHER 3 <sup>RD</sup> PARTY INSPECTORS HOLD POINTS				



# RUSHTON GAS & OIL EQUIPMENT (1991) LTD.

EXHIBIT #21a

PRE PRESSURE TEST PIPING CHECK LIST JOB # **C-3168** UNIT **B**

Check list to be completed before hydro testing and returned to QC office.

	N/A	CHECKED
1. Pipe Material; schedule and specification correct.		/
2. Flanges; ratings, schedule and material specification correct.		/
3. Fittings; tees, return bends, reducers, couplings and weld-o-lets etc. Correct schedule and material specification.		/
4. Valves; identification - Manufacturer's name tag, etc., correct.		/
5. Valves; installed correctly, flow direction, accesses, rising stems free from obstructions, clearance for removal adequate.		/
6. Lubrication fittings, drains, etc., installed as required.		/
7. Bolts, Studs, Nuts, Diameter; length and material correct, Studs minimum 1 thread projecting from nut (check piping notes for customer spec)		/
8. Gaskets are correct type, material, size, etc.		/
9. All welding satisfactory and traceable to Welder's symbol.		/
10. Seal welding complete - threads covered.	/	
11. All attachment welds satisfactory.		/
12. All skid edge connections square / level to skid.		/
13. All skid edge flange connections to be two holed.		/
14. U bolts tightened.		/
15. Flange connections tightened.		/
16. Heater / Vessel bolt down tightened.		/
17. All contactor base plate bolts installed.	/	
18. All valve handles checked for operation.		/

Print Name: D. TROMAN

Signature: 

Date: APR 29-10

# RUSHTON GAS & OIL EQUIPMENT (1991) LTD.

EXHIBIT #21b

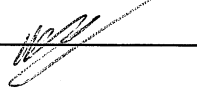
JOB # **C-3168** UNIT **B**

## PRE / POST PRESSURE TEST CHECK LIST

Check list to be completed and returned to QC office.

	N/A	CHECKED
<b>PRESSURE TEST PREPARATION</b>		
1. Test gauges to be within correct range.		/
2. Test blinds correct thickness.		/
3. All items which could be damaged by test isolated or removed (control valves, safety valves, instruments, expansion joints, etc.).		/
4. Equipment with internals (i.e. filters) that could be damaged, isolated as required.		/
5. Vents and drains correctly installed.		/
6. Open and Closed position of all valves verified.		/
7. Test pressure's checked against Test pressures in piping notes on lay out drawing and spec. break locations as shown on mechanical flow sheet.		/
<b>PRESSURE TEST COMPLETION</b>		
1. All temporary blinds (blanks) removed.		/
2. Temporary gaskets changed for correct gaskets.		/
3. Temporary hydro plugs broke loose.		/
4. Unit taped for sand blasting.		/
5. Unit drained and glycol added to all low points.		/

Print Name: D. T ROMAN

Signature : 

Date: APR 29-10



# CONSTRUCTION DATA REPORT FOR PIPING SYSTEMS

In accordance with the provisions of the Safety Codes Act

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: Rushton Gas & Oil Equipment (1991) Ltd. Owner's Job No: \_\_\_\_\_  
(Name of ABSA authorized primary contractor or subcontractor)  
2331-121 Ave NE Edmonton, Alberta T6S 1B2  
(Address)  
 Alberta Quality Program No. AQP-1150 Expiry Date: January 20, 2012

2. Constructed For: \_\_\_\_\_  
(Name of primary contractor if different from above)  
 \_\_\_\_\_  
(Address)  
 Alberta Quality Program No. AQP- Expiry Date: \_\_\_\_\_  
(Required when the primary contractor undertakes some/all of the quality functions, e.g., Mat'l supply, NDE, PWHT, Tie-in, fabrication, hydro test, final assembly etc.)

3. Owner: Canadian Forest Oil Ltd. Suite 2500, 645-7th Avenue SW Calgary, AB T2P 4G8  
(Name and address)  
LSD: 8-33-63-12 W5M  
(Location of installation)  
 Alberta Quality Program No. AQP- Expiry Date: \_\_\_\_\_  
(Required when the owner undertakes some/all of the quality functions, e.g., Mat'l supply, NDE, PWHT, Tie-in, fabrication, hydro test, final assembly etc.)

4. Piping Design Alberta Registration No.: PP-  
(Required if aggregate piping volume is over 0.5m<sup>3</sup>)  
 5. WP No.: WP-1019.2 ; Company: Rushton Gas & Oil (1991) Ltd. ; Owner's WP No. (If used): WP-  
(Alberta Registration No.) (Alberta Registration No.)  
 WPS No(s). used: R-1 ; Owner's WPS No(s). (If used): \_\_\_\_\_

6. Code: ASME B31.1 Non Boiler External Piping ; ASME B31.1 Boiler External Piping ;  
 ASME B31.3  - Service category: Normal , D , M , High Pressure ; B31.5 ; B31.9 .

Drawing No. Rev. No. Line No.	Fluid (Air/Stm. Etc.)	Des. Press. kPa	Des. Temp. °C	Test Press. kPa	Test Medium	Pipe Mat'l Spec. & Grade	C.A. mm	Pipe NPS & Schedule	Flange Material & Rating	PWHT/ Preheat Temp. °C	R.T. %	Other NDE
DWG# C-3168-B1 REV. 2												
DWG# C-3168-C REV. 2												
HM1-60.3(2")-001	GLYCOL	1793	-29/93	2689	WATER	SA-106B	1.5875	2"/1 1/2"/3/4" SCH 80	SA-105N CL 150	-	10% BW	-
HM1-114.3(4")-002	GLYCOL	1793	-29/93	2689	WATER	SA-106B	1.5875	4"/3" SCH 40/2"/1" SCH 80	SA-105N CL 150	-	10% BW	-
HM1-60.3(2")-003	GLYCOL	1793	-29/93	2689	WATER	SA-106B	1.5875	2"/1 1/2"/1"/3/4" SCH 80	SA-105N CL 150	-	10% BW	-
FG1-33.4(1")-004	NATURAL GAS	827	-29/93	1241	WATER	SA-106B	1.5875	1" SCH 80	-	-	THR'D	-

Partial Data Reports, properly identified and certified by ABSA-authorized contractors, as listed below are attached to and form part of this Data Report

No.	Line No.	Spool No.	Drg. No. (with Rev. No.)	Contractor (Name)	AQP No.	Expiry date

**Remarks:** Provide additional comments including noting any code work that was not performed by the ABSA- authorized contractor(s) supplying this document as a Partial Data Report but which must be completed by another ABSA-authorized contractor who assumes overall responsibility for conformance with the Safety Codes Act & Regulations and applicable ASME Codes, and who assures that all required code work is completed prior to putting the piping system into service.

**Endorse certificate 'A' or 'B'**

**A. CERTIFICATE OF COMPLIANCE**

Signed by the subcontractor when supplying this certificate as a Partial Data Report

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).

Date: \_\_\_\_\_  
Subcontractor

\_\_\_\_\_  
Print Authorized Representative's Name                      Signature


**This certificate is not valid unless it forms part of a Final Data Report signed by Primary Contractor**

**B. CERTIFICATE OF COMPLIANCE**

Signed by the primary contractor when supplying this certificate as a Final Data Report

We certify that the statements in this Data Report are correct and that piping job no. C-3168B 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).

Date: MAY 07, 2010 Rushton Gas & Oil  
Primary Contractor

Celso D. Sune, Jr.   
Print Authorized Representative's Name                      Signature

**CERTIFICATE OF INSPECTION**

I, the undersigned, employed by \_\_\_\_\_ have inspected the piping job no. \_\_\_\_\_ described in this Construction Data Report and state that, to the best of my knowledge and belief, the Contractor has constructed this piping in accordance with the applicable Sections of the ASME Piping Codes and Province of Alberta Safety Codes Act and Regulations.

Date: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_  
Print Owner's Inspector's Name      Owner's Inspector's Signature                      Name: \_\_\_\_\_ Sign.: \_\_\_\_\_  
ABSA Safety Codes Officer  
(BOILER EXTERNAL PIPING ONLY)





Farris Pressure Management  
a Division of Spartan Controls

# FARRIS PRESSURE MANAGEMENT

## EDMONTON FACILITY INSPECTION TEST REPORT

<b>CUSTOMER</b>	<b>ORDER#</b>	<b>Farris WO#</b>	<b>Metal Tag:</b>
Rushton Gas & Oil	1345325	1345325-06	PSV-9503
PO: 20534-C3168			
Req#			<b>Sup. Tag:</b>

<b>MODEL:</b>	<b>TYPE:</b>	<b>VALVE SIZE:</b>	<b>ORIFICE</b>	<b>FactorySerial#</b>	<b>CRN#</b>
27DA33-M20/00	2700	1"MNPTx1"FNPT	D	565305-9-KE	0G11969.5C

**SERVICE:**

SERVICE: Gas StampSymbol: UV NB

CAPACITY: 604 SCFM Metric Only: No

Set Pressure	Back Pressure	Diff	Cold Diff	Temp. Corr.	Temperature
260 PSIG	0 PSIG	260 PSIG	260 PSIG	0 PSIG	60 F (16 C)

**MATERIAL/HEAT NUMBER ASSIGNMENT:**

Body: F65 Nozzle: \_\_\_\_\_

Bonnet: E73 Disc: Y71344

**PERFORMANCE TEST DATA:**

TEST FLUID:  Air  Water  Air Over Water

Final Test Pressure: 260 PSIG

Upper B.D.R. Setting: \_\_\_\_\_ Notches

Lower B.D.R. Setting: FIXED Notches

Shop Test Gauges Used: 1. 7A 2. 11A

**BACK PRESSURE TEST:**

Not Applicable, (Open Bonnet / Cap Design)

120 PSIG Air

**SEAT TIGHTNESS TEST: API-527**

TEST FLUID:  Air  Water  Air Over Water

Req'd At:  90%  95% Of Set Pressure

Leak Test Pressure: 234 PSIG

No Visible Leaks:

Leak Rate: 16 B.P.M.

Final Inspection / Tech Tested: Jim

Date Tested: Apr/12/10

**FOR WITNESS TESTING ONLY**

Tested By: \_\_\_\_\_ Date: \_\_\_\_\_

Customer Witness: \_\_\_\_\_ Farris Witness: \_\_\_\_\_



Farris Pressure Management  
a Division of Spartan Controls

# FARRIS PRESSURE MANAGEMENT

## EDMONTON FACILITY INSPECTION TEST REPORT

<b>CUSTOMER</b>	<b>ORDER#</b>	<b>Farris WO#</b>	<b>Metal Tag:</b>
Rushton Gas & Oil	1345325	1345325-05	PSV-9503
PO: 20534-C3168 <b>(B)</b>			
Req#			Sup. Tag:

<b>MODEL:</b>	<b>TYPE:</b>	<b>VALVE SIZE:</b>	<b>ORIFICE</b>	<b>FactorySerial#</b>	<b>CRN#</b>
27DA33-M20/00	2700	1"MNPTx1"FNPT	D	565305-5-KE	0G11969.5C

**SERVICE:**

SERVICE: Gas StampSymbol: UV NB

CAPACITY: 604 SCFM Metric Only: No

Set Pressure	Back Pressure	Diff	Cold Diff	Temp. Corr.	Temperature
260 PSIG	0 PSIG	260 PSIG	260 PSIG	0 PSIG	60 F (16 C)

**MATERIAL/HEAT NUMBER ASSIGNMENT:**

Body: F65 Nozzle: \_\_\_\_\_

Bonnet: E70 Disc: Y71344

**PERFORMANCE TEST DATA:**

TEST FLUID:  Air  Water  Air Over Water

Final Test Pressure: 260 PSIG

Upper B.D.R. Setting: \_\_\_\_\_ Notches

Lower B.D.R. Setting: FIXED Notches

Shop Test Gauges Used: 1. 7A 2. 11A

**BACK PRESSURE TEST:**

Not Applicable, (Open Bonnet / Cap Design)

120 PSIG Air

**SEAT TIGHTNESS TEST: API-527**

TEST FLUID:  Air  Water  Air Over Water

Req'd At:  90%  95% Of Set Pressure

Leak Test Pressure: 234 PSIG \_\_\_\_\_ KPAG

No Visible Leaks:

Leak Rate: 37 B.P.M.

Final Inspection / Tech Tested: Jim

Date Tested: Apr/12/10

**FOR WITNESS TESTING ONLY**

Tested By: \_\_\_\_\_ Date: \_\_\_\_\_

Customer Witness: \_\_\_\_\_ Farris Witness: \_\_\_\_\_



Farris Pressure Management  
a Division of Spartan Controls

# FARRIS PRESSURE MANAGEMENT

## EDMONTON FACILITY INSPECTION TEST REPORT

<b>CUSTOMER</b>	<b>ORDER#</b>	<b>Farris WO#</b>	<b>Metal Tag:</b>
Rushton Gas & Oil	1345325	1345325-02	PSV-9503
PO: 20534-C3168			
Req#			Sup. Tag:

<b>MODEL:</b>	<b>TYPE:</b>	<b>VALVE SIZE:</b>	<b>ORIFICE</b>	<b>FactorySerial#</b>	<b>CRN#</b>
27DA33-M20/00	2700	1"MNPTx1"FNPT	D	549863-2-KE	0G11969.5C

**SERVICE:**

SERVICE: Gas StampSymbol: Non Code

CAPACITY: 45 SCFM Metric Only: No

<u>Set Pressure</u>	<u>Back Pressure</u>	<u>Diff</u>	<u>Cold Diff</u>	<u>Temp. Corr.</u>	<u>Temperature</u>
5 PSIG	0 PSIG	5 PSIG	5 PSIG	0 PSIG	60 F (16 C)

**MATERIAL/HEAT NUMBER ASSIGNMENT:**

Body F64 Nozzle

Bonnet E53 Disc Y71344

**PERFORMANCE TEST DATA:**

TEST FLUID  Air  Water  Air Over Water

Final Test Pressure 5 PSIG

Upper B.D.R. Setting: Notches

Lower B.D.R. Setting: FIXED Notches

Shop Test Gauges Used: 1. IB 2. IIA

**BACK PRESSURE TEST:**

Not Applicable, (Open Bonnet / Cap Design)

5 PSIG Air

**SEAT TIGHTNESS TEST: API-527**

TEST FLUID  Air  Water  Air Over Water

Req'd At 90%

Leak Test Pressure 4 PSIG

No Visible Leaks

Leak Rate 0 B.P.M.

Final Inspection / Tech Tested Jim

Date Tested Apr 22/10

**FOR WITNESS TESTING ONLY**

Tested By: \_\_\_\_\_ Date: \_\_\_\_\_

Customer Witness: \_\_\_\_\_ Farris Witness: \_\_\_\_\_

# ACL Manufacturing Inc

## ACL Valve Train Checklist

PO Number: 1440  
 Customer: ZIRCO  
 Location:

Date 04/22/10

	X
Drawings Issued	X
Stamped Drawings and Burner label issued	—
Tag Applied	X
Regulator orifice size	1/2"
Valve #1 orifice size	1"
Valve #2 orifice size	1"
Socket plug in pilot solenoid vent port	X
Pressure Drop Across Valve Train	2psi
Valve Train Tested & Leak Checked	X
1/4 Valve as per B149.3	X
Technician: <i>AP</i>	

Valve Train  
 Description Voltage Month Day Year Orientation  
 E, EP, P, T 12,24,120 LR, RL

Serial # ACL-1-EP-24-042210-RL-01

### Liability Statement

ACL Manufacturing Inc. shall not be liable for any special, indirect, consequential or other damages of a like general nature, including, without limitation, loss of profits or production, or loss or expenses of any nature incurred by the buyer or any third party.

### Limited Warranty

Seller warrants that the product hereby purchased is, upon delivery, free from defects in material and workmanship and that any such product which is found to be defective in such workmanship or material will be repaired or replaced by Seller for a period of one year from purchase date. Warranty of such items do not include shipping, installation, service or set-up.



# Sandvik Materials Technology Canada Tube Production Unit

09/02/26 7:40:46  
Page - 2

425 McCartney Street  
Arnprior, Ontario, Canada K7S 3P3  
(613) 623-6501 Fax:(613) 623-7243

## Certified Material Test Report

SO: 11248  
MO: 00037318

### Mechanical Tests

Work Order	ASTM E8 0.2% YS test KSI	ASTM E8 ULT test KSI	ASTM E8 %EL 2" test	HARDNESS RB ASTM E18
344491	47	89	52	72 69
344492	46	88	50	69 68
344493	47	91	50	71 69
344494	47	90	52	70 69
344495	49	92	48	73 74
344496	44	88	54	72 69

### Additional Tests

ASTM A450 FLARE - Acceptable

ASTM A450 FLATTENING - Acceptable

Positive Material Identification - Acceptable

Eddy Current Examination - Acceptable.

Seamless, Cold Finished, Bright Annealed & Quenched

No weld repair has been performed on this material

Traceability is through Work Order number linemarked on tubes

Country of origin: Canada

This material has not come in contact with mercury or mercury-containing compounds

This certification affirms that the contents of the report are correct and accurate and that all test results and operations performed by Sandvik Materials Technology Canada or our subcontractors are in compliance with the material specification

The material is manufactured according to a quality system, approved and registered to ISO 9001:2000 certificate number GBG0000511 which expires November 30, 2010

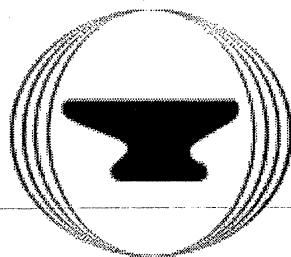
Inspection certificate acceptable to EN 10204 3.1

This certificate is produced electronically and is valid without signature

Quality Assurance: Bonnie Hamilton, Quality Assurance Manager  
Julie Recoskie, Certificate

Revisions 09/02/26





**ANVIL**  
INTERNATIONAL, INC.



Simcoe, Ontario  
Edmonton, Alberta  
Montreal, Quebec

## Certificate of Test

Part Number: 0332623404 Description: 1 X 2 BLK XH SMLS NIP  
Heat Code: FB5687  
Reference No.:  
Part Specification: Y

Starting Material: 0332623404 Description: 1 X 2 BLK XH SMLS NIP  
Specification: ASTM A-106-97a Grade B, ASME SA-106 1992 Edition, A97 Revisi  
ASTM A-53-97 Grade B, ASME SA-53 1997 Edition, A97 Revision  
Fitting Trademark: BECK MANUFACTURING

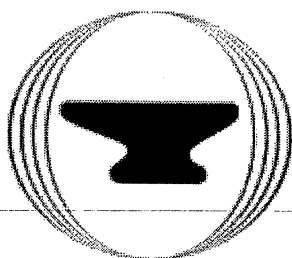
### Chemical Analysis %

Heat No.	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V	Cb/Nb
615413	0.18	0.50	0.020	0.013	0.23	0.04	00.02	00.02	0.01	0.01	

### Mechanical Properties

Yield Strength	Tensile Strength	Elongation % 2	Reduction Area	Hardness BHN
psi 050,000	psi 074,000	000034		
MPa 000	MPa 000			
Heat Treatment:				
GOOD				

We certify that this is a true and correct copy of the mill certificate, issued by the manufacturer of the steel employed or the laboratory which has determined it, as retained in the records of the company. We make no representation beyond those of the manufacturer or its agent.



**ANVIL**  
INTERNATIONAL, INC.



Simcoe, Ontario  
Edmonton, Alberta  
Montreal, Quebec

## Certificate of Test

Part Number: 0332623404 Description: 1 X 2 BLK XH SMLS NIP  
Heat Code: FB5711  
Reference No.:  
Part Specification: Y

Starting Material: 0332623404 Description: 1 X 2 BLK XH SMLS NIP  
Specification: ASTM A-106-97a Grade B, ASME SA-106 1992 Edition, A97 Revisi  
ASTM A-53-97 Grade B, ASME SA-53 1997 Edition, A97 Revision  
Fitting Trademark: BECK MANUFACTURING

### Chemical Analysis %

Heat No.	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V	Cb/Nb
Y0705301	0.19	0.56	0.020	0.008	0.20	0.01	00.01	00.02	0.00	0.00	

### Mechanical Properties

Yield Strength	Tensile Strength	Elongation % 2	Reduction Area	Hardness BHN
psi 045,685	psi 071,790	000029		
MPa 000	MPa 000			
Heat Treatment:				
2500		GOOD		

We certify that this is a true and correct copy of the mill certificate, issued by the manufacturer of the steel employed or the laboratory which has determined it, as retained in the records of the company. We make no representation beyond those of the manufacturer or its agent.





P.O. Box 40, Simcoe, Ontario N3Y 4K9  
 Tel. (519) 426-4551 Fax (519) 426-5509

## Certificate of Test

Part Number: Y3104 Description: 1x4 B XS SML NIP 106B  
 Heat Code: AI92  
 Reference No.:  
 Specification: ASTM A106-04 GRADE B/ ASME SA106 GRADE B  
 Fitting Trademark: NIKOPOL

### Chemical Analysis %

Heat No.	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V	Cb/Nb
621146	0.21	0.51	0.016	0.023	0.24	0.03	0.02	0.02	0.01	<0.01	
CE (LONG FORMULA) = 0.31											

### Mechanical Properties

Yield Strength PSI : 48,700 MPa : 000 Elongation % 2" : 32.00 Heat Treatment: SEAMLESS Hydrotest/NDE: NDE	Tensile Strength PSI : 71,500 MPa: 000 Reduction in Area % : 0.00 Hardness BHN : N/R MAX.HARDNESS DOES NOT EXCEED 22HRC.IN ACC. WITH NACE MR0175 Bend: GOOD
---	--

We certify that this is a true and correct copy of the mill certificate, issued by the manufacturer of the steel employed or the laboratory which has determined it, as retained in the records of the company. CANVIL makes no representation beyond those of the manufacturer or it's agent.



Simcoe, Ontario  
 Edmonton, Alberta  
 Montreal, Quebec

A Division of Mueller Canada, LTD.



P.O. Box 40, Simcoe, Ontario N3Y 4K9  
 Tel. (519) 426-4551 Fax (519) 426-5509

## Certificate of Test

Part Number: F20211 Description: 1/4 2M TD 90 105N  
 Heat Code: 2305  
 Reference No.:  
 Specification: ASTM A105/ASME SA105  
 TO ASTM A 105/A 105M - 03  
 Fitting Trademark: CANVIL

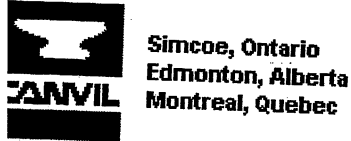
### Chemical Analysis %

Heat No.	<u>C</u>	<u>Mn</u>	<u>P</u>	<u>S</u>	<u>Si</u>	<u>Cu</u>	<u>Ni</u>	<u>Cr</u>	<u>Mo</u>	<u>V</u>	<u>Cb/Nb</u>
378634	0.18	0.85	0.013	0.008	0.22	0.15	0.05	0.07	0.01	<0.01	
CE (LONG FORMULA) = 0.36											

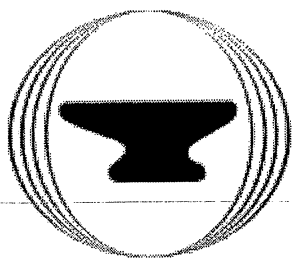
### Mechanical Properties

Yield Strength PSI : 55,400		Tensile Strength PSI : 78,600
MPa : 000		MPa: 000
Elongation % 2" : 28.80	Reduction in Area % : 65.70	Hardness BHN : 143
Heat Treatment: N	NORMALIZED	
*****MEETS SPECS ACCORDING TO EN10204*****		

We certify that this is a true and correct copy of the mill certificate, issued by the manufacturer of the steel employed or the laboratory which has determined it, as retained in the records of the company. CANVIL makes no representation beyond those of the manufacturer or it's agent.



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**ANVIL**  
INTERNATIONAL, INC.

## Certificate of Test

Part Number: 0861024206 Description: 1/4 IMP 2000 FS THRD TEE  
Heat Code: A2396  
Reference No.: 62345  
Part Specification: Y

Starting Material: 0861024206 Description: 1/4 IMP 2000 FS THRD TEE  
Specification: ASTM/ASME A/SA105N-03  
Fitting Trademark:

### Chemical Analysis %

Heat No.	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V	Cb/Nb
382402	0.22	0.86	0.010	0.010	0.20	0.18	0.04	0.06	0.01	< 0.01	< 0.01

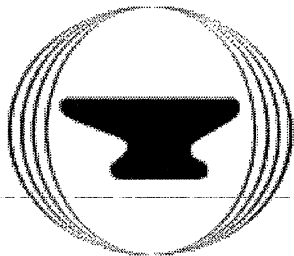
CE (LONG FORMULA) = 0.40

### Mechanical Properties

Yield Strength	Tensile Strength	Elongation % 2	Reduction Area	Hardness BHN
psi 57,600	psi 78,600	30.00	64.90	140
MPa 397	MPa 542			

Heat Treatment: N

We certify that this is a true and correct copy of the mill certificate, issued by the manufacturer of the steel employed or the laboratory which has determined it, as retained in the records of the company. We make no representation beyond those of the manufacturer or its agent.



**ANVIL**  
INTERNATIONAL, INC.



Simcoe, Ontario  
Edmonton, Alberta  
Montreal, Quebec

## Certificate of Test

Part Number: E8447 Description: 1x1/4 FG HX BSH 105  
 Heat Code: H74  
 Reference No.:  
 Specification: ASTM A105/ ASME SA105  
 TO ASTM A105/A 105M - 97  
 Fitting Trademark: ARCELORMITTAL USA

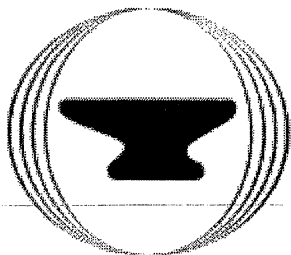
### Chemical Analysis %

Heat No.	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V	Cb/Nb
887098	0.21	0.82	0.007	0.024	0.25	0.08	0.04	0.12	0.01	< 0.01	0.01
CE (LONG FORMULA) = 0.39											

### Mechanical Properties

Yield Strength	Tensile Strength	Elongation % 2	Reduction Area	Hardness BHN
psi 72,000	psi 90,000	22.00	55.00	179
MPa 000	MPa 000			
Heat Treatment:				

We certify that this is a true and correct copy of the mill certificate, issued by the manufacturer of the steel employed or the laboratory which has determined it, as retained in the records of the company. We make no representation beyond those of the manufacturer or its agent.



**ANVIL**  
INTERNATIONAL, INC.



Simcoe, Ontario  
Edmonton, Alberta  
Montreal, Quebec

## Certificate of Test

Part Number: 0332605005 Description: 1/4 X 1-1/2 BLK XH SMLS NIP  
Heat Code: BB5292  
Reference No.:  
Part Specification: Y

Starting Material: 0332605005 Description: 1/4 X 1-1/2 BLK XH SMLS NIP  
Specification: ASTM A-106-97a Grade B, ASME SA-106 1992 Edition, A97 Revisi  
Fitting Trademark: BECK MANUFACTURING

### Chemical Analysis %

<u>Heat No.</u>	<u>C</u>	<u>Mn</u>	<u>P</u>	<u>S</u>	<u>Si</u>	<u>Cu</u>	<u>Ni</u>	<u>Cr</u>	<u>Mo</u>	<u>V</u>	<u>Cb/Nb</u>
706-163	0.20	0.53	0.008	0.006	0.21	0.09	00.06	00.03	0.00	0.00	

### Mechanical Properties

<u>Yield Strength</u>	<u>Tensile Strength</u>	<u>Elongation % 2</u>	<u>Reduction Area</u>	<u>Hardness BHN</u>
psi 043,511	psi 070,343	000032		
MPa 000	MPa 000			
Heat Treatment:				
GOOD				

We certify that this is a true and correct copy of the mill certificate, issued by the manufacturer of the steel employed or the laboratory which has determined it, as retained in the records of the company. We make no representation beyond those of the manufacturer or its agent.





P.O. Box 40, Simcoe, Ontario N3Y 4K9  
 Tel. (519) 426-4551 Fax (519) 426-5509

## Certificate of Test

Part Number: Y3025 Description: 1/4x5 B XS SML NIP 106B  
 Heat Code: AI41  
 Reference No.:  
 Specification: ASTM A106-99 GRADE B/ ASME SA106 GRADE B  
 Fitting Trademark: SILCOTUB SA

### Chemical Analysis %

<u>Heat No.</u>	<u>C</u>	<u>Mn</u>	<u>P</u>	<u>S</u>	<u>Si</u>	<u>Cu</u>	<u>Ni</u>	<u>Cr</u>	<u>Mo</u>	<u>V</u>	<u>Cb/Nb</u>
41465	0.22	0.61	0.008	0.006	0.27	0.07	0.04	0.03	<0.01	<0.01	
CE (LONG FORMULA) = 0.34											

### Mechanical Properties

Yield Strength PSI :47,850	Tensile Strength PSI :69,670
MPa :000	MPa:000
Elongation % 2" : 34.20	Reduction in Area % : 0.00
	Hardness BHN : N/R.
Heat Treatment:	
MEETS NACE MR0175	
HARDNESS LESS TAN OR EQUAL 22HRC	
Hydrotest/NDE: 3000 PSI	Bend: GOOD

We certify that this is a true and correct copy of the mill certificate, issued by the manufacturer of the steel employed or the laboratory which has determined it, as retained in the records of the company. CANVIL makes no representation beyond those of the manufacturer or it's agent.



Simcoe, Ontario  
 Edmonton, Alberta  
 Montreal, Quebec

A Division of Mueller Canada, LTD.



**柏緯鐵工股份有限公司**

高雄縣仁武鄉高林村仁心路 303 號  
**BOTH-WELL STEEL FITTINGS CO., LTD.**

NO.303, JEN-HSIN ROAD JEN-WU HSIANG  
 KAOHSIUNG HSIEN, TAIWAN R.O.C.(81460)

TEL: (07) 871-0497, 871-1586, 872-0260 FAX: (886-7) 871-3864, 371-8882

WEB SITE: <http://www.bothwell.com.tw> E-MAIL: [bothwell@www.bothwell.com.tw](mailto:bothwell@www.bothwell.com.tw) or [box@mail.bothwell.com.tw](mailto:box@mail.bothwell.com.tw)

An ISO-9001 Registered Manufacturer



**MILL TEST OR INSPECTION CERTIFICATE**

ACCORDING TO EN10204/DIN50049/3.1.B

CUSTOMER: WFF FITTING AND FLANGES (CANADA) LTD.,  
 CERT NO: 62647 ORDER NO: CA17890KD

INVOICE NO: BWO69508093  
 L/C NO: 115500706

ORIGIN: TAIWAN  
 DATE: 12/05/06  
 PAGE: 7

ITEM	RAW MATERIAL HEAT NO.	BOTH WELL RT. CD.	DESCRIPTION	QUANTITY	SPECIFICATION: ASTM / ASME A/SA 105N -03 DIMENSION: ASME B16.11 - 2001 SURFACE: BY VISUAL...GOOD
031	386632	2492	HEX PLUG 3/8" NPT 11N002301	500 PC	
032	387353	2519	HEX PLUG 1/2" NPT 11N003301	10000 PC	
033	387353	2519	HEX PLUG 3/4" NPT 11N004301	2000 PC	
034	387353	2519	HEX PLUG 1" NPT 11N005301	5443 PC	
034	388836	2574	HEX PLUG 1" NPT 11N005301	4557 PC	
035	387040	2505	HEX PLUG 2" NPT 11N006301	802 PC	
035	388014	2543	HEX PLUG 2" NPT	4198 PC	

**CHEMICAL COMPOSITION (%)**

ITEM	C	Si	Mn	P	S	Cu	Cr	Ni	Mo	V	Cb(Nb)	N
Min	-	0.100	0.600	-	-	-	-	-	-	-	-	-
Max	0.350	0.350	1.050	0.035	0.040	0.400	0.300	0.400	0.120	0.050	0.020	-
031	0.200	0.190	0.850	0.015	0.006	0.210	0.100	0.060	0.020	0.002	0.000	-
032	0.210	0.180	0.840	0.015	0.011	0.170	0.090	0.050	0.010	0.002	0.004	-
033	0.210	0.180	0.840	0.015	0.011	0.170	0.090	0.050	0.010	0.002	0.004	-
034	0.210	0.180	0.840	0.015	0.011	0.170	0.090	0.050	0.010	0.002	0.004	-
034	0.220	0.210	0.840	0.017	0.006	0.130	0.090	0.070	0.010	0.004	0.001	-
035	0.210	0.190	0.880	0.011	0.008	0.140	0.100	0.060	0.020	0.003	0.005	-
035	0.210	0.210	0.840	0.019	0.017	0.140	0.070	0.040	0.010	0.003	0.003	-

**MECHANICAL TEST**

ITEM	Tensile Strength (KSI)	Yield Strength (KSI)	Elon-Gation (%)	R of A (%)	Hardness (HB)
Min	70.0	36.0	22.0	30.0	-
Max	-	-	-	-	187
031	76.5	58.7	29.4	62.8	142
032	77.3	61.4	30.4	63.2	144
033	77.3	61.4	30.4	63.2	144
034	77.3	61.4	30.4	63.2	144
034	77.5	53.4	34.0	66.7	141
035	77.1	57.4	28.8	62.8	143
035	78.6	63.3	28.2	64.1	144

Remark:  
 NORMALIZED : 850°C  
 CONFORMS TO NACE MR0175-2003  
 STEEL MAKING PROCESS: ELECTRIC FURNACE

WE CERTIFY THE ABOVE MENTIONED FITTINGS HAVE BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH THE SPECIFICATIONS SHOWN

*S. Chen*      *C. Huang*  
 Q.C. MANAGER      INSPECTOR  
 SHENG CHENG LEE      CHUN CHIEH HUANG





# Sandvik Materials Technology Canada Tube Production Unit

09/02/26 7:40:46  
Page - 1

425 McCartney Street  
Arnprior, Ontario, Canada K7S 3P3  
(613) 623-6501 Fax:(613) 623-7243

## Certified Material Test Report

<u>Customer</u>	<u>Ship To</u>	<u>Sales Order</u>	<u>Item Number</u>
SANDVIK MATERIALS TECH. NAFTA 425 MCCARTNEY ST ARNPRIOR, ON K7S 3P3 CANADA	UNIFIED ALLOYS (CALGARY) 1 7408 40TH SE CALGARY, AB T2C 2L6 CANADA	11248	16048
		<u>Mill Order</u>	
		00037318	

<u>Customer Order and Item</u>	<u>Specifications</u>
069049 2	ASTM A213-07a/A269-07a/A511-04 ASME SA213-07 ED EAW CD80INST-R15 NACE MR-0175

Tag  
UNIFIED ALLOYS (CALGARY) CP45740  
CALGARY ALT2C 2L6

Material  
TP316/TP316L MT316/MT316L  
Seamless Stainless Steel Tubing  
3/8" Avg OD X .035" Avg Wall  
9.53 mm Avg OD X .89 mm Avg Wall

<u>Work Order/ Heat No</u>	<u>No Of Pieces</u>	<u>Total Length</u>	<u>UOM</u>	<u>Net Total Weight</u>	<u>UOM</u>
344491 520898	396	7,920.00	FT	464.26	KG
344492 520898	407	8,140.00	FT	477.15	KG
344493 520898	398	7,960.00	FT	466.60	KG
344494 520898	403	8,060.00	FT	472.46	KG
344495 521033	396	7,920.00	FT	464.26	KG
344496 520529	200	4,000.00	FT	234.47	KG

Heat Analysis

Heat No	C	Si	Mn	P	S	Cr	Ni	Mo	Co	Cu	N
520529	.018	.39	1.59	.028	.009	16.81	12.44	2.04	.095	.26	.028
Melt Source: Sandvik, Sweden						Melt Method: Electric Furnace					
520898	.021	.40	1.53	.028	.010	16.92	12.44	2.05	.083	.26	.033
Melt Source: Sandvik, Sweden						Melt Method: Electric Furnace					
521033	.019	.37	1.66	.031	.009	16.91	12.44	2.03	.100	.32	.027
Melt Source: Sandvik, Sweden						Melt Method: Electric Furnace					

Product Analysis

520529	.019	.39	1.59	.028	.008	16.73	12.42	2.02	.093	.26	.023
520898	.022	.40	1.54	.027	.009	16.85	12.34	2.03	.082	.26	.030
521033	.020	.40	1.63	.030	.007	16.90	12.46	2.00	.100	.31	.023

CP-46183 # 38035316

# ACL Manufacturing Inc.

## ACL 5500/5100 Shipping Checklist

PO Number 1296

Date March 16, 2010

Ship To Name

Address

City

				X
Igniter				
Ceramic with 1/8" Rod				✓
Ceramic Holder				✓
Metal Strain Relief				✓
Control Box	12	(24)	120	
High Pot Test label for 120 board				N/A
Extra Fuse				✓
Mounting Hardware				✓
Booklet				✓
ACL M-50A Mixer with ACL Sticker & Ground Lug Label				✓
Speed Control Valve				✓
Non-Metallic Seal Tight Flex c/w Connectors				✓
10' Ground Wire				✓
10' Ignition Cable				✓
Flame Current Test Leads				✓
Nozzle				✓
Conduit Seal				✓
***** ☺ ☺ ☺ *****				✓
Shipped By	DK			
Serial Number	55-12124-031510-08			

### ACL 5500 Test Procedure

Date March 16, 2010

P.O. # 1296

ACL Serial # 55-12124 - 031510 - 08

Tested by \_\_\_\_\_

- Test @ 12 VDC
- 9 LED test
- Power On LED
- Pilot On LED
- Main On LED
- Power Fail
- Stop/Start OK
- Proof of Closure (POC)
- Remote S.D.
- Remote Start
- Shutdowns-High Pres, Low pres, Hi temp, Low level, Aux 1
- Alarm Status
- Strong & consistent spark
- 20 secs to Main on
- Temp Control
- Flame fail-burner 1 (slow flash)
- Flame fail-burner 2 (fast flash)
- No Pilot without burner jumper
- Flame Current strong and reads: 3.4
- Ribbon cable pull test

#### **CHECK FOR:**

- Screw sockets in board
- Power pack epoxied
- Extra fuse in place
- High pot function test      Calibration status      Tested Voltage
- High pot test sticker
- CSA label
- All jumpers tightened
- Other terminal strip screws fully opened
- CAUTION: Non-metallic closure label included**
- Module file #LR92893
- Diodes w/wiring diagram label (DC only)

PO. 20551-C3168 PPW Apr. 14/10  
5010

Ce = 0.401  
Mn/C = 4.2  
C + Mn/14 = 0.43  
C + Mn/16 = 0.35

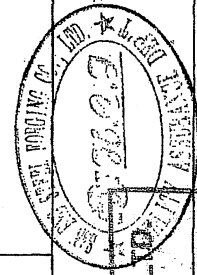
**SAN ENG STEEL FORGING CO LTD**  
311, Jen Hsin Road, Jen Wu Hsiang  
Kaohsiung Hsiang, Taiwan, R.O.C.  
TEL: 07-3724249 ; FAX: 07-3712923  
URL: www.saneng.com.tw  
e-mail: saneng@ksts.seed.net.tw

**MILL TEST CERTIFICATE**

Certificate No.: SE080372  
Date: 10/15/2008



PRODUCT		MATERIAL SPECIFICATIONS		DIMENSIONAL SPECIFICATIONS														
FORGED CARBON STEEL FLANGES		ASTM A105-06/ASME SA105-07		ASME B16.5-03 CSA Z245.12														
Item No.	CUSTOMER P/N	DESCRIPTION	QUANTITY	CHEMICAL COMPOSITION (%)														
				C	Si	Mn	P	S	Cu	Cr	Ni	Mo	V	Nb	N	CE(*)		
1		1500 SORF SOLID 4" A105N	5 PCE	0.350	0.100	0.800	0.035	0.040	0.400	0.300	0.400	0.120	0.080	0.020	-	-	-	-
2		150 SORF SOLID 2" A105N	1 PCE	0.192	0.260	0.890	0.013	0.014	0.009	0.012	0.049	0.002	0.004	0.005	0.006	0.347		
3		300 SORF SOLID 4" A105N	2 PCE	0.190	0.320	0.940	0.019	0.011	0.190	0.130	0.170	0.020	0.003	0.001	0.013	0.401		
				0.200	0.220	1.160	0.019	0.013	0.100	0.080	0.070	0.005	0.003	0.005	0.010	0.422		
Item No.	Heat No.	T.S.(*) (MPa)	Y.S.(*) (MPa)	E.L.(*) (%)	Hardness (H-B)	R.A.(*) (%)	Impact Test		Material Supplier	HEAT TREATMENT(*)	REMARKS							
							Minimum	Joule										
1	738963	485.0	250.0	22.0	187	30.0	1	2	NTMK	880°C X3HRS	CONFORMS WITH NACE MR01-75/03 AND MR01-03/07/ISO15156.2							
2	64325	505.0	315.8	32.0	154	67.0			RED OCTOBER		CONFORMS WITH Z245.12 CAT I GR.248 SOUR SERVICE-05							
3	48960	503.1	325.6	32.4	154	67.7			OEMK									
		508.0	311.9	35.4	155	69.5												



RUSHTON GAS & OIL EQUIP. LTD.

Manager of Quality Assurance Dept

MTR CONFORM TO:

ASME SEC. II-A ED. 07 ADD. 09

QA: [Signature]

DATE: April 14/10

\*1: T.S. = Tensile Strength, Y.S. = Yield Strength, E.L. = Elongation, R.A. = Reduction of Area.  
 \*2: N=Normalized, A=Annealed, Q=Quenched, T=Tempered, S,T=Solution Treated, S,R=Stress Relieved,  
 A,C=Air Cooled, F,C=Furnace Cooled, W,C=Water Cooled, O,C=Oil Cooled.  
 \*3: C.E. Value = C + (Mn/6) + (Cr + Mo +V) / 5 + (Ni + Cu) / 15

We hereby certify that the material has been tested in accordance with the above specification and also with the requirements called for by the above order.

3, 1, 2,



SAN ENG STEEL FORGING CO. LTD  
 311, Jen Hsin Road, Jen Wu Hsiang  
 Kaohsiung Hsien, Taiwan, R.O.C.  
 TEL: 07-3724249; FAX: 07-3712923  
 URL: www.saneng.com.tw  
 e-mail: saneng@ksis.seed.net.tw

**MILL TEST CERTIFICATE**

EN10204-3.1.B(DIN50049/3.1.B)  
 Customer: SEYBOLD INTERNATIONAL CORP.  
 Order No.: 7001984(1)-T/A

Certificate No.: SE-1984A  
 Date: 12/23/2009  
 Page: 5 OF 6

PRODUCT		MATERIAL SPECIFICATIONS		DIMENSIONAL SPECIFICATIONS														
FORGED CARBON STEEL FLANGES		ASTM A105-05/ASME SA105-07		ASME B16.5-03 CSA Z245.12														
Item No.	CUSTOMER P/N	DESCRIPTION	QUANTITY		CHEMICAL COMPOSITION (%)										CE(*)			
			Min	Max	C	Si	Mn	P	S	Cu	Cr	Ni	Mo	V		Nb	N	
41		600 RL RF 20" A105N			0.203	0.240	1.000	0.016	0.009	0.400	0.300	0.400	0.120	0.060	0.020	-	-	0.378
42		2500 BLRF 2" A105N			0.200	0.230	1.120	0.007	0.011	0.050	0.070	0.030	0.005	0.003	0.005	0.008	-	0.407
43		150 SORF 1 1/2" A105N			0.190	0.200	1.140	0.008	0.011	0.110	0.080	0.070	0.005	0.003	0.005	0.009	-	0.409
44		150 SORF 2" A105N			0.222	0.270	1.040	0.015	0.012	0.005	0.016	0.051	0.002	0.009	0.005	0.003	-	0.403
45		150 SORF 2 1/2" A105N			0.209	0.260	1.010	0.012	0.014	0.012	0.034	0.055	0.002	0.023	0.005	0.007	-	0.389
46		160 SOFF 2" A105N			0.230	0.120	1.020	0.008	0.009	0.070	0.040	0.040	0.005	0.003	0.005	0.010	-	0.416
47		300 SORF 1/2" A105N			0.209	0.240	1.000	0.011	0.016	0.005	0.020	0.050	0.002	0.004	0.001	0.005	-	0.384
48		300 SORF 3/4" A105N			0.209	0.240	1.000	0.011	0.016	0.005	0.020	0.050	0.002	0.004	0.001	0.005	-	0.384
49		300 SORF 1" A105N			0.206	0.230	1.000	0.016	0.014	0.006	0.023	0.055	0.002	0.009	0.005	0.005	-	0.382
50		300 SORF 1 1/4" A105N			0.200	0.170	1.110	0.010	0.015	0.070	0.040	0.030	0.005	0.003	0.005	0.010	-	0.401
Heat No.		T.S.(*)	Y.S.(*)	E.L.(*)	Hardness	R.A.(*)	Impact Test		Material Supplier		HEAT TREATMENT(*)		REMARKS					
Item No.		(MPa)	(MPa)	(%)	(HB)	(%)	Temp	Minimum	Joule	NTMK	NTMK	880°C X3HRS	CONFORMS WITH NACE MR0103-07 AND NACE MR0175/ISO15156.2					
41	935806	508.0	317.7	34.6	187	30.0	1	2	3	OEMK	OEMK		CONFORMS WITH Z245.12 CAT I GR.248 SOUR SERVICE-05					
42	41367	535.4	348.1	33.8	154	65.9				NTMK	NTMK		TEST SPECIMEN ORIENTATION: TRANSVERSE					
43	29570	491.3	298.1	35.4	150	65.9				OEMK	OEMK							
44	920981	521.7	337.3	32.2	157	65.0				NTMK	NTMK							
45	931276	511.9	321.7	34.2	155	68.0				NTMK	NTMK							
46	49187	513.9	296.2	33.4	162	67.7				OEMK	OEMK							
47	920953	505.0	325.6	33.2	154	68.0				NTMK	NTMK							
48	920953	505.0	325.6	33.2	154	68.0				NTMK	NTMK							
49	921025	508.0	321.7	32.8	154	64.0				NTMK	NTMK							
50	13182	517.8	333.4	35.6	150	67.7				OEMK	OEMK							



\*1: T.S. = Tensile Strength, Y.S. = Yield Strength, E.L. = Elongation, R.A. = Reduction of Area.  
 \*2: N=Normalized, A=Annealed, O=Quenched, T=Tempered, S.T=Solution Treated, S.R=Stress Relieved,  
 A.C=Air Cooled, F.C=Furnace Cooled, W.C=Water Cooled, O.C=Oil Cooled.  
 \*3: C.E. Value = C + (Mn/16) + (Cr + Mo + V) / 5 + (Ni + Cu) / 15

We hereby certify that the material has been tested in accordance with the above specification and also with the requirements called for by the above order.

Manager of Quality Assurance Dept

RUSHTON GAS & OIL EQUIP. LTD.

MTR CONFORM TO:

ASME SEC. I-A ED. 07 ADD: 07

QA: [Signature]  
 DATE: May 12/10

PO 20626 - CS 168 PPW  
 SOLO

P.O. 20526 - C3168 HM  
 4H  
 10.3514  
 Apr 9/10



SEDE AMMINISTRATIVA E STABILIMENTO:  
 23861 CESANA BRIANZA (LC) - Italy  
 Via G. Parini, 28  
 Tel. +39 031.655441  
 Fax +39 031.655149  
 quality.mf@farmas.com

COMPANY  
 WITH QUALITY MANAGEMENT  
 SYSTEM CERTIFIED BY DINV  
 = ISO 9001 : 2000 =

GLOBAL GAEI SERVICE LTD  
 Unit 1E, Block 71, The Plaza Nangor Road  
 DUBLIN 12  
 IE

CERTIFICATO DI COLLAUDO SECONDO EN 10204 - 3.1 INSPECTION CERTIFICATE

TAMPAGGIO A CALDO DI ACCIAI COMUNI - LEGATI E INOSSIDABILI  
 SALA PROVE E ANALISI MATERIALI / MATERIAL TEST DEPARTMENT  
 Certificato generato da un sistema informatico secondo la norma EN10204, valido senza firma / This certificate has been generated by computer and need not to be signed for validity acc. to EN10204

Pag. 4 - 8

COD. COL. COLATA HEAT CODE HEAT	VS. ORDINE YOUR REFERENCE	Q.TA. Q.TY	DESCRIZIONE DESCRIPTION	DUREZZA HARDNESS	RESILLENZA / IMPACT TEST - JOULE/cm <sup>2</sup>	FORNO / FURNACE	ORIGINE / ORIGIN
09/79423 0002	519/CCTF	150,00	W/N 150 RF 4" STD	A105	20 86 80 89	ELECTRIC FURNACE	EUROPE
MATERIALE / MATERIAL ASTM A105							
PROVETTA / TEST SPECIMEN SEZ. mm <sup>2</sup> SECT. mm <sup>2</sup>	FORMA SHAPE	ALLUNGAMENTO ELONGATION	CONTRAZIONE REDUCTION OF AREA	DUREZZA HARDNESS	RESILLENZA / IMPACT TEST - JOULE/cm <sup>2</sup>	FORNO / FURNACE	ORIGINE / ORIGIN
126,60 50,80	1	34,0	59,0	159,0 - 163,0	20 86 80 89	ELECTRIC FURNACE	EUROPE

COD. COL. COLATA HEAT CODE HEAT	VS. ORDINE YOUR REFERENCE	Q.TA. Q.TY	DESCRIZIONE DESCRIPTION	DUREZZA HARDNESS	RESILLENZA / IMPACT TEST - JOULE/cm <sup>2</sup>	FORNO / FURNACE	ORIGINE / ORIGIN
09/79423 0002	519/CCTF	150,00	W/N 150 RF 4" STD	A105	20 86 80 89	ELECTRIC FURNACE	EUROPE
MATERIALE / MATERIAL ASTM A105							
PROVETTA / TEST SPECIMEN SEZ. mm <sup>2</sup> SECT. mm <sup>2</sup>	FORMA SHAPE	ALLUNGAMENTO ELONGATION	CONTRAZIONE REDUCTION OF AREA	DUREZZA HARDNESS	RESILLENZA / IMPACT TEST - JOULE/cm <sup>2</sup>	FORNO / FURNACE	ORIGINE / ORIGIN
126,60 50,80	1	34,0	59,0	159,0 - 163,0	20 86 80 89	ELECTRIC FURNACE	EUROPE

COD. COL. COLATA HEAT CODE HEAT	VS. ORDINE YOUR REFERENCE	Q.TA. Q.TY	DESCRIZIONE DESCRIPTION	DUREZZA HARDNESS	RESILLENZA / IMPACT TEST - JOULE/cm <sup>2</sup>	FORNO / FURNACE	ORIGINE / ORIGIN
09/79423 0002	519/CCTF	150,00	W/N 150 RF 4" STD	A105	20 86 80 89	ELECTRIC FURNACE	EUROPE
MATERIALE / MATERIAL ASTM A105							
PROVETTA / TEST SPECIMEN SEZ. mm <sup>2</sup> SECT. mm <sup>2</sup>	FORMA SHAPE	ALLUNGAMENTO ELONGATION	CONTRAZIONE REDUCTION OF AREA	DUREZZA HARDNESS	RESILLENZA / IMPACT TEST - JOULE/cm <sup>2</sup>	FORNO / FURNACE	ORIGINE / ORIGIN
126,60 50,80	1	34,0	59,0	159,0 - 163,0	20 86 80 89	ELECTRIC FURNACE	EUROPE

RUSHTON GAS & OIL EQUIP. LTD.

MTR-CONFORMITO.

ASME SEC. II-A ED. 2009

QA: *[Signature]*  
 DATE: Apr 11/10

UFFICIO CONTROLLO QUALITA'  
 QUALITY CONTROL DEPARTMENT

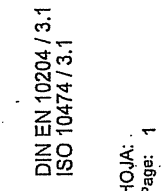
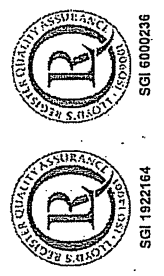
ENTE UFFICIALE DI COLLAUDO  
 INSPECTION AUTHORITY

MARCHIO PRODUZIONE  
 MANUFACTURER'S SYMBOL

MFF

NOTE MATERIAL IN ACCORDANCE WITH NACE MR-0175/2003 ISO 15156  
 NOTES MATERIAL IN ACCORDANCE WITH NACE MR-0103/2007

PO. 20548 - C3168 PPW Apr. 13/10



**CERTIFICADO DE INSPECCION**  
 Inspection Certificate - Certificat de Réception  
 DIN EN 10204 / 3.1  
 ISO 10474 / 3.1

CLIENTE / Customer / Client  
 COMCO PIPE & SUPPLY COMPANY  
 A DIVISION OF RUSSEL METALS  
 5910-17 ST. NW PO BOX 457  
 EDMONTON ALBERTA T5J 2K1 CANADA

ULMA FORJAJA, S.COOP.  
 Bº Zubillaga, 3 - Apdo. 14  
 20560 OÑATI (Gipuzkoa) SPAIN  
 Tel.: 34 - 943 780552  
 Fax: 34 - 943 781808  
 E-mail: ulma@ulmapijng.com  
 75810

Certified acc. PED 97/23/EC  
 by TÜV Rheinland  
 N.º 01 202 EQ 02 7443

HOJA: 1  
 Page: 1

FECHA: 19/02/2010  
 Date: 130136

SU PEDIDO N.º  
 Your Order No. E1-325  
 Votre Cde. N.º

PRODUCTO  
 Article - Produit  
 FLANGES  
 ASME B16.5-09

MARCA DEL FABRICANTE  
 Mark of factory  
 Marque du fabricant

DEPARTAMENTO QUALITY ASSURANCE  
 Section Département

NACE MR0103103 & MR0175103  
 CAN/CSA-Z245.12  
 Gr.248 CAT 1

MATERIAL CORRESPONDIENTE  
 ASTM A105N-05  
 ASME SA105N-05

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

PARTIDA Item Poste	CANTIDAD Quantity Quantité	DESCRIPCION Description Description	OBSERVACIONES Remarks Observations	COLADA N.º Heat No N.º Coulé	RESISTENCIA T. Strength Resist Rupt N/mm2	ALARGAM. Elongation Allongement Lo. 4 d %	ESTRICCION Red. Area Striction %	RESILIENCIA Impact test Résilience Joules	PROBETA - SECUREN		DUREZA Hardness Dureté HB
									MEDIA Average Moyenne	°C	
4 F 14 1 R B 5	21	BLIND 14 150LB RF A105N	NE	385A9	503	29,00	54,20			148 155	
15 FL 4 1 R W STD 5	196	WN 4 150LB STD/40 RF A105N	NE	111T0	520	29,00	50,90			150 157	
17 F 12 3 R B 5	21	BLIND 12 300LB RF A105N	NE	385A9	503	30,7	54,20			148 155	
19 F 12 6 R B 5	6	BLIND 12 600LB RF A105N	NE	263A8	516	30,40	58,30			149 155	
19 F 12 6 R B 5	4	BLIND 12 600LB RF A105N	NE	263A9	516	31,2	54,80			149 155	
26 FL 8 3 R W STD 5	160	WN 8 300LB STD/40 RF A105N	NE	9T0	518	29,20	51,30			150 156	
28 FL 4 6 R W XS 5	8	WN 4 600LB XS/80 RF A105N	NE	234A9	518	30,8	54,10			148 154	
28 FL 4 6 R W XS 5	1	WN 4 600LB XS/80 RF A105N	NE	263A9	516	31,2	54,80			149 155	
28 FL 4 6 R W XS 5	1	WN 4 600LB XS/80 RF A105N	NE	269A9	513	30,8	53,00			148 156	
28 FL 4 6 R W XS 5	8	WN 4 600LB XS/80 RF A105N	NE	338A9	513	30,40	55,00			149 156	

CE = 0.421  
 Mn/C = 5.1  
 S + Mn/4 = 0.46  
 C + Mn/8 = 0.37

COMPOSICION QUIMICA - STEEL MARKER'S LADLE ANALYSIS - ANALYSE CHIMIQUE															
COLADA N.º Heat No N.º Coulé	C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	Nb %	V %	Cu %	AI %	TI %	N %	CEq %
11T0	0.200	0.210	1.020	0.019	0.013	0.080	0.100	0.010	0.005	0.001	0.390	0.000	0.000	0.000	0.421
234A9	0.200	0.210	0.870	0.012	0.007	0.090	0.100	0.010	0.003	0.002	0.230	0.022	0.000	0.000	0.387
263A8	0.180	0.210	0.890	0.019	0.004	0.100	0.080	0.020	0.007	0.002	0.270	0.030	0.000	0.000	0.376
263A9	0.200	0.240	0.810	0.009	0.010	0.090	0.100	0.020	0.007	0.001	0.230	0.032	0.000	0.000	0.379
269A9	0.190	0.230	0.820	0.015	0.007	0.090	0.110	0.020	0.002	0.005	0.230	0.025	0.000	0.000	0.372
338A9	0.200	0.270	0.860	0.007	0.001	0.090	0.100	0.040	0.006	0.002	0.290	0.030	0.000	0.000	0.396
385A9	0.180	0.160	0.820	0.011	0.007	0.080	0.120	0.070	0.002	0.001	0.200	0.021	0.000	0.000	0.369
9T0	0.190	0.170	0.820	0.015	0.020	0.050	0.080	0.010	0.005	0.001	0.340	0.000	0.000	0.000	0.367

- Les dimensions y la condition 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

**RUSINGTON GAS & STEEL QUALITY ASSURANCE LTD.**  
 Dpto. de Garantía de Calidad  
 Quality Assurance Dept.

MTR CONFIRMATION

ASME SEC. IIA ED. 07 ADD: 09

QA: [Signature]

DATE: April 14/10

(\*) OBSERVACIONES:  
 Remarks  
 Observations

N NORMALIZED AT 900 C AND ALLOWED TO COOL IN STILL AIR

Ce = 0.369  
Mn/C = 4.7  
S + Mn/4 = 0.41  
C + Mn/6 = 0.34

ppw  
Apr 13/10

**METALFAR**  
PRODOTTI INDUSTRIALI S.P.A.  
SEDE AMMINISTRATIVA E STABILIMENTO:  
23861 CESANA BRIANZA (LO) - Italy  
Via G. Parini, 28  
Tel. +39 031.655441  
Fax +39 031.655149  
quality.mt@larimas.com

CERTIFICATO DI COLLAUDO SECONDO EN 10204 - 3.1 INSPECTION CERTIFICATE  
SILBO INDUSTRIES  
50 CHESTNUT RIDGE ROAD SUITE 204  
07845 MONTVALE N.J. US

COMPANY  
WITH QUALITY MANAGEMENT  
SYSTEM CERTIFIED BY DNV  
= ISO 9001:2000 =

SALA PROVE E ANALISI MATERIALI / MATERIAL TEST DEPARTMENT  
Certificato generato da un sistema informatico secondo la norma EN10204, valido senza firma / This certificate has been generated by computer and need not to be signed for validity acc. to EN10204

Pag. 4 - 11

COD. COL. HEAT	POS. ITEM	VS. ORDINE YOUR REFERENCE	Q.TA. DESCRIPTION	DUREZZA HB	RESILLENZA / IMPACT TEST - JOULE/cm2	SNERVAMENTO YIELD POINT N/mm2 >=0.2%	FORMA SHAPE	PROVETTA / TEST SPECIMEN	ROTURA TENSILE STRENGTH N/mm2 >=	CONTRAZIONE REDUCTION OF AREA %>=	ALLUNGAMENTO ELONGATION %>=	C%	SIP%	Mn%	S%	P%	Cr%	Ni%	Mo%	Cu%	V%	Nb%	N%	Al%	C.E.%	B%	ORIGINE / ORIGIN	
ASTM A105	09/35498	60141/B	WIN 150 RF 6" XS	A105	59.0	159.0 - 163.0	1	50,80	527,0	30,0	32,0	0,200	0,250	0,970	0,015	0,011	0,130	0,050	0,010	0,200	0,000	0,000	0,000	0,000	0,000	0,000	EUROPE	
MATERIALE / MATERIAL																												
ASTM A105	09/77048	60141/B	WIN 150 RF 3" XS	A105	57.0	166.0 - 170.0	1	50,80	552,0	32,0	32,0	0,210	0,240	0,990	0,013	0,012	0,070	0,060	0,010	0,180	0,006	0,000	0,000	0,000	0,000	0,000	EUROPE	
MATERIALE / MATERIAL																												
ASTM A105	09/77048	60141/B	SW 150 RF 1.1/2" 80	A105	60.0	159.0 - 163.0	1	50,80	521,0	34,0	34,0	0,190	0,180	0,890	0,015	0,014	0,070	0,050	0,010	0,170	0,007	0,001	0,001	0,000	0,000	0,000	EUROPE	
MATERIALE / MATERIAL																												
ASTM A105	09/77048	60141/B	SW 150 RF 1.1/2" 80	A105	60.0	159.0 - 163.0	1	50,80	521,0	34,0	34,0	0,190	0,180	0,890	0,015	0,014	0,070	0,050	0,010	0,170	0,007	0,001	0,001	0,000	0,000	0,000	EUROPE	
MATERIALE / MATERIAL																												

COD. COL. HEAT	POS. ITEM	VS. ORDINE YOUR REFERENCE	Q.TA. DESCRIPTION	DUREZZA HB	RESILLENZA / IMPACT TEST - JOULE/cm2	SNERVAMENTO YIELD POINT N/mm2 >=0.2%	FORMA SHAPE	PROVETTA / TEST SPECIMEN	ROTURA TENSILE STRENGTH N/mm2 >=	CONTRAZIONE REDUCTION OF AREA %>=	ALLUNGAMENTO ELONGATION %>=	C%	SIP%	Mn%	S%	P%	Cr%	Ni%	Mo%	Cu%	V%	Nb%	N%	Al%	C.E.%	B%	ORIGINE / ORIGIN	
ASTM A105	09/77048	60141/B	SW 150 RF 1.1/2" 80	A105	86	166.0 - 170.0	1	50,80	552,0	32,0	32,0	0,210	0,240	0,990	0,013	0,012	0,070	0,060	0,010	0,180	0,006	0,000	0,000	0,000	0,000	0,000	EUROPE	
MATERIALE / MATERIAL																												
ASTM A105	09/77048	60141/B	SW 150 RF 1.1/2" 80	A105	86	166.0 - 170.0	1	50,80	552,0	32,0	32,0	0,210	0,240	0,990	0,013	0,012	0,070	0,060	0,010	0,180	0,006	0,000	0,000	0,000	0,000	0,000	EUROPE	
MATERIALE / MATERIAL																												

COD. COL. HEAT	POS. ITEM	VS. ORDINE YOUR REFERENCE	Q.TA. DESCRIPTION	DUREZZA HB	RESILLENZA / IMPACT TEST - JOULE/cm2	SNERVAMENTO YIELD POINT N/mm2 >=0.2%	FORMA SHAPE	PROVETTA / TEST SPECIMEN	ROTURA TENSILE STRENGTH N/mm2 >=	CONTRAZIONE REDUCTION OF AREA %>=	ALLUNGAMENTO ELONGATION %>=	C%	SIP%	Mn%	S%	P%	Cr%	Ni%	Mo%	Cu%	V%	Nb%	N%	Al%	C.E.%	B%	ORIGINE / ORIGIN	
ASTM A105	09/77048	60141/B	SW 150 RF 1.1/2" 80	A105	85	166.0 - 170.0	1	50,80	521,0	34,0	34,0	0,190	0,180	0,890	0,015	0,014	0,070	0,050	0,010	0,170	0,007	0,001	0,001	0,000	0,000	0,000	EUROPE	
MATERIALE / MATERIAL																												
ASTM A105	09/77048	60141/B	SW 150 RF 1.1/2" 80	A105	85	166.0 - 170.0	1	50,80	521,0	34,0	34,0	0,190	0,180	0,890	0,015	0,014	0,070	0,050	0,010	0,170	0,007	0,001	0,001	0,000	0,000	0,000	EUROPE	
MATERIALE / MATERIAL																												

RUSHTON GAS & OIL EQUIP. LTD.  
MTR CONFORM TO:  
ASME SEC. II-A ED. 07  
OFFICE CONTROLLO QUALITA' / QUALITY CONTROL DEPARTMENT  
ENTE UFFICIALE DI COLLAUDO / INSPECTION AUTHORITY  
MARCHIO PRODUZIONE / MANUFACTURER'S SYMBOL  
MFF

QA: [Signature]  
DATE: Apr 14/10

S. Corti



PPW April 13/10



# INSPECTION CERTIFICATE

(EN10204:2004 3.1 / ISO 10474:1991 3.1B)

1499-1, SONG JUNG-DONG,  
GANGSEO-GU BUSAN, KOREA  
Tel : 82-51-831-6550  
Fax : 82-51-831-6886

Customer	Comco Pipe & Supply		Certificate No.	20091203512	Date	2009/12/16	
P.O No.	E1008771		Project Name				
Job No.			POR/Req'n No				
Specification for Material	ASTM/ASME A/SA234 WPB(2007Ed.) NACE MR0175/MRO103-2003		Starting Material	SEAMLESS PIPE			
Specification for Inspection	ASME B16.9-2003		Dimension and Visual Inspection	GOOD			
Heat Code No [HCN]	No.	Descriptions				Q'ty (Pcs)	Heat Treatment
BA252D	0045	ECC REDUCER	STD	B.W	4" x 3"	12	SR: 670°C
S959	0048	90° ELBOW SHORT	X-S	B.W	2"	25	*Hot-formed
AP923	0049	90° ELBOW SHORT	XX-S	B.W	3"	5	*Hot-formed

## CHEMICAL COMPOSITION (%)

Heat Code No [HCN]	Spec.	CHEMICAL COMPOSITION (%)														Raw Heat No/Raw Maker
		C	Si	Mn	P	S	Ni	Cr	Mo	Cu	V	Cb	Ti	B	C.E	
		Max.	0.23	-	1.06	0.050	0.010	0.40	0.40	0.15	0.40	0.080	-	-	-	
BA252D	L	0.18	0.22	0.64	0.016	0.008	0.02	0.05	0.01	0.01	0.000	0.000	0.000	0.0000	0.301	J9K1572/SUMITOMO
	P	0.17	0.21	0.65	0.018	0.009	0.01	0.04	0.02	0.03	0.000	0.000	0.001	0.0003	0.293	
S959	L	0.21	0.19	0.71	0.018	0.004	0.03	0.06	0.01	0.01	0.000	0.000	0.000	0.0000	0.345	22178/NKK
	P	0.20	0.21	0.72	0.020	0.002	0.02	0.05	0.03	0.02	0.001	0.000	0.002	0.0002	0.339	
AP923	L	0.18	0.18	0.65	0.011	0.001	0.02	0.03	0.02	0.04	0.001	0.001	0.001	0.0001	0.303	21203/TENARIS
	P	0.17	0.19	0.64	0.013	0.003	0.01	0.04	0.01	0.03	0.002	0.003	0.002	0.0003	0.290	

CE = 0.293  
Mn/C = 3.8  
3 + Mn/4 = 0.33  
C + Mn/8 = 0.28

## MECHANICAL PROPERTIES

Heat Code No [HCN]	Spec.	Y.S			T.S		E.L (%)	Hardness Test	
		Ksi						HB	
		Max.	Min.	35	85	60		30	197
BA252D	P	47.6	72.5	38.9	142	144			
S959	P	50.2	75.9	53.0	152	155			
AP923	P	38.2	66.9	33.5	141	143			

**RUSHTON GAS & OIL EQUIP. LTD.**  
MTR CONFORM TO:  
ASME SEC. II-A ED. 07 ADD:09  
QA: [Signature]  
DATE: April 14/10

We hereby certify that the material herein has been made and tested in accordance with the above specification and also with the requirements called for by the above order.

Remark : \*CSA Z245.11 Gr 241 Cat I Sour Service

\*Hot-formed : Hot formed at a temperature above 620 °C and below 990 °C, and cooled in still air.

Legend:  
HB: Brinell  
ST: Solution Treatment  
SR: Stress Relieving  
N: Normalized  
T: Tempered  
A: Annealed  
Q: Quenched  
(G): Hot-Dip Galvanized Coating  
AC: Air Cool  
OC: Oil Cool  
WQ: Water Quenched  
WC: Water Cool  
L: Ladle  
P: Product

Reviewed by : \_\_\_\_\_  
 Witnessed by : \_\_\_\_\_

Approved by : [Signature]  
Director of Quality Assurance Dept



Thai Benkan Co., Ltd.  
 58 Soi Watkrunai, Bangkru, Prapadaeng,  
 Samutprakarn, 10130 Thailand.  
 M Y Certificate No.

# INSPECTION CERTIFICATE

TO EN10204 3.1

Purchase Order No. Job No.

E-No. MB-360 E1008145

No.	Boron (%) (Note 1)	MFG. No. (Heat Identification No.)	Specification for Material Made from Seamless Pipe	Product & Size (T <sup>1</sup> )	Quantity	Heat Treatment (Note 1)	Visual Examination	Dimensional Inspection	Chemical % (No)
1	0.0001	51D20014	RC WPB 8 X 6 XS	15	N	Good	HB : 145 - 160	Good	2
2	0.0005	51D20017	RE WPB 3 X 2 XS	25	N		HB : 120 - 135		0
3	0.0005	51D20018	RE WPB 4 X 2 STD XS	10	N		HB : 130 - 145		1
4									
5									

Specification	Chemical Composition %											Tension Test #2			
	C	Si	Mn	P	S	Cu	Ni	Cr	Mo	V	Nb	C.E.	YS	TS	E
Min.	X 100	X 100	X 100	X 1000	X 1000	X 100	X 100	X 100	X 100	X 1000	X 1000	X 100		MPa.	%
Max.		10	29										240	415	30
Material Heat No.	23		106	50	10	40	40	40	15	80	20	40		655	
1	J8L3518	19	18	74	9	1	2	5	1	0	0	33	296	453	50
2	78M0761	15.9	22	70	10	18	8	8	2.1	22	1	32	312	462	42
3	78M3427	17.8	23	74	4	4	15	8	1.2	26	1	33	318	469	33
4															
5															

(Note 1) A : Hot formed with final temperature between 620 °C-980°C. Air Cooling N : Normalizing 910°Cx0.5 HR. Air Cooling \*N : Normalizing 910°Cx0.5 HR. Air Cooling (Specification for material made from plate) S : Stress Relieving 675° Cx0.5 HR. Air Cooling

(NOTE 1) SPECIFICATION OF BORON COMPOSITION (%) : MAX 0.0005  
 (NOTE 2) SPECIFICATION OF TENSILE STRENGTH (%) : MAX 100%  
 (NOTE 3) SPECIFICATION OF PARTICLE EXAMINATION FOR TEE ONLY :  
 ASME SEC. II-A ED.07 ADD: 09

We hereby certify that the product described herein has been manufactured in accordance with the specifications concerned and also with the purchaser's requirements and that the test results shown herein are correct.

\* 1 : T<sup>1</sup> symbolized wall thickness in mm. \* 2 : YS Yield strength TS = Tensile strength E = Elongation

RUSHION GAS & OIL EQUIP LTD  
 MTR CONFORM TO:  
 ASME SEC. II-A ED.07 ADD: 09  
 GA: [Signature]  
 DATE: April 14/10

Quality Assurance Manager  
 Thai Benkan Co., Ltd.

DATE: 2008-12-19 April  
 ORDER NO: 8459/E1008374 13/10  
 P.I. NO: 8101-1  
 CERTIFI. NO: 638

**INSPECTION CERTIFICATE**  
**RIGID**  
 INDUSTRIES CO., LTD.  
 8, MEI-CHUNG RD, NIAO-SONG,  
 KAOHSIUNG HSIEN, 83301 TAIWAN  
 TEL: 886-77310527-8  
 FAX: 886-77315887

PURCHASER: SEYBOLD  
 ASTM A234 WPB-07  
 ASME SA234 WPB-04  
 MATERIALS: ASTM A106 Gr.B (SEAMLESS PIPE)  
 INSP. SPEC.: ASME B16.9 - 03

ACCORDING TO EN10204/DIN50049/3.1

ITEM NO.	PRODUCT & SIZE	QUANTITY PCS	MFG NO.	VISUAL & DIMENSIONAL INSPECTION	HARDNESS MAX 197 HB	HEAT TREATMENT (NOTE)	MAGNETIC PARTICLE EXAMINATION	IMPACT TEST (J)
17	CON-RED 10X6" XH	5	8F3578	GOOD	134 - 140	N		
18	CON-RED 16X8" STD	5	8G6212	GOOD	158 - 164	N		
19	ECC-RED 2X1.1/4" XH	5	6K5591	GOOD	141 - 150	N		
20	ECC-RED 3X2" XH	25	8H5046	GOOD	147 - 152	N		
21	ECC-RED 6X4" STD	30	8G7199	GOOD	110 - 111	N		
22	ECC-RED 8X6" XH	10	8E5082	GOOD	135 - 140	N		
23	ECC-RED 14X12" STD	5	7L4990	GOOD	138 - 142	N		
24	TEE 3" 160	75	7D2276	GOOD	135 - 177	N		
25	TEE 4" STD	100	8D3110	GOOD	151 - 157	N		
26	TEE 8" STD	20	8J2004	GOOD	154 - 155	N		

Ct = 0.318  
 Mn/C = 3.1  
 Mn/A = 0.35  
 Mn/B = 0.30

ITEM NO.	MATERIAL CHARGE NO.	CHEMICAL COMPOSITION %													PHYSICAL TEST			
		C	Si	Mn	P	S	Cu	Ni	Cr	Mo	V	Nb	Y S	T S	E	C.E.		
STANDARD		MIN.	MAX.												KSI	KSI	%	X100
17	063278	16	24	66	12	5	3	2	2	<1	<1	20	46.4	71.1	37.0	29		
18	0880712	21	23	60	6	4	4	1	1	1	2	50.1	71.8	42.0	32			
19	J6L5391	10	26	126	2	2	11	<1	<1	1	1	46.3	67.7	63.0	33			
20	PO8600446	20	27	61	3	3	4	1	1	5	52.2	74.0	34.5	31				
21	326999	19	25	54	9	2	3	1	1	<1	<1	43.4	68.6	38.0	29			
22	0633282	14	24	63	10	5	4	2	2	<1	<1	45.0	66.7	42.0	26			
23	73-02690	20	25	48	6	2	3	1	1	3	9	43.5	70.4	36.5	29			
24	0613076	15	20	67	13	5	2	2	2	<1	<1	48.6	71.1	33.0	27			
25	0712410	18	25	64	10	7	4	2	2	1	<1	47.9	74.0	37.5	30			
26	0834104	14	20	72	5	4	3	1	1	<1	<1	46.4	68.1	47.0	28			

(NOTE): A: HOT FORMED WITH FINAL TEMPERATURE BETWEEN 620°C-980°C AIR COOLING.  
 N: NORMALIZING AT TEMPERATURE 880°C X 0.5HR AIR COOLING.  
 NACE MR-01-75-03/ISO15156.2 & NACE MR 0103-03 : SATISFACTORY  
 WE HEREBY CERTIFY THAT THE PRODUCT DESCRIBED HEREIN HAS BEEN MANUFACTURED IN ACCORDANCE WITH THE SPECIFICATIONS CONCERNED AND ALSO WITH THE PURCHASER'S REQUIREMENTS AND THAT THE TEST RESULTS SHOWN HEREIN ARE CORRECT.

RUSHTON GAS & OIL EQUIP. LTD.  
 MANAGER CONFORM TO:  
 ASME SEC. II-A ED-07  
 ADD: MANAGER OF Q.A. DEPT.

*On E Lan*  
 DATE: April 14/10

April 13/10 PPW

CERTIFICATO DI COLLAUDO SECONDO EN 10204 - 3.1 INSPECTION CERTIFICATE

SILBO INDUSTRIES		Certif. N. 322	Del/Dated 27.01.2010
50 CHESTNUT RIDGE ROAD SUITE 204		Fattura / Invoice N. 210	Del/Dated 27.01.2010
07645 MONTVALE N.J.		DDT / Del Note N. 434	Del/Dated 27.01.2010
US		Ns.Ord. / Our ref. N.	

Pag. 13 - 18

valido senza firma / This certificate has been generated by computer and need not to be signed for validity acc. to EN10204

**RUSHTON GAS & OIL EQUIP. LTD.**  
 MTR CONFORM TO:  
 ASME SEC. II-A ED. 07 ADD: 09

SEDE AMMINISTRATIVA E STABILIMENTO:  
 23916 CERIANA BRIANZA (LO) - Italy  
 Via G. Parni, 28  
 Tel: +39 031.655441  
 Fax: +39 031.655149  
 quality.mtr@armas.com

COMPANY  
 WITH QUALITY MANAGEMENT  
 SYSTEM CERTIFIED BY IRV  
 April 14/10 ISO 9001 : 2000 =

**METALFAR**  
 PRODOTTI INDUSTRIALI S.P.A.  
 STAMPAGGIO A CALDO DI ACCIAI COMUNI - LEGATI E INOSSIDABILI  
 SALA PROVE E ANALISI MATERIALI / MATERIAL TEST DEPARTMENT  
 Certificato generato da un sistema informatico secondo la norma EN10204, valido senza firma / This certificate has been generated by computer and need not to be signed for validity acc. to EN10204

COD. COL. COLATA HEAT	POS. ITEM	VS. ORDINE YOUR REFERENCE	DESCRIZIONE Q.TY DESCRIPTION	Q.TA' Q.TY	25,00	W/N 150 RF 1.1/2" STD A105							
MATERIALE / MATERIAL	ASTM A105	99484/B											
PROVETTA / TEST SPECIMEN	FORMA SHAPE	C%	S%	P%	Cr%	Ni%	Mo%	Cu%	V%	Nb%	Al%	C.E.%	B %
126,60	50,80	0,185	0,280	0,014	0,100	0,050	0,010	0,230	0,001	0,002	0,000	0,029	0,000
SECT. mm2	LENGHT mm	SNERVAMENTO YIELD POINT N/mm2 >=0,2%	ROTTURA TENSILE STRENGTH N/mm2 >=	ALLUNGAMENTO ELONGATION %>=	CONTRAZIONE REDUCTION OF AREA %>=	DUREZZA HARDNESS HB							
333,0	538,0	33,0	538,0	58,0	58,0	163,0 - 165,0							
MATERIALE IN ACCORDO A / MATERIAL IN ACC. TO													
ASTM/ASME A 105/SA 105 M - 05													
TRATTAMENTO TERMICO / HEAT TREATMENT													
NORMALIZED AT 920 C - COOLED IN STILL AIR													
ORIGINE / ORIGIN													
EUROPE													
FORMO / FURNACE													
ELECTRIC FURNACE													
DIM.IN ACC. A													
ASME/ANSI B16.5													
VISIVO E DIMENS. VIS. & DIMENS.													
SATISFACTORY													

COD. COL. COLATA HEAT	POS. ITEM	VS. ORDINE YOUR REFERENCE	DESCRIZIONE Q.TY DESCRIPTION	Q.TA' Q.TY	30,00	W/N 150 RF 1.1/2" XS A105							
MATERIALE / MATERIAL	ASTM A105	99484/B											
PROVETTA / TEST SPECIMEN	FORMA SHAPE	C%	S%	P%	Cr%	Ni%	Mo%	Cu%	V%	Nb%	Al%	C.E.%	B %
126,60	50,80	0,195	0,200	0,013	0,200	0,060	0,020	0,180	0,001	0,001	0,000	0,021	0,000
SECT. mm2	LENGHT mm	SNERVAMENTO YIELD POINT N/mm2 >=0,2%	ROTTURA TENSILE STRENGTH N/mm2 >=	ALLUNGAMENTO ELONGATION %>=	CONTRAZIONE REDUCTION OF AREA %>=	DUREZZA HARDNESS HB							
326,0	526,0	34,0	526,0	59,0	59,0	159,0 - 163,0							
MATERIALE IN ACCORDO A / MATERIAL IN ACC. TO													
ASTM/ASME A 105/SA 105 M - 05													
TRATTAMENTO TERMICO / HEAT TREATMENT													
NORMALIZED AT 920 C - COOLED IN STILL AIR													
ORIGINE / ORIGIN													
EUROPE													
FORMO / FURNACE													
ELECTRIC FURNACE													
DIM.IN ACC. A													
ASME/ANSI B16.5													
VISIVO E DIMENS. VIS. & DIMENS.													
SATISFACTORY													

COD. COL. COLATA HEAT	POS. ITEM	VS. ORDINE YOUR REFERENCE	DESCRIZIONE Q.TY DESCRIPTION	Q.TA' Q.TY	20,00	W/N 300 RF 1.1/2" STD A105							
MATERIALE / MATERIAL	ASTM A105	99484/B											
PROVETTA / TEST SPECIMEN	FORMA SHAPE	C%	S%	P%	Cr%	Ni%	Mo%	Cu%	V%	Nb%	Al%	C.E.%	B %
126,60	50,80	0,210	0,220	0,010	0,100	0,050	0,010	0,200	0,001	0,000	0,027	0,408	0,000
SECT. mm2	LENGHT mm	SNERVAMENTO YIELD POINT N/mm2 >=0,2%	ROTTURA TENSILE STRENGTH N/mm2 >=	ALLUNGAMENTO ELONGATION %>=	CONTRAZIONE REDUCTION OF AREA %>=	DUREZZA HARDNESS HB							
340,0	548,0	33,0	548,0	58,0	58,0	164,0 - 166,0							
MATERIALE IN ACCORDO A / MATERIAL IN ACC. TO													
ASTM/ASME A 105/SA 105 M - 05													
TRATTAMENTO TERMICO / HEAT TREATMENT													
NORMALIZED AT 920 C - COOLED IN STILL AIR													
ORIGINE / ORIGIN													
EUROPE													
FORMO / FURNACE													
ELECTRIC FURNACE													
DIM.IN ACC. A													
ASME/ANSI B16.5													
VISIVO E DIMENS. VIS. & DIMENS.													
SATISFACTORY													

0.404  
 Mn/C = 4.6  
 S + Mn/4 = 0.42  
 C + Mn/6 = 0.34

NOTE MATERIAL IN ACCORDANCE WITH NACE MR-0175/2003 ISO 15166 NOTES MATERIAL IN ACCORDANCE WITH NACE MR-0103/2007	UFFICIO CONTROLLO QUALITA' / QUALITY CONTROL DEPARTMENT S. Corti	ENTE UFFICIALE DI COLLAUDO / INSPECTION AUTHORITY	MARCHIO PRODUZIONE / MANUFACTURER'S SYMBOL MFF
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# MATERIAL TEST & INSPECTION CERTIFICATE

**SUNGKWANG BEND CO., LTD.(SKB)**  
 1720, Songjeong-Dong, Gangseo-Ku, Busan, Korea  
 TEL : 82-051-3300-450  
 FAX : 82-051-3300-335  
 http://www.skbernd.com

CUSTOMER: ALLIED FITTINGS  
 PROJECT NAME: N/A  
 According to  
 DIN 50049 3.1 / EN 10204 3.1 / ISO 10474 3.1  
 April 13/10  
 PO 20551-33168 PPW  
 SPEC. FOR MATERIAL ASTM A234WPB-S 06a, ASME SA234WPB-S 04ED  
 SPEC. FOR INSPECTION ASME B16.9  
 SKB JOB NO. 2008080522

PURCHASE ORDER NO. 08230RAB5  
 PJT JOB NO. N/A  
 STARTING MATERIAL SEAMLESS PIPE  
 CERTIFICATE NO. QCLJ2008123057  
 DATE OF ISSUE 2008.12.26  
 VISUAL & DIMENSION SATISFACTORY  
 MILL MAKER Tenaris  
 POR/CODE/TAG NO

NO.	SEQ/LINE/ITEM NO	DESCRIPTION	QTY	HEAT NO.	MFG ID NO.	POR/CODE/TAG NO
23		STRAIGHT TEE X-S 2" B.W SML'S Black	500	21935	21935	

CHEMICAL COMPOSITION(%)(L : LADLE P : PRODUCT)																								
STD.	SPEC.	C	Si	Mn	P	S	Ni	Cr	Mo	Cu	V	Nb	N	Al	B	W	Sn	Ti	C-E	TENSILE TEST				
																				Y.S	T.S	EL.	RA	
	MIN	0.10	0.29																		35.0	60.0	25.5	
	MAX	0.30	1.06	0.050	0.050	0.050	0.40	0.40	0.15	0.40	0.08										MIN	85.0		
21935	L	0.17	0.23	0.66	0.010	0.001	0.03	0.03	0.04	0.03	0.001										MAX	42.3	73.4	41.0
	P																							
	L																							
	P																							

IMPACT TEST	HEAT NO.	TEST TEMP.	SIZE OF SPECIMEN(mm)	ABSORBED ENERGY		LATERAL EXPANSION		PERCENT SHEAR		HARDNESS		HEAT TREATMENT	
				STD./	VALUE	STD./	VALUE	STD./	VALUE	MIN	MAX	N.D.E	N.I.A
	21935		B/M H.A.Z W/M B/M H.A.Z W/M							HB	197	146	N.I.A N.I.A N.I.A N.I.A N.I.A N.I.A

- MANUFACTURED IN ACCOR. TO DIN 50049.3.1 & MEET NACE MR0103-2003 STANDARD SPEC.

WE CERTIFY THIS MATERIAL HAS BEEN MANUFACTURED AND EXAMINED IN ACCORDANCE WITH ALL REQUIREMENTS OF THE SPECIFICATION AND THE RESULTS OF ALL EXAMINATION ARE ACCEPTABLE.

**RUSHTON GAS & OIL EQUIP. LTD.**  
 MTR CONFORM TO:  
 ASME SEC. II-A ED. 07 ADD.07

QA: *[Signature]*  
 DATE: April 14/10

QM DIV. SENIOR MANAGING DIRECTOR

CE = 0.297  
 Mn/C = 3.8  
 C + Mn/4 = 0.33  
 C + Mn/6 = 0.28

SKE-9903

1175283

# MATERIAL TEST & INSPECTION CERTIFICATE

**SUNGKWANG BEND CO., LTD. (SKB)**  
 1720, Songjeong-Dong, Gangseo-Ku, Busan, Korea  
 TEL : 82-051-3300-450  
 FAX : 82-051-3300-335  
 http://www.sk bend.com

CUSTOMER: ALLIED FITTINGS  
 PROJECT NAME: N/A  
 According to  
 DIN 50049 3.1 / EN 10204 3.1 / ISO 10474 3.1  
 PO 20551- C3168 PFW April 13/10

PURCHASE ORDER NO.	275084-JD	CERTIFICATE NO.	QCL2008110400
PJT JOB NO.	N/A	DATE OF ISSUE	2008.10.30
STARTING MATERIAL	SEAMLESS PIPE	VISUAL & DIMENSION	SATISFACTORY
NO.	SEQ/LINE/ITEM NO	DESCRIPTION	QTY
28		STRAIGHT TEE X-S	600
		B.W SML'S	Black
		HEAT NO.	21937
		MFG ID NO.	21937
		MILL MAKER	Tenaris
		POR/CODE/TAG NO	

STD.	SPECC	C	Si	Mn	P	S	Ni	Cr	Mo	Cu	V	Nb	N	Al	B	W	Sn	Ti	C.E	SPEC.	TENSILE TEST		
																					Y.S	T.S	EL.
HEAT NO.	MIN	0.30	0.10	0.29																MIN	KSI	%	
	MAX	0.16	0.24	1.06	0.050	0.058	0.40	0.40	0.15	0.40	0.08	0.03	0.03	0.001	0.40	0.29	44.2	85.0	71.6	MAX	KSI	%	
	L			0.65	0.011	0.001	0.02	0.04	0.03	0.03	0.001												
	P																						
	L																						
	P																						

IMPACT TEST	HEAT NO.	SIZE OF SPECIMEN(mm)	ABSORBED ENERGY		LATERAL EXPANSION		PERCENT SHEAR		HARDNESS		HEAT TREATMENT	M.T.GOOD	PHI	N/A
			VALUE	AVE.	VALUE	AVE.	MIN	MAX						
	21937	BIM									N.D.E	N/A		**MEMO
		H.A.Z									FLATTENING TEST	N/A		
		WIM									BENDING TEST	N/A		
		BIM									HYDROSTATIC TEST	N/A		
		H.A.Z									CORROSION TEST	N/A		
		WIM									GRAIN SIZE TEST	N/A		
											HIC TEST	N/A		

MANUFACTURED IN ACCOR. TO DIN 50049-3.1 & MEET NACE MR0103-2003 STANDARD SPEC.  
 RUSHTON GAS & OIL EQUIP. LTD.  
 WE CERTIFY THIS MATERIAL HAS BEEN MANUFACTURED AND EXAMINED IN ACCORDANCE WITH ALL MTR CONFORM REQUIREMENTS OF THE SPECIFICATION AND THE RESULTS OF ALL EXAMINATION ARE ACCEPTABLE.  
 ASME SEC. II-A ED. 07 ADD: 09  
 QA: DE  
 DATE: April 14/10  
 CE: 0.286  
 Mn/Cs: 4.1  
 Mn/A: 0.32  
 C: 0.16

*W. H. Sak*  
 QM DIV. SENIOR MANAGING DIRECTOR

REVIEWED BY :  
 WITNESSED BY :

P.O. 2551 - C3168 PPW Apr 13, 10

CERTIFICATO DI COLLAUDO SECONDO EN 10204 - 3.1 INSPECTION CERTIFICATE

GLOBAL GAEL SERVICE LTD		Certif. N. 853	Del/Dated 03.03.2010
Unit 1E, Block 71, The Plaza Nangor Road DUBLIN 12		Fattura / Invoice N. 610	Del/Dated 02.03.2010
		Ns.Ord. / Our ref. N.	Del/Dated 02.03.2010

COMPANY WITH QUALITY MANAGEMENT SYSTEM CERTIFIED BY DNV = ISO 9001 : 2000 =

SEDE AMMINISTRATIVA E STABILIMENTO: 23861 CESANA BRIANZA (LC) - Italy Via G. Parni, 28 Tel. +39 031.655441 Fax +39 031.655149 quality.mff@farmas.com

**METALFAR** PRODOTTI INDUSTRIALI S.P.A. SALVA PROVE E ANALISI MATERIALI / MATERIAL TEST DEPARTMENT Certificato generato da un sistema informatico secondo la norma EN10204, valido senza firma / This certificate has been generated by computer and need not be signed for validity acc. to EN10204

COD. COL. HEAT	09/79462	VS. ORDINE YOUR REFERENCE	513*SS*/FR	Q.TA' DESCRIPTION	WIN 150 RF 2" XS	A105	DIM. IN ACC. A DIM. ACCORDANCE TO ASME/ANSI B16.5		VISIVO E DIMENS. VIS. & DIMENS. SATISFACTORY																												
MATERIALE / MATERIAL	ASTM A105	C%	0,195	S%	0,250	Mn%	0,980	P%	0,014	Cr%	0,070	Mo%	0,010	Ni%	0,050	Nb%	0,001	V%	0,001	Cu%	0,120	Ti%	0,009	TP%	0,009	Cj%	0,120	Cv%	0,001	N%	0,000	Al%	0,030	C.E.-%	0,386	B %	0,000
PROVETTA / TEST SPECIMEN	SEZ. mm2 126,60	SNERVAMENTO YIELD POINT N/mm2 >=0,2%	334,0	ROTTURA TENSILE STRENGTH N/mm2 >=	539,0	ALLUNGAMENTO ELONGATION %>=	33,0	CONTRAZIONE REDUCTION OF AREA %>=	58,0	DUREZZA HARDNESS HB	163,0 - 165,0	RESILLENZA / IMPACT TEST - JOULE/cm2	TIPO / TYPE 10x10mm	KV	20	88	90	83	SNERVAMENTO YIELD POINT N/mm2 >=1,0%	0,0																	

MATERIALE IN ACCORDO A / MATERIAL IN ACC. TO	ASTM/ASME A 105/SA 105 M - 05	CSA CAN3 Z-245.12-05	GRADE 248 CAT. I	TRATTAMENTO TERMICO / HEAT TREATMENT	NORMALIZED AT 920 C - COOLED IN STILL AIR	ORIGINE / ORIGIN	EUROPE																														
COD. COL. HEAT	09/79460	VS. ORDINE YOUR REFERENCE	513*SS*/FR	Q.TA' DESCRIPTION	WIN 150 RF 2" XS	A105	DIM. IN ACC. A DIM. ACCORDANCE TO ASME/ANSI B16.5		VISIVO E DIMENS. VIS. & DIMENS. SATISFACTORY																												
MATERIALE / MATERIAL	ASTM A105	C%	0,195	S%	0,210	Mn%	1,010	P%	0,008	Cr%	0,012	Ni%	0,050	Mo%	0,010	Nb%	0,001	V%	0,001	Cu%	0,160	Ti%	0,009	TP%	0,009	Cj%	0,160	Cv%	0,001	N%	0,002	Al%	0,024	C.E.-%	0,398	B %	0,000
PROVETTA / TEST SPECIMEN	SEZ. mm2 126,60	SNERVAMENTO YIELD POINT N/mm2 >=0,2%	333,0	ROTTURA TENSILE STRENGTH N/mm2 >=	536,0	ALLUNGAMENTO ELONGATION %>=	31,0	CONTRAZIONE REDUCTION OF AREA %>=	58,0	DUREZZA HARDNESS HB	156,0 - 159,0	RESILLENZA / IMPACT TEST - JOULE/cm2	TIPO / TYPE 10x10mm	KV	20	84	86	82	SNERVAMENTO YIELD POINT N/mm2 >=1,0%	0,0																	

MATERIALE IN ACCORDO A / MATERIAL IN ACC. TO	ASTM/ASME A 105/SA 105 M - 05	CSA CAN3 Z-245.12-05	GRADE 248 CAT. I	TRATTAMENTO TERMICO / HEAT TREATMENT	NORMALIZED AT 920 C - COOLED IN STILL AIR	ORIGINE / ORIGIN	EUROPE																														
COD. COL. HEAT	09/35534	VS. ORDINE YOUR REFERENCE	513*SS*/FR	Q.TA' DESCRIPTION	WIN 300 RF 3" STD	A105	DIM. IN ACC. A DIM. ACCORDANCE TO ASME/ANSI B16.5		VISIVO E DIMENS. VIS. & DIMENS. SATISFACTORY																												
MATERIALE / MATERIAL	ASTM A105	C%	0,195	S%	0,250	Mn%	0,970	P%	0,014	Cr%	0,130	Ni%	0,070	Mo%	0,010	Nb%	0,002	V%	0,000	Cu%	0,170	Ti%	0,007	TP%	0,007	Cj%	0,170	Cv%	0,000	N%	0,002	Al%	0,006	C.E.-%	0,401	B %	0,000
PROVETTA / TEST SPECIMEN	SEZ. mm2 126,60	SNERVAMENTO YIELD POINT N/mm2 >=0,2%	342,0	ROTTURA TENSILE STRENGTH N/mm2 >=	523,0	ALLUNGAMENTO ELONGATION %>=	32,0	CONTRAZIONE REDUCTION OF AREA %>=	59,0	DUREZZA HARDNESS HB	159,0 - 163,0	RESILLENZA / IMPACT TEST - JOULE/cm2	TIPO / TYPE 10x10mm	KV	20	80	90	86	SNERVAMENTO YIELD POINT N/mm2 >=1,0%	0,0																	

NOTE	MATERIAL IN ACCORDANCE WITH NACE MR-0175/2003 ISO 15156 - SOUR SERVICE	MTR CONFORME	CONTROLLO QUALITA' QUALITY CONTROL DEPARTMENT	ENTE UFFICIALE DI COLLAUDO INSPECTION AUTHORITY	MARCHIO PRODUZIONE MANUFACTURER'S SYMBOL
NOTES	MATERIAL IN ACCORDANCE WITH NACE MR-0103/2007 - SOUR SERVICE	ASME SEC. I-A ED. 07	ADD: 07 S. Corti		MFF
	CE = 0,286	QA: [Signature]	DATE: Apr 7 14/10		
	Mn/C = 5,0				
	C + Mn / 4 = 0,44				
	C + Mn / 8 = 0,26				