

Quality Control Manual
For
Model MO.5-266B-VMT-000-CEP
S/N: CSN10488
Husky Energy Inc.
Project No: P0095

Crimtech Services Ltd.
#45, 27429 Township Road 374
Red Deer County, Alberta
T4S 2H4

Phone No. (403) 342-7579

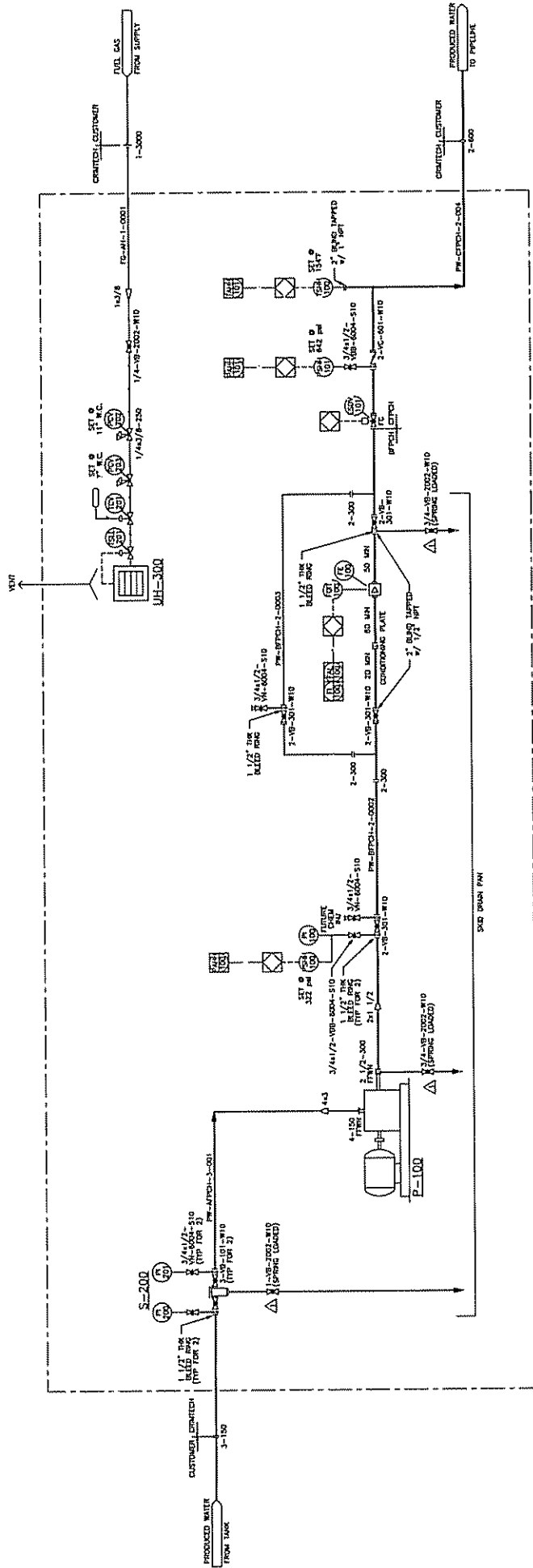
Fax. No. (403) 342-6929

S-200
BASKET STRAINER
1/2" NPT
1/2" NPT FOR DRAIN
C/F 1" NPT FOR DRAIN

P-100
WATER TRANSFER PUMP
1/2" NPT
1/2" NPT FOR DRAIN
FLOW RATE: 10000-100000 L/HOUR

UH-300
ENCLOSURE HEATER
1/2" NPT
1/2" NPT FOR DRAIN
MODEL HE 18 x 24

06-001-B
WATER TRANSFER SKID
1/2" NPT
1/2" NPT FOR DRAIN
PUMP STYLE B



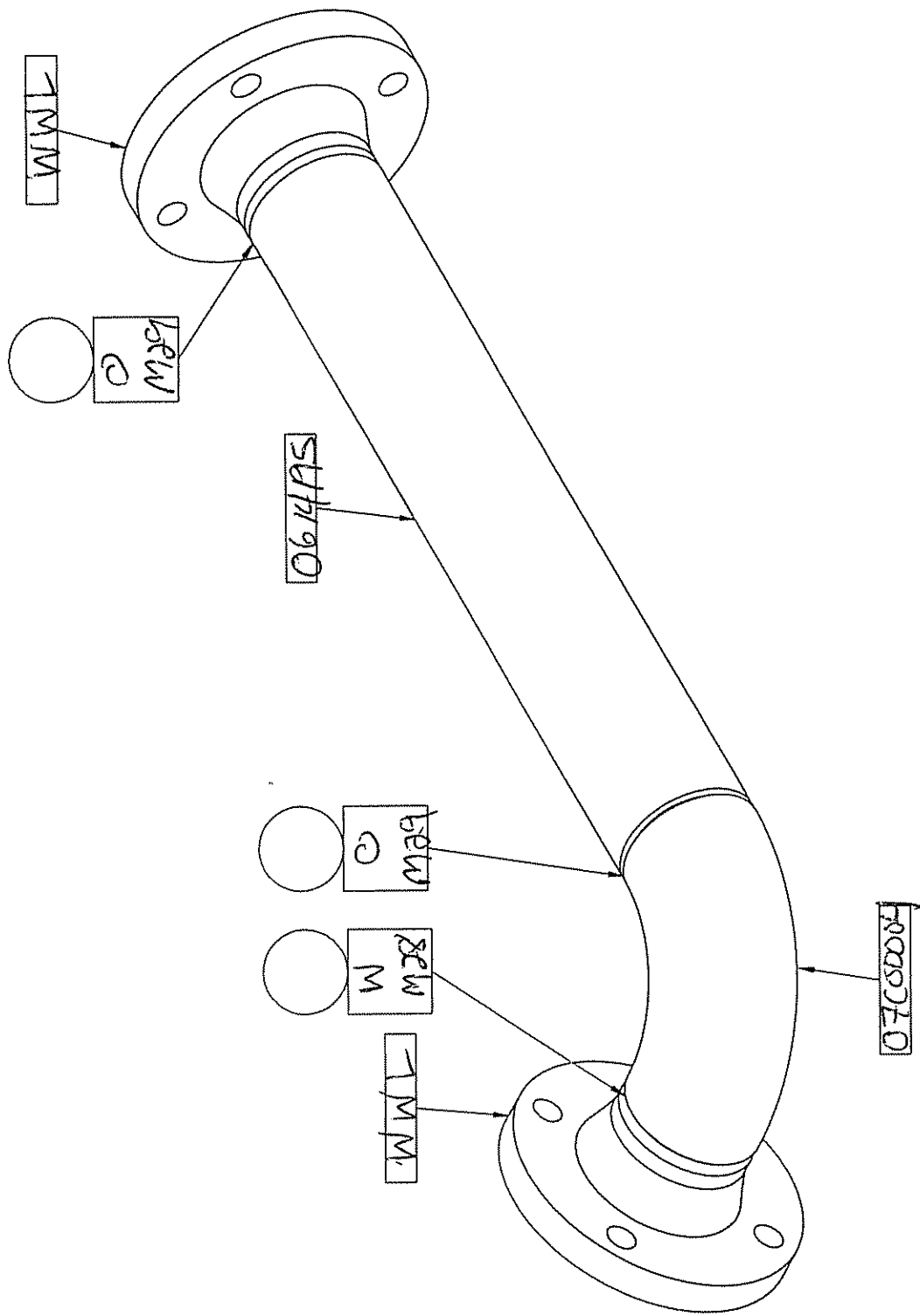
NO.	DATE	REVISION DESCRIPTION	BY	CHECKED	REVIEW STAGE	APPRO.	DATE
1	07 04 20	ISSUED FOR CLIENT APPROVAL	JMK		PROCESS		
2	07 05 04	ISSUED FOR CONSTRUCTION	JMK		MECHANICAL		
3	07 05 11	REVISED SPECIFICATION BROUAS	JMK		STRUCTURAL		
4					INSTRUMENT		
5					ELECTRICAL		
6					SHOP		
7					O.C.		
8					ESTIMATOR		

- NOTES:**
1. MAXIMUM INLET PRESSURE 250 PSIG, INLET DESIGNED TO 1400 PSIG.
 2. ALL INSTRUMENTS ARE VORTEX OUTSIDE.
 3. LINE DESIGNED TO MEET NIST PIPING SPECIFICATIONS AS SHOWN. EXCEPTS: NO LOW TEMP MATERIALS TO BE USED.
 4. SET PRESSURES EXCLUDING PSY'S TO BE FIELD SET.
 5. DRAIN LINES ARE TO BE CAPED FOR HYDROTEST, Δ

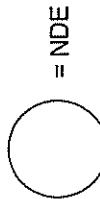
CRIMTECH
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REF: 1-800-813-8123
www.crimtech.com

CUSTOM WATER TRANSFER SYSTEM SKID	
MODEL NO. MD.S-250B-VAT-000-CEP	
PIPING AND INSTRUMENTATION DIAGRAM	
DESIGNED BY	JMK
CHECKED BY	TBD
DATE	10/14/21
PROJECT NO.	MF-P0093-01



WELD MAP LEGEND



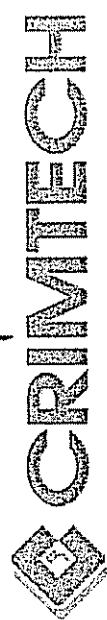
= NDE

= WELDER

= HEAT NUMBER

3" 150# RFWN SA-105N
3" 90 ELB STD SA-234-WPB
3" STD PIPE SA-106B

B-15 - Complete ✓



Services Ltd
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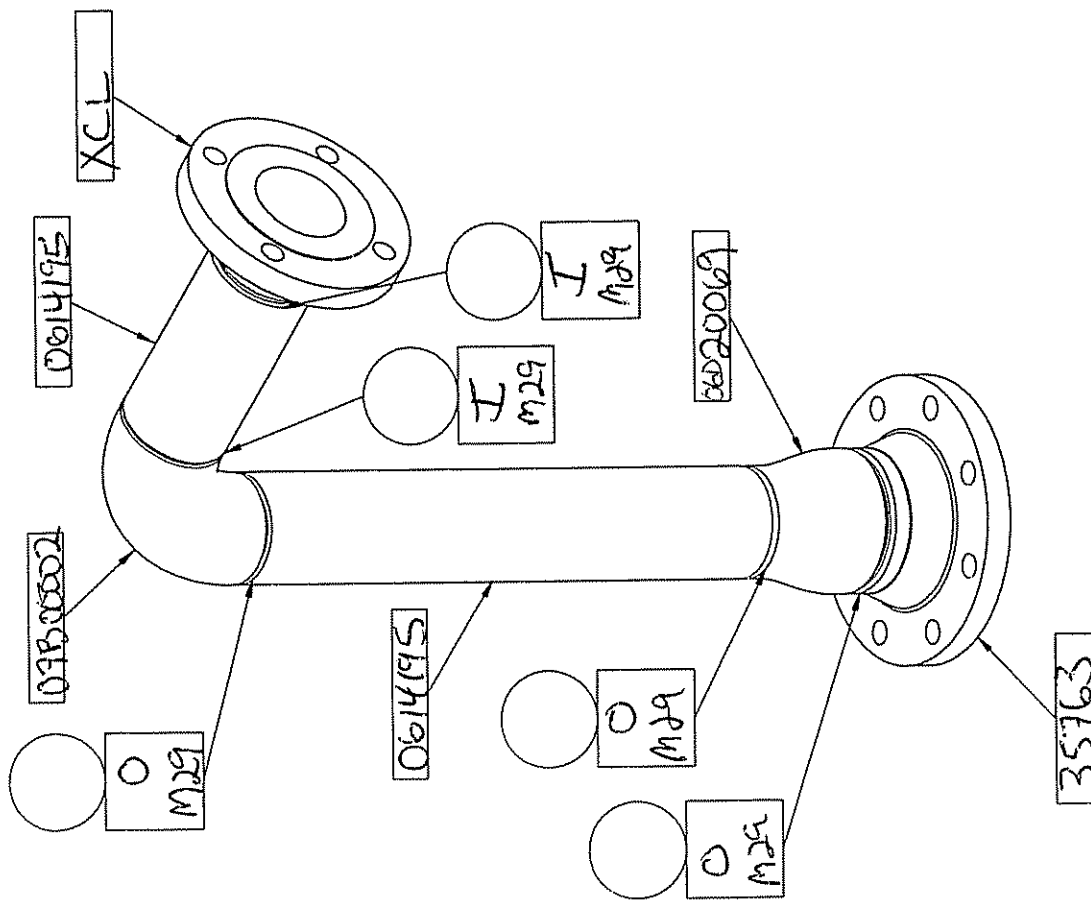
PH 1-800-993-9956

SPOOL NO.:

18006

DRAWING NO.:

1014871-WM-01A



WELD MAP LEGEND



= NDE



= WELDER



= HEAT NUMBER

- 3" 150# RFWN SA-105N
- 3" STD PIPE SA-106B
- 3" 90° ELB SA-234WPB
- 3" STD*4" STD CON.RED. SA-234WPB
- 4" 150# FFWN SA-105N



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PH 1-800-993-9958

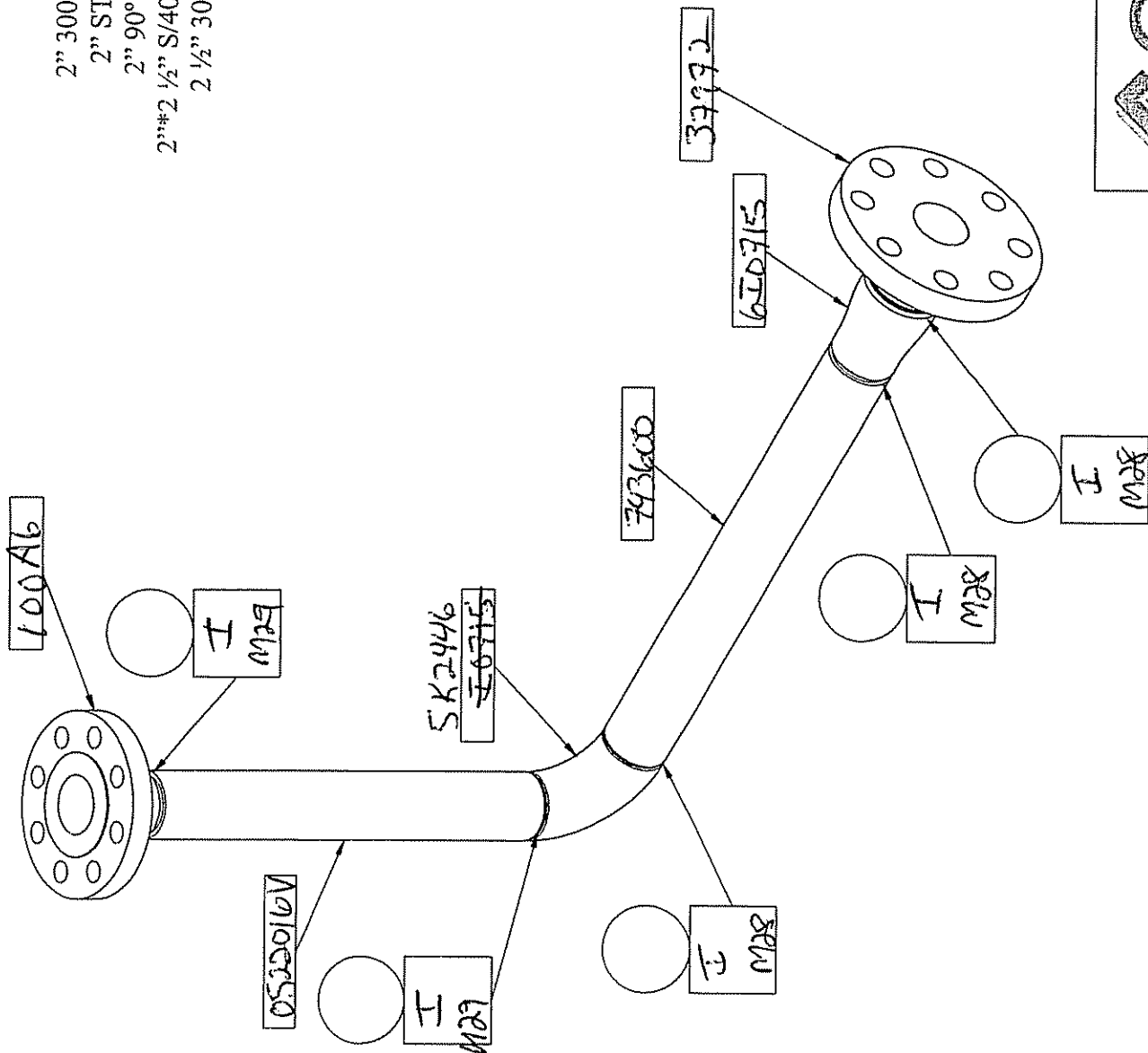
SPOOL NO.:

DRAWING NO.:

18007

1014871-WM-01B

- 2" 300# RFWN SA-105N
- 2" STD PIPE SA-106B
- 2" 90° ELB SA-234WPB
- 2"x2 1/2" S/40 CON.RED SA-234WPB
- 2 1/2" 300# FFWN SA-105N



WELD MAP LEGEND

- = NDE
- = WELDER
- = HEAT NUMBER



Services Ltd

PH 1-800-993-9958

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SPOOL NO.:

18056

DRAWING NO.:

1014871-WM-03A

WELD MAP LEGEND

○ = NDE

MON =

= WELDER

= WELDER

= HEAT NUMBER

1000

2" 300# RFWN SA-105N
2" STD PIPE SA-106B
2" STD TEE SA-234-WPB
2" 90 DEG ELB SA-234-WPB



TOULOUSE

Services Ltd

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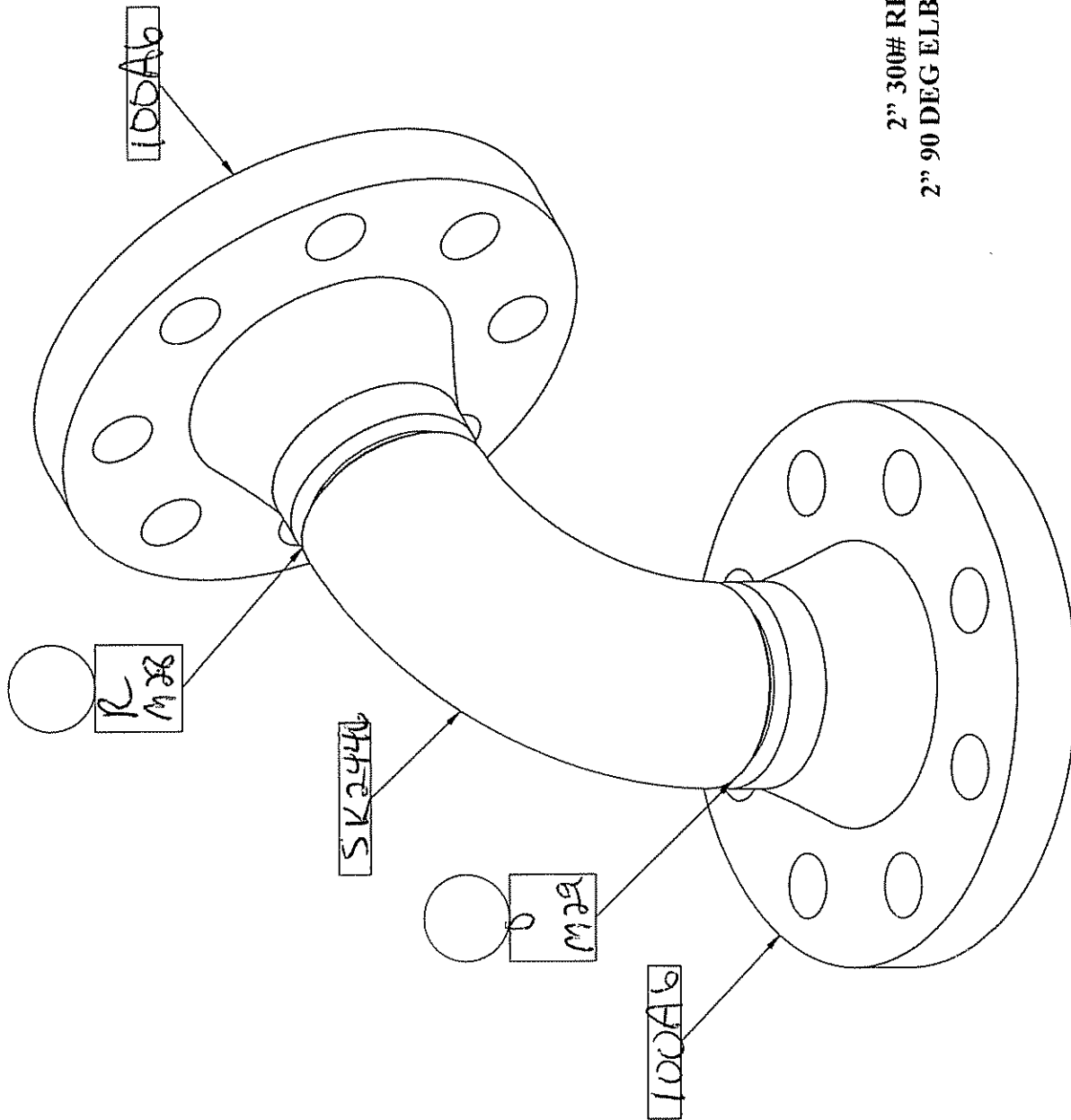
PH 1-800-993-9958

SPOOL NO.:

DRAWING NO.:

25081

1014871-WM-03B



2" 300# RFWN SA 105N
2" 90 DEG ELB SA234-WPB SCH 40

WELD MAP LEGEND



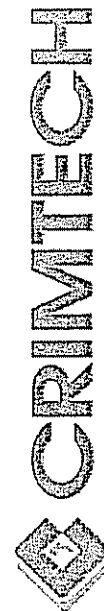
= NDE



= WELDER



= HEAT NUMBER



Services Ltd
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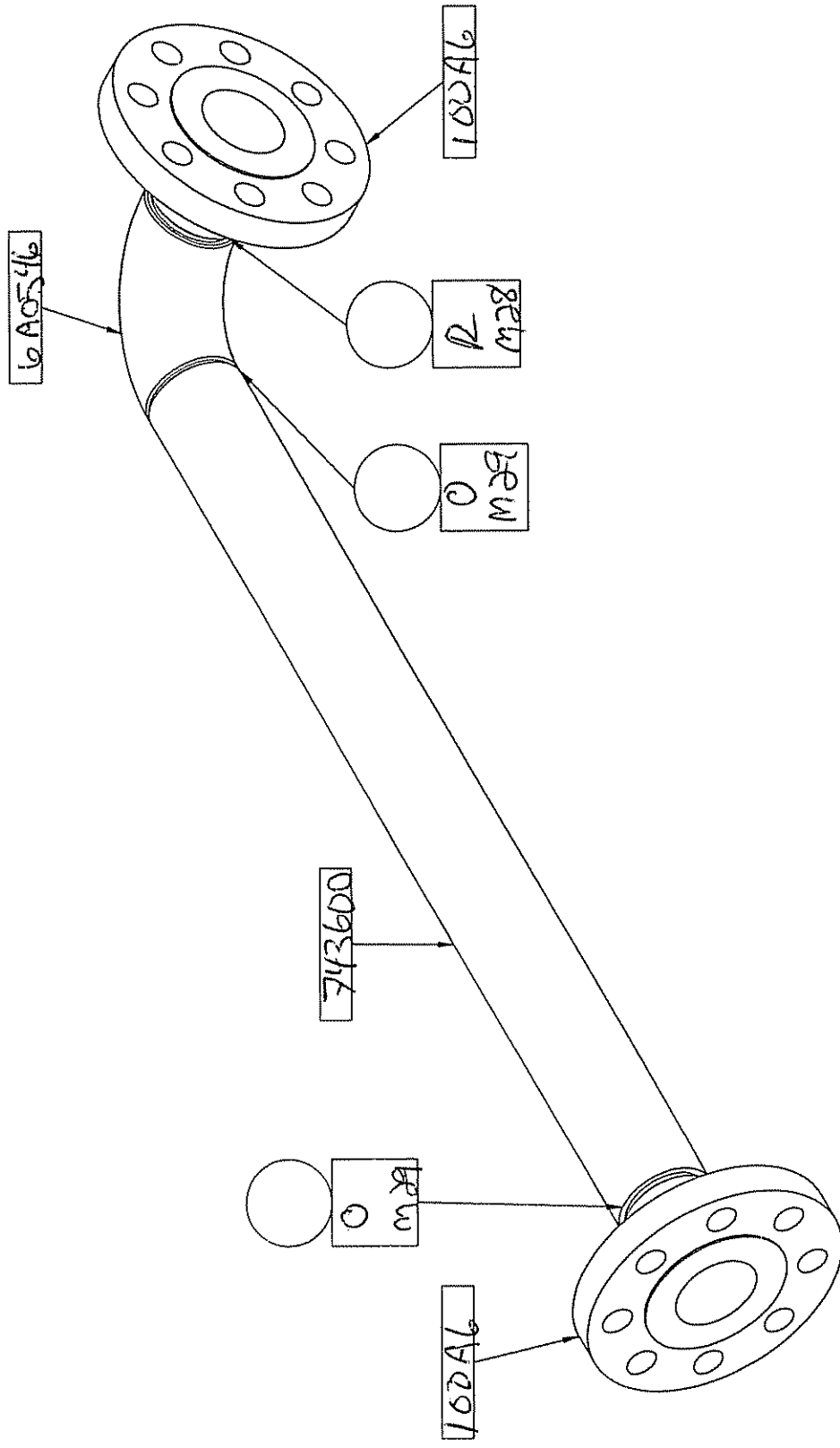
PH 1-800-993-9958

SPOOL NO.:

18058

DRAWING NO.:

1014871-WM-05A



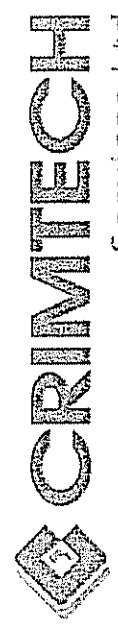
WELD MAP LEGEND

○ = NDE

□ = WELDER

▬ = HEAT NUMBER

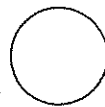
2" 300# RFWN STD SA-105N
 2" 90 DEG ELB STD SA-234-WPB
 2" STD SA-106B



PH 1-800-893-8958
 WWW.CRIMTECH.COM

DRAWING NO.: 1014871-WM-05B
 SPOOL NO.: 100546

WELD MAP LEGEND



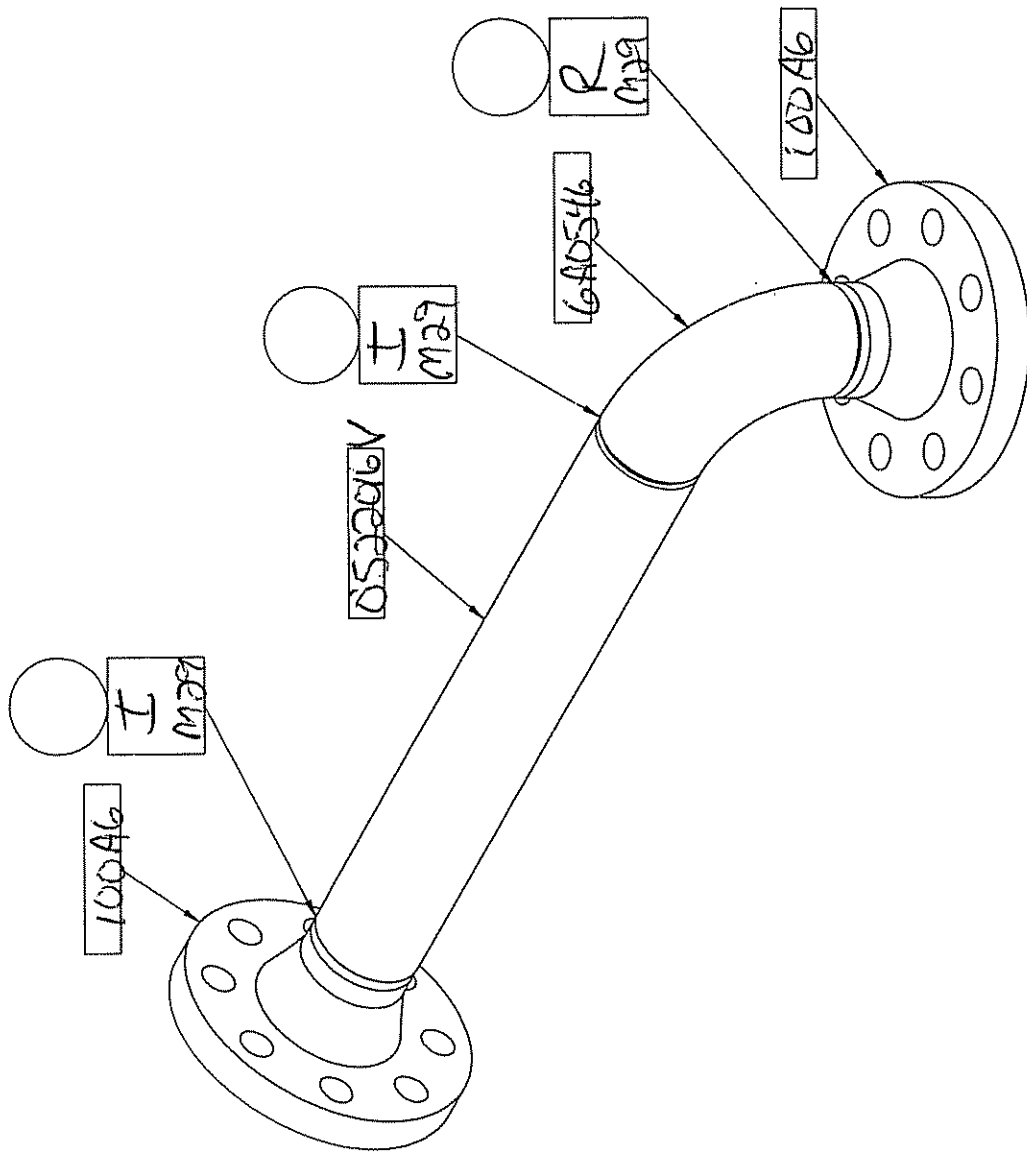
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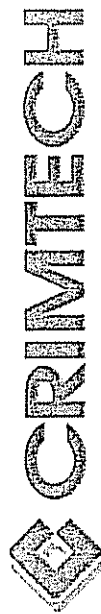
= WELDER



= HEAT NUMBER



2" 300# RFWN SA-105N
2" STD PIPE SA-106-B
2" STD 90 DEG ELB SA-234WPB



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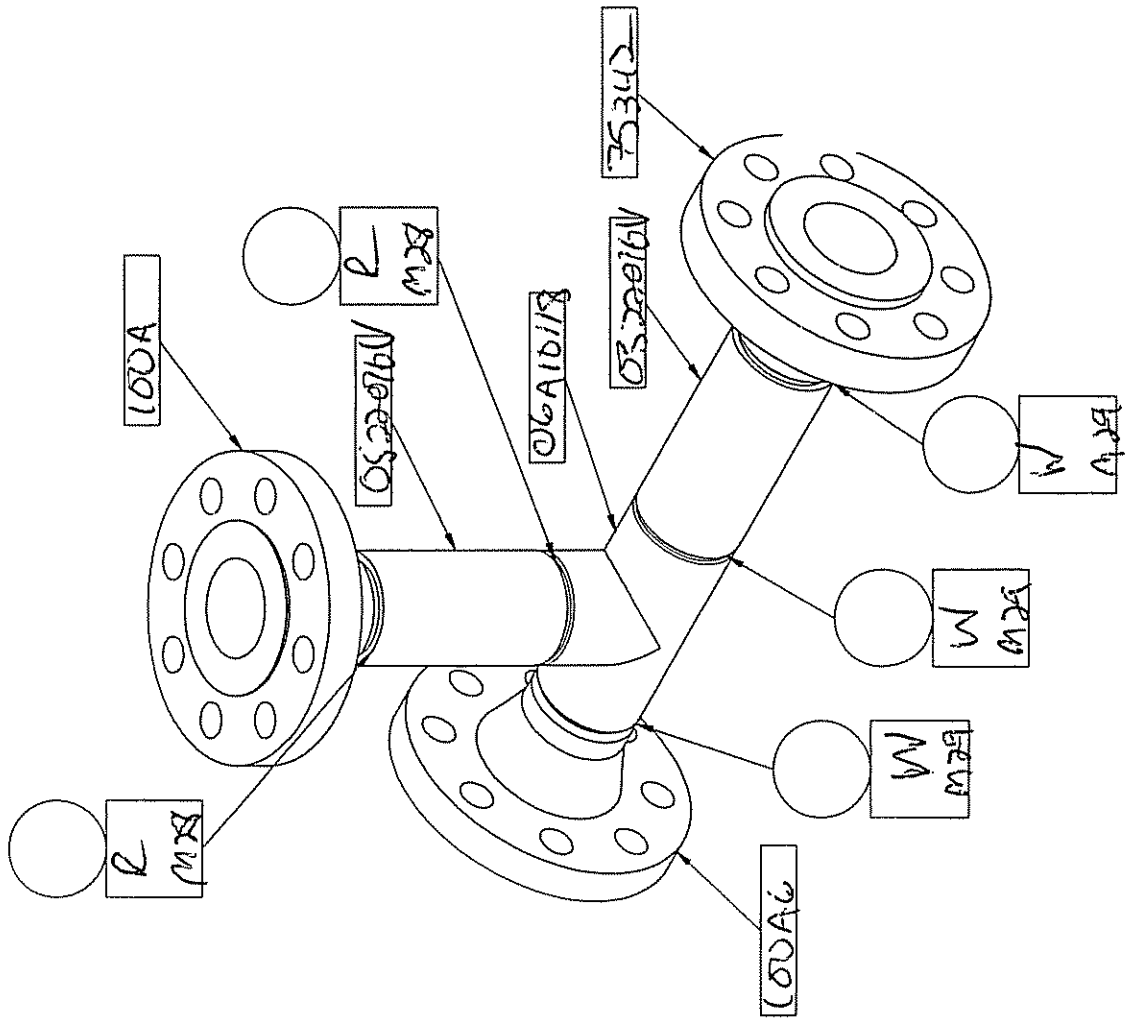
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SPOOL NO.:

18060

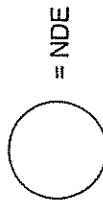
DRAWING NO.:

1014871-WM-05C



2" STD PIPE SA-106B
2" STD TEE SA-234WPB
2" 300# RFWN SA-105N
2" 600# RFWN SA-105N

WELD MAP LEGEND



= NDE



= WELDER



= HEAT NUMBER



CRIMTECH

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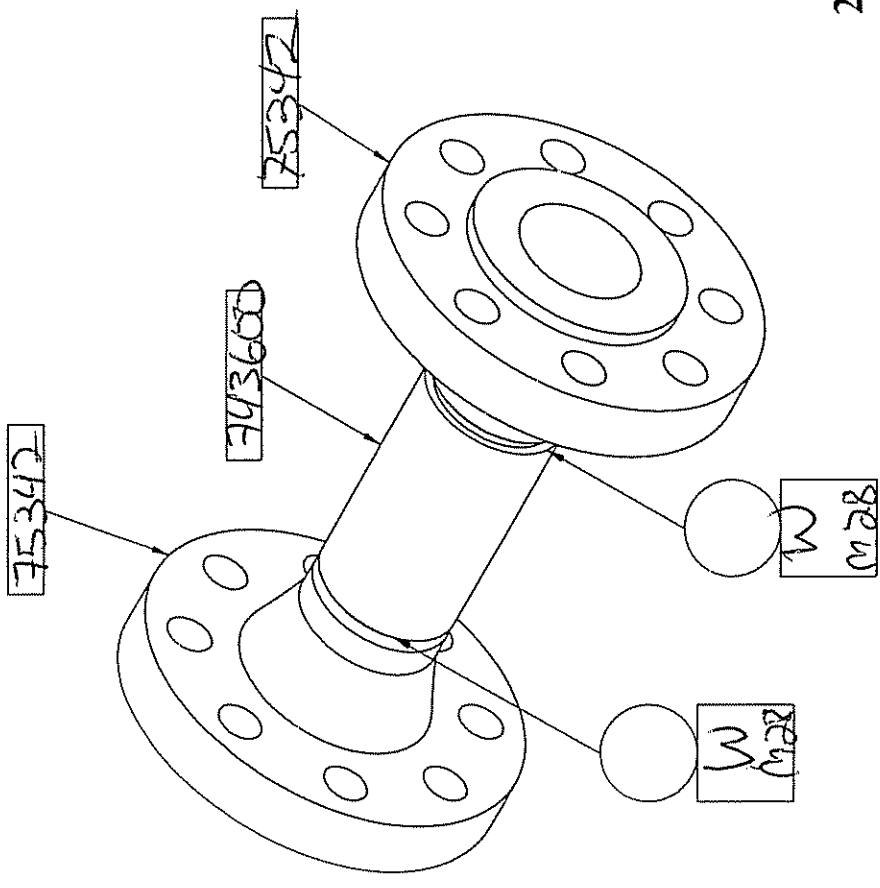
PH 1-800-993-9959

SPOOL NO.:

DRAWING NO.:

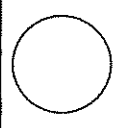
18061

1014871-WM-06A

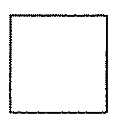


2"600# RFWN SA-105N
2" STD PIPE SA-106B

WELD MAP LEGEND



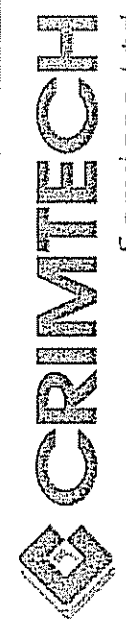
= NDE



= WELDER



= HEAT NUMBER



Services Ltd
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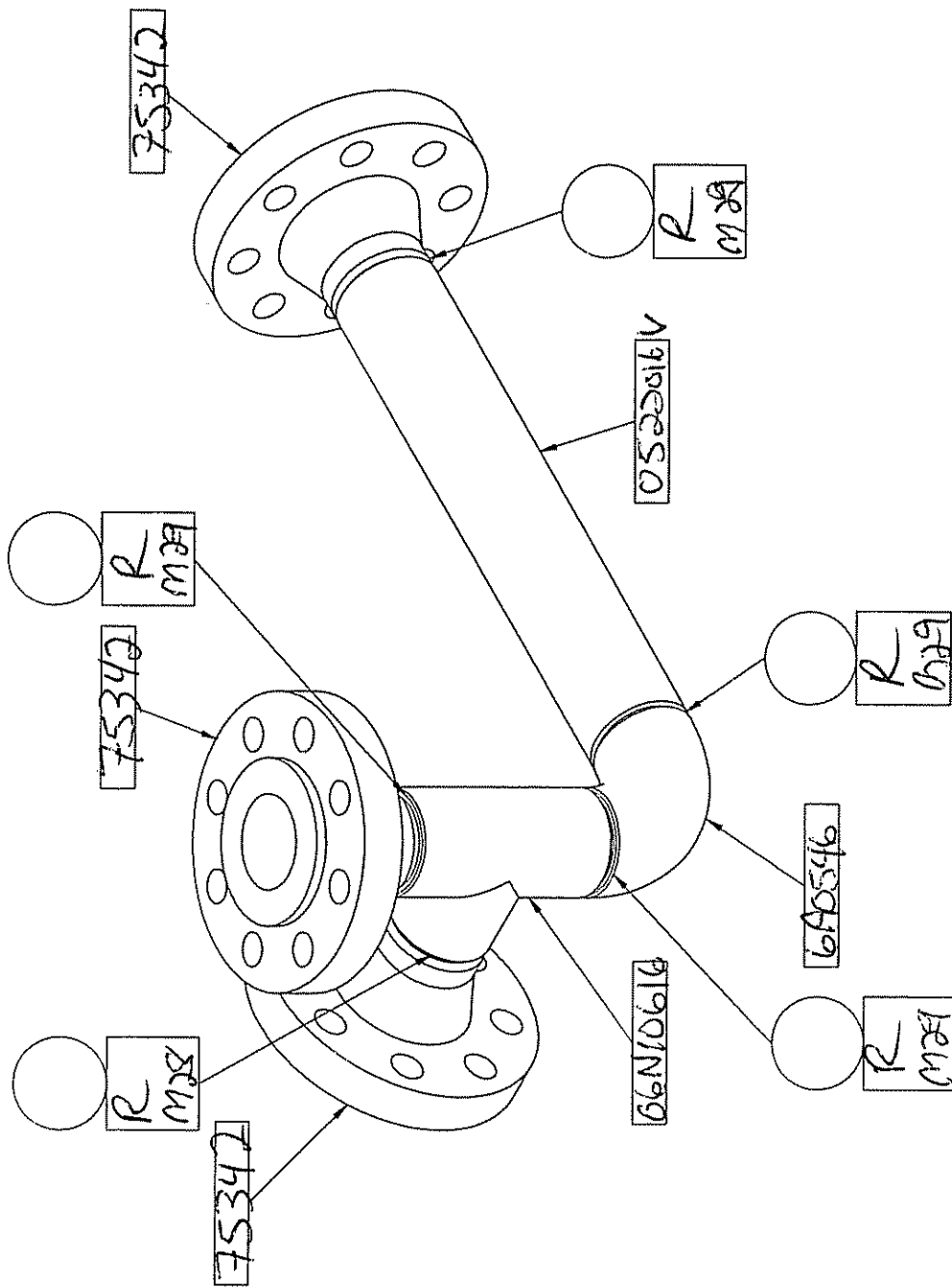
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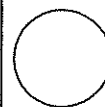
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1014871-WM-06B



WELD MAP LEGEND



= NDE

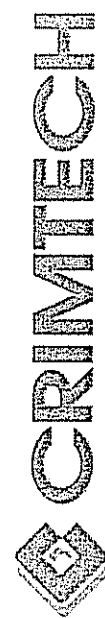


= WELDER



= HEAT NUMBER

2" 600# RFWN SA 105N
2" STD PIPE SA-106B
2" STD 90 DEG ELB SA-234-WPB
2" STD TEE SA-234-WPB



Services Ltd

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PH 1-800-993-9959

SPOOL NO.:

18127

DRAWING NO.:

1014871-WM-06C

CRIMTECH SERVICES LTD.
PNEUMATIC TEST REPORT



CSN 10488

Client: Husky Energy Inc.. Date: July 5, 2007
Project: P0095
Description of Product: Fuel gas piping as per draeing 1014871-PS-09 Rev.1

Test Medium: Air/ Nitrogen
Test Pressure: 165 psi
Hold Time at Test Pressure: 15 minutes minimum

Crimtech Quality Control Inspector: 

Client Representative: 

Comments: All connections were sprayed with a water/soap solution. There were no visible leaks at time of test. All functions correct.

Leak Test Report

Preformed by:	Crimtech Services Ltd.	Date:	June 1, 2007
Project Name:	Water Transfer systems	Location of Installation:	Unknown
Design Code :	CSA Z662	Test Pressure :	428 psi
Gauge SN:	CT-1000	Chart Recorder SN:	202EC-883847
Test Start Time	AM PM	Test finish Time	AM PM

Description of tested items:

Work order Number: 310359

Spool Serial Numbers:

18009
18011
18005
18013
18003
18001
18007
18012
18008
18010
18006
18000
18002
18004

Batch 9-15

Crimtech QC
representative
Client
representative

K. Conway

Signature

K. Conway

Date

June 1/07

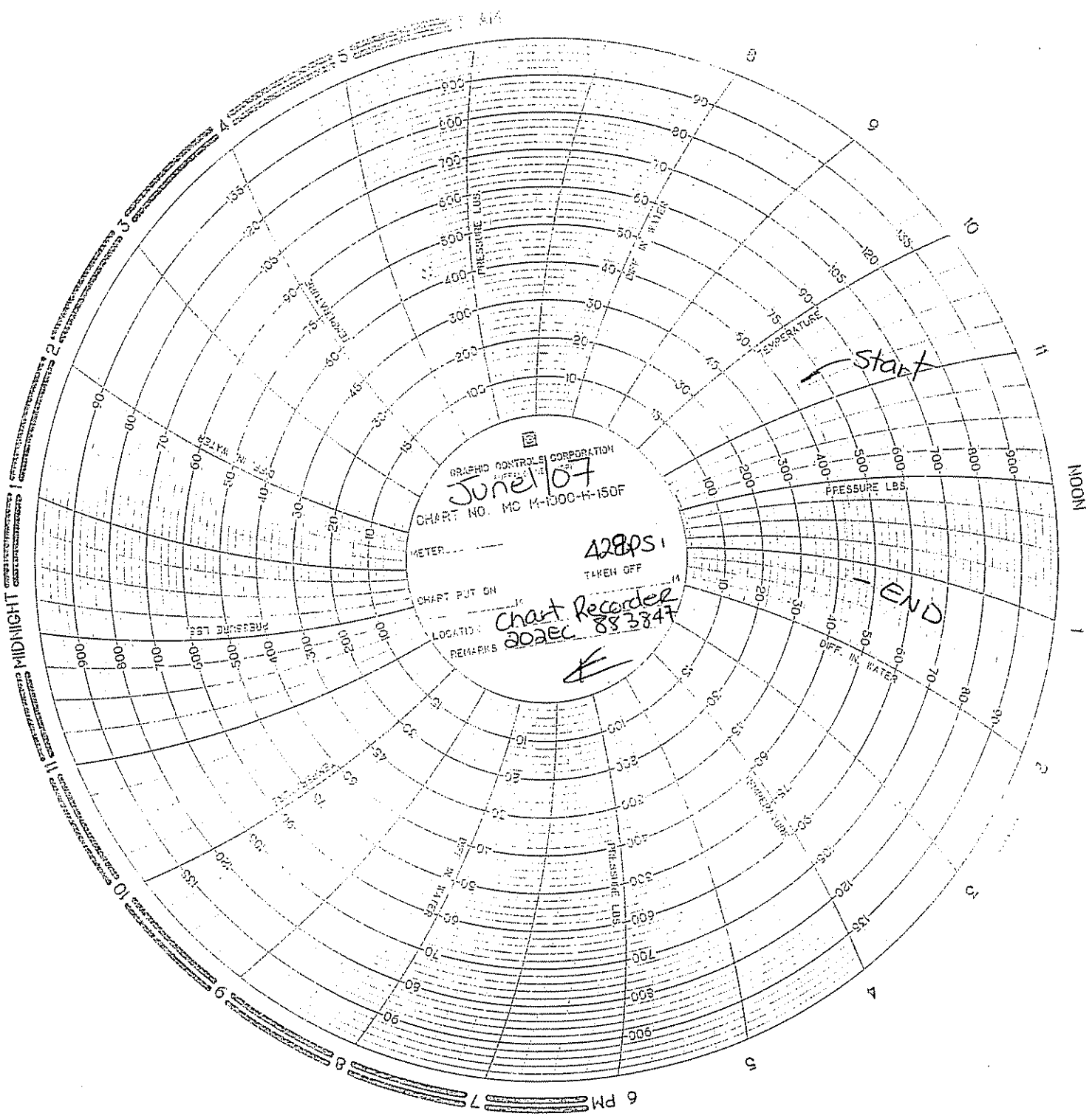
K. Fumyus

Signature

[Signature]

Date

June 1/07



GRAPHIC CONTROLS CORPORATION
June 10 07
CHART NO. MC M-1000-H-150F

428PSI
TAKEN OFF

CHART PUT ON
Chart Recorder
883847
REMARKS

Start

END

NOON

6 PM

Leak Test Report

Performed by:	Crimtech Services Ltd.	Date:	June 1, 2007
Project Name:	Water Transfer systems	Location of Installation:	Unknown
Design Code :	CSA Z662	Test Pressure :	1079 psi
Gauge SN:	203041-2-1 / 203041-2-3	Chart Recorder SN:	202E-160920
Test Start Time	AM PM	Test finish Time	AM PM

Description of tested items:

Work order Number: 310359

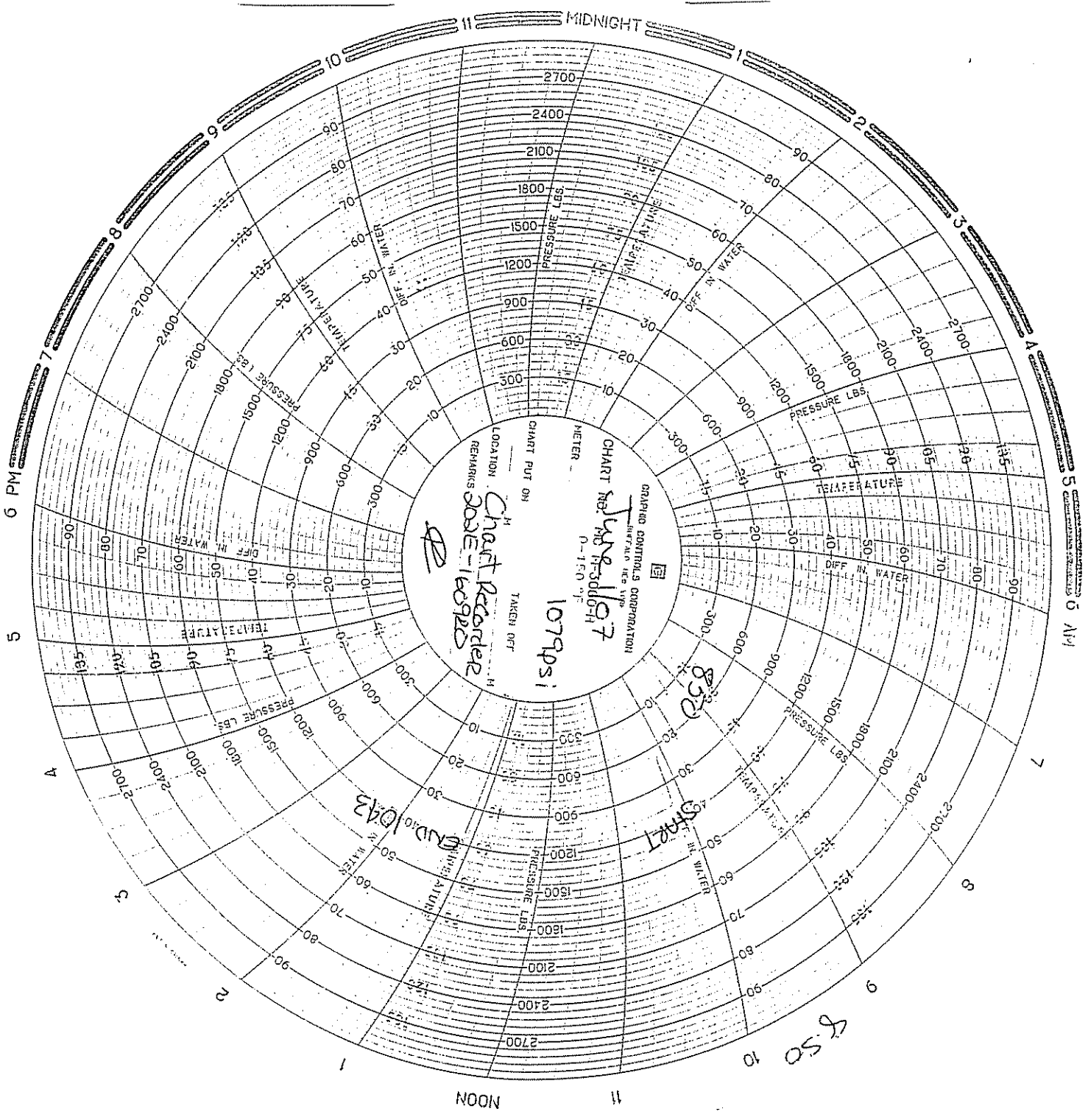
Spool Serial Numbers:

18076	18051
18073	18055
18074	18050
18068	18062
18075	18053
18063	18059
18038	18043
18044	18057
18046	18042
18071	18045
18072	18040
18078	18039
18079	18060
18054	18058
18065	18047
18077	18041
18069	18049
18067	18048
18070	18052
18066	18061
18064	18056

Batch 9-15

Crimtech QC
representative
Client
representative

<u>K Conroy</u>	Signature	<u>Kyle Conroy</u>	Date	<u>June 1/07</u>
<u>K. FUNDYLLIS</u>	Signature	<u>[Signature]</u>	Date	<u>June 1/07</u>



Leak Test Report

Performed by:	Crimtech Services Ltd.	Date:	June 1 2007
Project Name:	Water Transfer systems	Location of Installation:	Unknown
Design Code :	CSA Z662	Test Pressure :	2160 psi
Gauge SN:	E 4386	Chart Recorder SN:	QCE - 032838
Test Start Time	AM PM	Test finish Time	AM PM

Description of tested items:

Work order Number: 310359

Spool Serial Numbers:

18133
18132
18125
18125
18128
18123
18122
18126
18129
18124
18131
18127
18120
18130

Batch 9-15

Crimtech QC
representative
Client
representative

K. Conroy

Signature

Kyle Conroy

Date

June 1/07

K. Fendytk

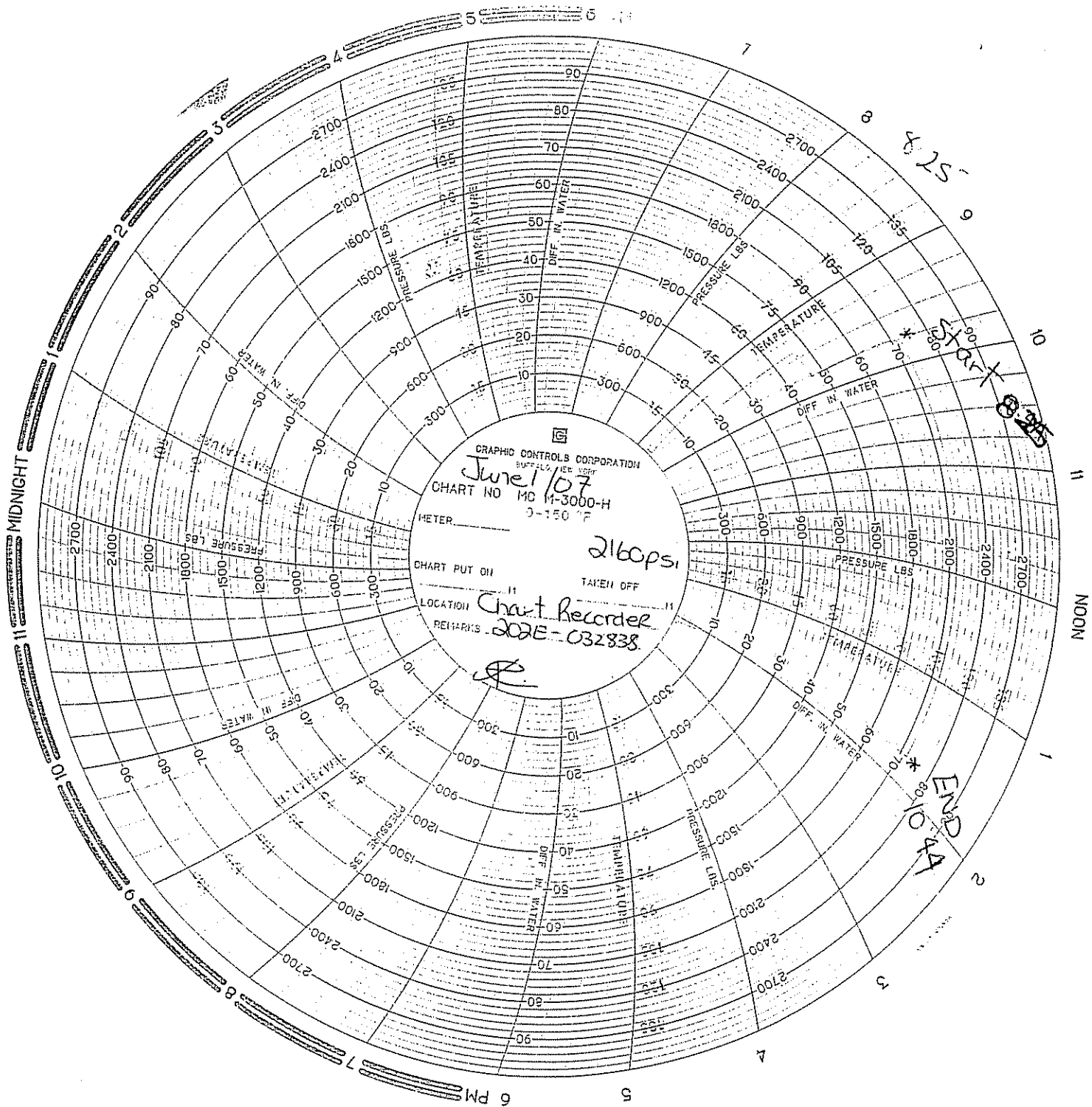
Signature

[Signature]

Date

June 1/07

CSA - 10083 - 10188



GRAPHIC CONTROLS CORPORATION
BUFFALO, NEW YORK
June 107
CHART NO MC 1-3000-H
0-150 °F

METER _____

CHART PUT ON _____

TAKEN OFF _____

LOCATION _____

REMARKS Chart Recorder
202E-032838

[Signature]

2160 psi

825

* 80
START

* 80
END

Leak Test Report

Performed by:	Crimtech Services Ltd.	Date:	June 14, 2007
Project Name:	Water Transfer systems	Location of Installation:	Unknown
Design Code :	CSA Z662	Test Pressure :	428 psi
Gauge SN:	CT-1001	Chart Recorder SN:	202EC 883847
Test Start Time	AM PM	Test finish Time	AM PM

Description of tested items:

Work order Number: Piping as per drawings 1014871-PS-02 Rev. 1

Batch 1 – 15/ CSN10474 - CSN10488

Crimtech QC
representative
Client
representative

K. Conroy

Signature

Kyle Conroy

Date

June 14/07

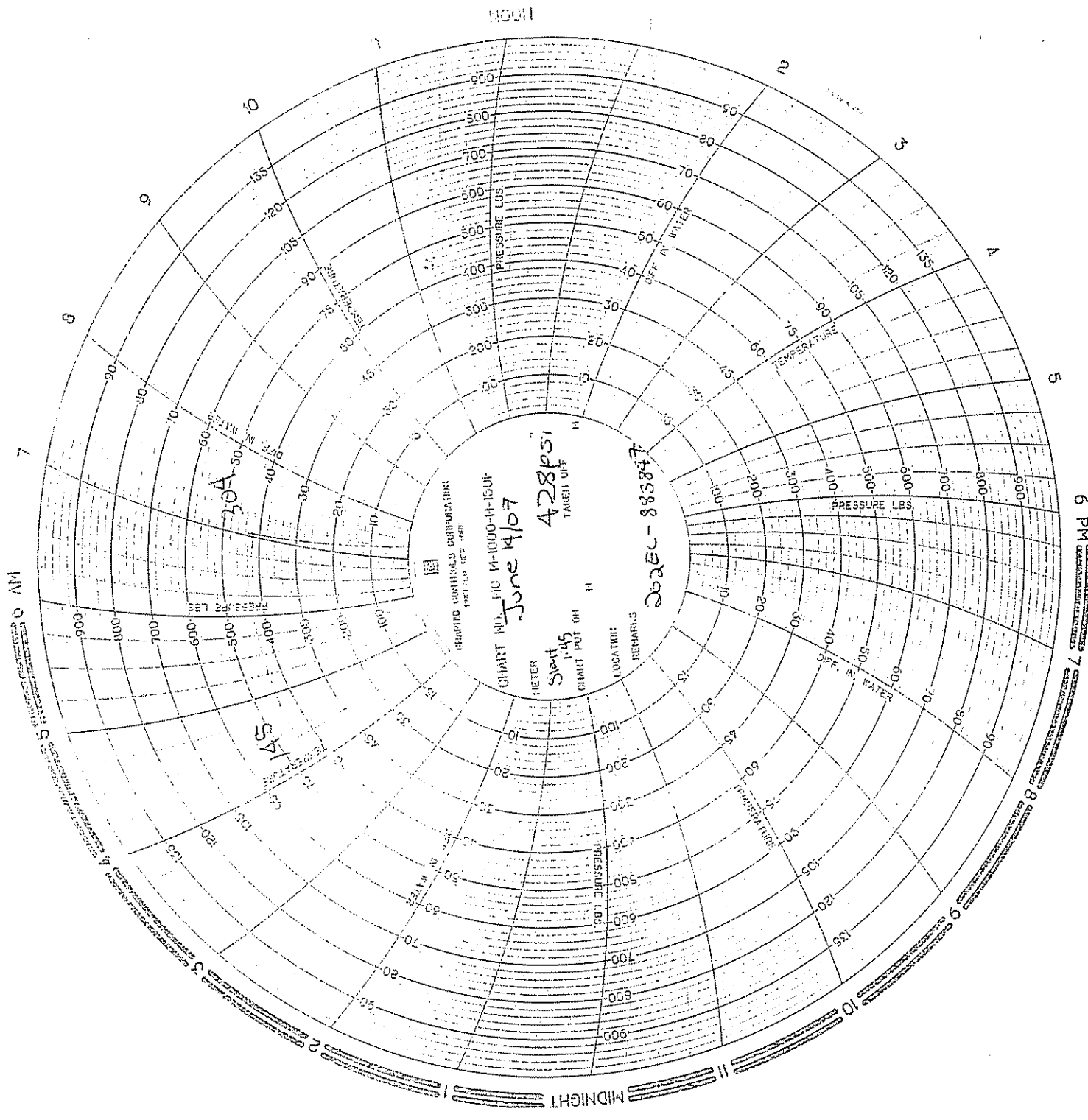
KEVIN FUNDYTLIS

Signature

[Signature]

Date

June 14/07



GRAPHIC CORPORATION
PITTSBURGH, PA.

CHART NO. MC 14-1000-H-150F

June 14/07

428 p.m.

TAKEN OFF

METER

Start

1.45

CHART PUT ON

LOCATION

REMARKS

30A-50

6 PM

MIDNIGHT

Leak Test Report

Performed by:	Crimtech Services Ltd.	Date:	July 4, 2007
Project Name:	Water Transfer systems	Location of Installation:	Unknown
Design Code :	CSA Z662	Test Pressure :	1079 psi
Gauge SN:	203041-2-1	Chart Recorder SN:	202E 032838
Test Start Time	8:30 AM	Test finish Time	12:30 AM

Description of tested items:

Work order Number: Piping as per drawings 1014871-PS-04 Rev. 2

Batch 1 – 15/ CSN10474 - CSN10488

Crimtech QC
representative
Client
representative

Kyla Conroy

Signature

Kyla Conroy

Date

July 4, 2007

K. Funnitus

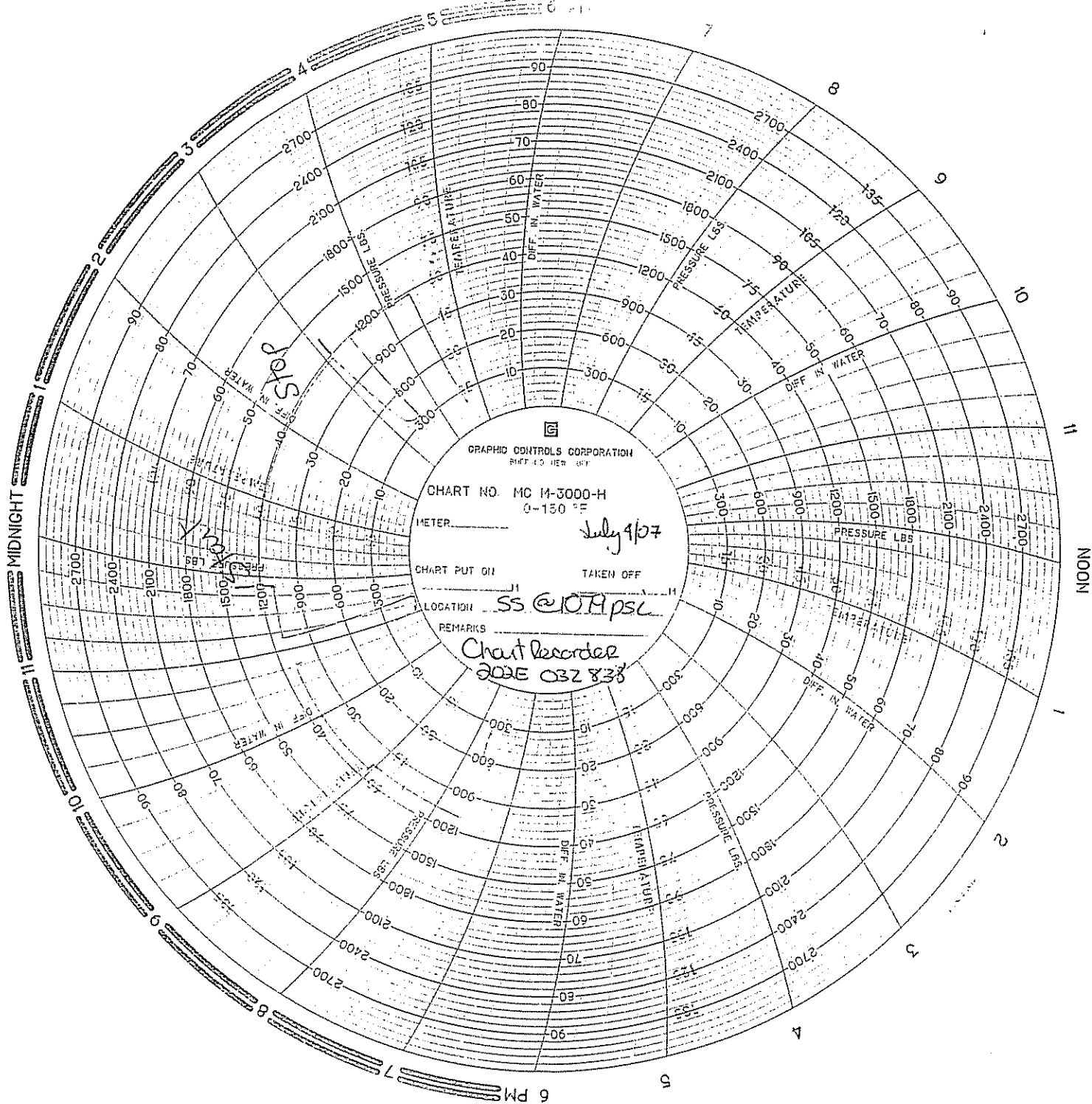
Signature

[Signature]

Date

July 4, 2007

CSN-10474-10488



Leak Test Report

Performed by:	Crimtech Services Ltd.	Date:	June 14, 2007
Project Name:	Water Transfer systems	Location of Installation:	Unknown
Design Code :	CSA Z662	Test Pressure :	1079 psi
Gauge SN:	203041-2-3	Chart Recorder SN:	202E 160920
Test Start Time	AM PM	Test finish Time	AM PM

Description of tested items:

Work order Number: Piping as per drawings 1014871-PS-07 Rev. 1 & 104871-PS-08 Rev. 1

Batch 1 – 15/ CSN10474 – CSN10488

Crimtech QC
representative
Client
representative

K. Conroy

Signature

Kyle Conroy

Date

June 14/07

KEVIN FENOVITUS

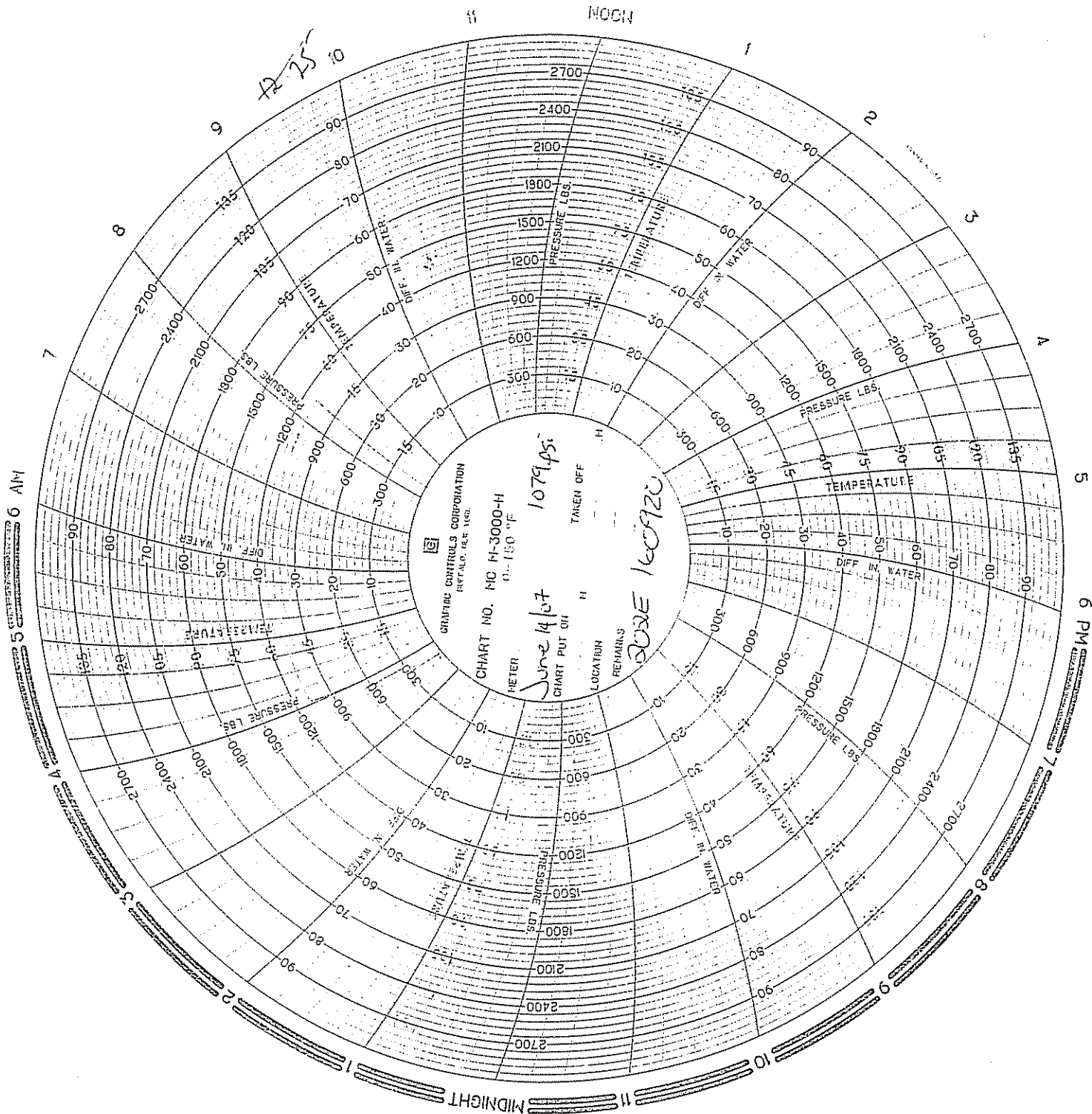
Signature

[Signature]

Date

June 14/07

10474 - 10488





R-07488

RADIOGRAPHY INSPECTION REPORT

Date: <u>MAY-22-2017</u>		<u>ASSORTED FABRICATION</u>		Page: <u>1</u> of <u>1</u>	
CLIENT: <u>CRIMTECH</u>				ECHO JOB #: <u> </u>	
CONTRACTOR: <u>AS ABOVE</u>					
LOCATION: <u>RED DEER YARD</u>				PROJECT: <u> </u>	
CLIENT JOB # (P.O., Job #, AFE, etc.): <u>NO# 310359</u>					
MATERIAL: <u>PI</u>		CODE(S): <u>CSA Z662-13 Direct</u>			
SOURCE <u>Ir 192</u>	Size <u>3.2 mm</u>	SCREENS: <u>0010" Pb F & B</u>	FILM: <u>FU3.8C</u>	SFD: <u>2.375</u>	OFD: <u>1.154</u>
VERIFIED DENSITOMETER / DENSITY STRIP ACCURACY: <input type="checkbox"/>		CAL. DATE: <u>3.5-4.5</u> <u>1.216</u> <u>1.232</u> <u>3.284</u> <u>4.263</u>			

ABBREVIATIONS

IP - Incomplete Penetration	BT - Burn Through	EP - Excess Penetration	LC - Low Cover	1 - Slight	WS - Welder Symbol
LF - Lack of Fusion	S - Slag	IC - Internal Concavity	HL - High / Low	2 - Moderate	ACC - Accept
CK - Crack	P - Porosity	IUC - Internal Undercut	EUC - External Undercut	3 - Severe	REJ - Reject
V - Visual Inspection		T - Technique (See Back)	O - Other		

INTERPRETATIONS

	FILM #	SIZE	SCH	WS	T	IP	LF	CK	P	S	BT	EP	IC	LC	HL	IUC	EUC	O	SP001 SM	COMMENTS	ACC	REJ
1	X-1	3"	STD	W	1														18024		/	
2	2	2"	STD	R	1														18028		/	
3	3	2"	STD	I	1														18117		/	
4	4	2"	STD	I										108cm					18117		/	
5	5	3"	STD	R							102 1/2	28							17996		/	
6	6	3"	STD	R							2024								17996		/	
7	7	2"	STD	W															18116		/	
8	8	2"	STD	A															18028		/	
9	9	2"	STD	A															18117		/	
10	X-10	3"	STD	R															17996		/	
11	1	2"	STD	R															18105		/	
12	2	2"	STD	R															18105		/	
13	3	3"	STD	I							1016								18024		/	
14	4	2"	STD	A															18105		/	
15	5	2"	STD	A							109-10								18105		/	
16	6	4"	STD	W															17999		/	
17	X-17	3"	STD	W															17999		/	
18	8	3"	STD	I															17998		/	
19	X-19	2"	STD	A															18036		/	
20	X-20	3"	STD	W										102 1/2	26				17998		/	

WELD or FILM QUANTITY		STAMP		Regular Hours	
11 X 2" WELD'S		JULIAN LOMOND CGSB # 9584 CGSB RT II SNT - TC - 1A RT II/MT II		4	
8 X 3" WELD'S				Overtime Hours	
1 X 4" WELD'S				Sub / Man Day	
Client Representative: <u>[Signature]</u>		Technician: <u>[Signature]</u>		Assistant: <u>J. Dicks</u>	
				EST COST = \$561.00	



R - 08744

RADIOGRAPHY INSPECTION REPORT

Date: MAY 24/07	2662 SPOOLING.	Page: 1 of 2
CLIENT: CRIMTECH SERVICES	ECHO JOB #:	
CONTRACTOR: AS ABOVE		
LOCATION: RED DEER SHOP.	PROJECT:	
CLIENT JOB # (P.O., Job #, AFE, etc.): WO# 310359		
MATERIAL: C.S.	CODE(S): CSA 2662-03 SWEET	
SOURCE: Ir 192	Size: 3.2 mm	SCREENS: 0.010" Pb F & B
FILM: FUJI 80	SFD: CONTACT	OFD: ---
SOD: ---	VERIFIED DENSITOMETER / DENSITY STRIP ACCURACY: <input checked="" type="checkbox"/> CAL. DATE:	

ABBREVIATIONS

IP - Incomplete Penetration	BT - Burn Through	EP - Excess Penetration	LC - Low Cover	1 - Slight	WS - Welder Symbol
LF - Lack of Fusion	S - Slag	IC - Internal Concavity	HL - High / Low	2 - Moderate	ACC - Accept
CK - Crack	P - Porosity	IUC - Internal Undercut	EUC - External Undercut	3 - Severe	REJ - Reject
V - Visual Inspection		T - Technique (See Back)	O - Other		

INTERPRETATIONS

	FILM #	SIZE	SCH	WS	T	IP	LF	CK	P	S	BT	EP	IC	LC	HL	IUC	EUC	O	SPool S/A#	COMMENTS	ACC	REJ
1	X-21	2"	STD	R	R														18099		✓	
2	22			R															18099		✓	
3	23	↓		I															18098		✓	
4	24	2 1/2"		I															18098		✓	
5	25	2"		I															18139		✓	
6	26			A															18098		✓	
7	27			A															18098		✓	
8	28			A															18099	FILM MARK @ 6cm.	✓	
9	29	4"		W															18021	FILM MARK @ 26cm	✓	
10	30	3"		W															18021		✓	
11	31	2"		R															18088		✓	
12	32			R															18138		✓	
13	33			I															18093		✓	
14	34			I															18093		✓	
15	35			I															18093		✓	
16	36			A															18099	FILM MARK @ 6cm	✓	
17	37			A															18100	FILM MARK @ 8cm	✓	
18	38			A															18100		✓	
19	39			W															18093		✓	
20	40			W															18095	FILM MARK @ 7cm	✓	

WELD or FILM QUANTITY

STAMP

30 - 2" to 3" WELDS
2 - 4" WELDS

GORD BOS #11303
CGSB RTII / MTII
SNT-TC-1A RTII / MTII

Regular Hours

6

Overtime Hours

—

Sub / Man Day

—

Kilometers

—

Client Representative:

Technician:

Assistant:

DANNY J.

Echo NDE Inc., Red Deer, Alberta

Phone: (403) 347-7042 • Fax: (403) 347-7052 • echonde@telus.net



R - 08745

RADIOGRAPHY INSPECTION REPORT

Date: MAY 24/07	Z662 SPOOLING.	Page: 2 of 2
CLIENT: CRIMTECH SERVICES	ECHO JOB #:	
CONTRACTOR: AS ABOVE		
LOCATION: RED DEER SHOP.	PROJECT:	
CLIENT JOB # (PO, Job #, AFE, etc.): WO#310359		
MATERIAL: C.S.	CODE(S): CSA Z662-03 SWEET	
SOURCE Ir 192 Size 3.2 mm	SCREENS: 0.010" Pb F & B	FILM: FUJI 80
SFD: CONTACT		OFD: —
SOD: —		
VERIFIED DENSITOMETER / DENSITY STRIP ACCURACY: <input checked="" type="checkbox"/>		CAL. DATE:

ABBREVIATIONS

IP - Incomplete Penetration	BT - Burn Through	EP - Excess Penetration	LC - Low Cover	1 - Slight	WS - Welder Symbol
LF - Lack of Fusion	S - Slag	IC - Internal Concavity	HL - High / Low	2 - Moderate	ACC - Accept
CK - Crack	P - Porosity	IUC - Internal Undercut	EUC - External Undercut	3 - Severe	REJ - Reject
V - Visual Inspection		T - Technique (See Back)	O - Other		

INTERPRETATIONS

	FILM #	SIZE	SCH	WS	T	IP	LF	CK	P	S	BT	EP	IC	LC	HL	IUC	EUC	O	SPOOL S/N#	COMMENTS	ACC	REJ
1	X-41	2"	STD	W	RT														18095		✓	
2	42	4"		R															18017		✓	
3	43	3"		R															18017		✓	
4	44	2"		I															18134		✓	
5	45	2"		I															18134		✓	
6	46	3"		A															18016		✓	
7	47	3"		A															18016 MIG WIRE @ 14cm.		✓	
8	48	2"		A															18084		✓	
9	49	2"		W															18084		✓	
10	50	3"		O															18016		✓	
11	51	3"		O															18017		✓	
12	52	3"		O															18017		✓	
13																						
14																						
15																						
16																						
17																						
18																						
19																						
20																						

WELD or FILM QUANTITY

STAMP

GORD BOS #11303
CGSB RTII / MTII
SNT-IC-1A RTII / MTII

Regular Hours

Overtime Hours

Sub / Man Day

Kilometers

Client Representative:

Technician:

Assistant:



R- 07849

RADIOGRAPHY INSPECTION REPORT

Date: MAY 25, 2007		Page: 1 of 1	
CLIENT: CRIMTECH		ECHO JOB #: —	
CONTRACTOR: SAME AS ABOVE			
LOCATION: RED DEER SHOP		PROJECT: ASSORTED PIPING	
CLIENT JOB # (P.O., Job #, AFE, etc.): WO# 310359		SFD: 4" CONTACT	
MATERIAL: C.S.	CODE(S): CSA Z662-03 SWEET	SFD: 2.375"	OFD: 1.54"
SOURCE Ir 192	Size 3 2 mm	SCREENS: 0 010" Pb F & B	FILM: FUSI 80
SFD: 3.5"		OFD: 2.10"	SOD: 2.221"
VERIFIED DENSITOMETER / DENSITY STRIP ACCURACY: <input type="checkbox"/>		CAL DATE:	

ABBREVIATIONS

IP - Incomplete Penetration	BT - Burn Through	EP - Excess Penetration	LC - Low Cover	1 - Slight	WS - Welder Symbol
LF - Lack of Fusion	S - Slag	IC - Internal Concavity	HL - High / Low	2 - Moderate	ACC - Accept
CK - Crack	P - Porosity	IUC - Internal Undercut	EUC - External Undercut	3 - Severe	REJ - Reject
V - Visual Inspection		T - Technique (See Back)	O - Other		

INTERPRETATIONS

	FILM #	SIZE	SCH	WS	T	IP	LF	CK	P	S	BT	EP	IC	LC	HL	IUC	EUC	O	SPOOL S/N	COMMENTS	ACC	REJ
1	X53	2"	STD	I	E														18081		✓	
2	X54	↓		A															18081		✓	
3	X55	↓		O															18069		✓	
4	X56	↓		R															18069			⊗
5	X59	3"																	18011		✓	
6	X60	↓																	18011			⊗
7	X61	↓		I															18011			⊗
8	X62	↓																	18011			⊗
9	X63	4"																	18011		✓	
10	X69	2"		O															18030		✓	
11	X70	↓																	18030	STOP-START @ 15cm	✓	
12																						
13																						
14																						
15																						
16																						
17																						
18																						
19																						
20																						

WELD or FILM QUANTITY		STAMP		Regular Hours		4 HRS
6" 2" WELD		DAVID HERNANDEZ # 11988 CGSB RT II / MT II SNT-TC-IART II / MT II		Overtime Hours		—
4" 3" WELD				Sub / Man Day		—
1" 4" WELD				Kilometers		—
Client Representative: <i>[Signature]</i>		Technician: <i>[Signature]</i>		Assistant: <i>[Signature]</i>		EST COST: \$516 ⁰⁰ + GST



R - 08902

RADIOGRAPHY INSPECTION REPORT

Date: MAY 29/07	ASS'T FABRICATION		Page: 1 of 2
CLIENT: CRIMTECH SERVICES LTD.			ECHO JOB #: 0366
CONTRACTOR: SAME AS ABOVE			
LOCATION: RED DEER SHOP	PROJECT:		
CLIENT JOB # (P.O., Job #, AFE, etc.): WO # 310359			
MATERIAL: C.S.	CODE(S): CSA Z-662-03 SWEET		
SOURCE: Ir 192	Size 3/2 mm	SCREENS: 0.010" Pb F & B	FILM: FUJI 80 SFD: CONTACT OFD: — SOD: —
VERIFIED DENSITOMETER / DENSITY STRIP ACCURACY: <input checked="" type="checkbox"/>		CAL. DATE:	

ABBREVIATIONS

IP - Incomplete Penetration	BT - Burn Through	EP - Excess Penetration	LC - Low Cover	1 - Slight	WS - Welder Symbol
LF - Lack of Fusion	S - Slag	IC - Internal Concavity	HL - High / Low	2 - Moderate	ACC - Accept
CK - Crack	P - Porosity	IUC - Internal Undercut	EUC - External Undercut	3 - Severe	REJ - Reject
V - Visual Inspection		T - Technique (See Back)	O - Other		

INTERPRETATIONS

	FILM #	SIZE	SCH	WS	T	IP	LF	CK	P	S	BT	EP	IC	LC	HL	IUC	EUC	O	COMMENTS	ACC	REJ
1	X-57	3"	STD	R	RT					(1) 4cm									SPOOL S/N 18012	✓	
2	58	3"		R															18012	✓	
3	64	2"		I															18038	✓	
4	65	3"		A						(1) 2/6cm									18012	✓	
5	66	2"		A															18077	✓	
6	67			O															18132	✓	
7	68			O						(1) 15cm									18132	✓	
8	71			R						(1) 11cm									18129	✓	
9	72			R															18129	✓	
10	73	✓		I															18038	✓	
11	74	2 1/2"		I						(1) 4cm									18038	✓	
12	75	2"		W						(1) 12cm				(1) 5cm					18077	✓	
13	76			O						FILM MARK @ 5cm									18038	✓	
14	77			O						(1) 18cm									18038	✓	
15	78			O															18129	✓	
16	79			R						(1) 2cm									18129	✓	
17	80			I						(1) 20cm									18053	✓	
18	81			I						(1) 8cm									18066	✓	
19	82			W															18053	✓	
20	83	✓	✓	W	✓														18053	✓	

WELD or FILM QUANTITY	STAMP	Regular Hours	5 1/2 REG
30 - 2" TO 3" WELDS	KYLE BRUNS #10294	Overtime Hours	—
	CGSB RTII / MTII	Sub / Man Day	—
	SNT-TC-1A RTII / MTII	Kilometers	—
Client Representative: <i>Kyle Brunson</i>	Technician: <i>[Signature]</i>	Assistant: <i>ADRIAN H.</i>	



R-08903

RADIOGRAPHY INSPECTION REPORT

Date: MAY 29/07	ASS'T FABRICATION	Page: 2 of 2
CLIENT: CRIMTECH SERVICES LTD.	ECHO JOB #: 0366	
CONTRACTOR: SAME AS ABOVE		
LOCATION: RED DEER SHOP	PROJECT:	
CLIENT JOB # (PO., Job #, AFE, etc.): WO # 310359		
MATERIAL: C.S.	CODE(S): CSA 2-662-03 SWEET	
SOURCE 1r 192	Size 3 2 mm	SCREENS: 0.010" Pb F & B
FILM: FUTI 80	SFD: CONTACT	OFD: -
SOD: -		
VERIFIED DENSITOMETER / DENSITY STRIP ACCURACY: <input checked="" type="checkbox"/>		CAL. DATE:

ABBREVIATIONS

IP - Incomplete Penetration	BT - Burn Through	EP - Excess Penetration	LC - Low Cover	1 - Slight	WS - Welder Symbol
LF - Lack of Fusion	S - Slag	IC - Internal Concavity	HL - High / Low	2 - Moderate	ACC - Accept
CK - Crack	P - Porosity	IUC - Internal Undercut	EUC - External Undercut	3 - Severe	REJ - Reject
V - Visual Inspection		T - Technique (See Back)	O - Other		

INTERPRETATIONS

	FILM #	SIZE	SCH	WS	T	IP	LF	CK	P	S	BT	EP	IC	LC	HL	IUC	EUC	O	COMMENTS	ACC	REJ
1	X-84	2"	STD	W	RT														SPOOL S/N 18054	✓	
2	85			O						(1) 5cm									18065	✓	
3	86			O															18129	✓	
4	87			R						WATER STREAK @ 9-14cm									18065	✓	
5																					
6	REPAIRS																				
7	X-56R1	2"	STD	R	RT														SPOOL S/N 18069	✓	
8	X-60R1	3"		R						(1) 15cm (1) 24cm									18011	✓	
9	X-61R1	3"		1						CONCAVE @ 29cm (3)									18011		X
10	X-62R1	3"		1						I.U.C @ 3cm (3) (3) 9cm									18011		X
11																					
12	X-61R2	3"	STD	1	RT					(1) 9cm									SPOOL S/N 18011		X
13	X-62R2	3"	STD	1	RT					(1) 22cm									SPOOL S/N 18011	✓	
14																					
15																					
16																					
17																					
18																					
19																					
20																					

WELD or FILM QUANTITY

STAMP

KYLE BRUNS #10294
CGSB RTH / MTH
SNT-TC-1A RTH / MTH

Regular Hours

Overtime Hours

Sub / Man Day

Kilometers

Client Representative:

Technician:

Assistant:

Echo NDE Inc., Red Deer, Alberta

Phone: (403) 347-7042 • Fax: (403) 347-7052 • echonde@telus.net



R-09051

RADIOGRAPHY INSPECTION REPORT

Date: <u>May-31-2007</u>	<u>ASSORTED SPOOLING</u>	Page: <u>1</u> of <u>2</u>
CLIENT: <u>CRIMTECH</u>	ECHO JOB #: <u> </u>	
CONTRACTOR: <u>AS ABOVE</u>		
LOCATION: <u>RED DEER, AB</u>	PROJECT: <u> </u>	
CLIENT JOB # (PO, Job #, AFE, etc): <u>WO# 310359</u>		
MATERIAL: <u>P1</u>	CODE(S): <u>CSA Z1662-03 SWEET</u>	
SOURCE Ir 192	Size 3.2 mm	SCREENS: 0.010" Ph F & B
FILM: <u>FUSI 80</u>	SFD: <u>2.375</u>	OFD: <u>1154</u>
VERIFIED DENSITOMETER / DENSITY STRIP ACCURACY: <input type="checkbox"/>		CAL DATE: <u>4.5.2006</u>
		<u>3.284</u> <u>4.283</u>

ABBREVIATIONS

IP - Incomplete Penetration	BT - Burn Through	EP - Excess Penetration	LC - Low Cover	1 - Slight	WS - Welder Symbol
LF - Lack of Fusion	S - Slag	IC - Internal Concavity	HL - High / Low	2 - Moderate	ACC - Accept
CK - Crack	P - Porosity	IUC - Internal Undercut	EUC - External Undercut	3 - Severe	REJ - Reject
V - Visual Inspection		T - Technique (See Back)	O - Other		

INTERPRETATIONS

	FILM #	SIZE	SCH	WS	T	IP	LF	CK	P	S	BT	EP	IC	LC	HL	IUC	EUC	O	Spool Serial	COMMENTS	ACC	REJ
1	X-6123	3"	STD	R	1					2@8-12								2ES	18011 (AS PER CLIENT REQUEST)		/	
2	X-88	4"	STD	R	1					1@34-0									18009		/	
3	↓ 9	3"	STD	R	1					10000 10000									18009		/	
4	X-90	3"	STD	1	1					1@8-10				1@5cm					18004		/	
5	↓ 1	3"	STD	1	1					1@14cm									18004		/	
6	↓ 2	3"	STD	W	1														18004		/	
7	↓ 3	2"	STD	W	1					1@17 22									18009		/	
8	↓ 4	2"	STD	R	1					1@13cm									18123		/	
9	↓ 5	2"	STD	R	1														18123 WATER MARK 3rd shot		/	
10	↓ 6			R	1					2@8, 16 1/2, 20-0									18123		/	
11	↓ 7			R	1					1 2 1'@6-14 52@2-4									18123		/	
12	↓ 8			1	1					2@20cm									18122		/	
13	↓ 9			1	1														18122		/	
14	X-100	3"	STD	W	1														18002 WATER MARK 3rd shot		/	
15	↓ 1	3"	STD	O	1					2@22									18002		/	
16	↓ 2	3"	STD	O	1					1@2cm									18002		/	
17	↓ 3	2"	STD	O	1														18047		/	
18	X-104	3"	STD	R	1														18009		/	
19																						
20																						

WELD or FILM QUANTITY	STAMP	Regular Hours	<u>3</u>
<u>1 x 4" weld</u>	JULIAN LOMOND CGSB # 9584 CGSB RT II SNT-TC-1A RT II/MT II	Overtime Hours	<u>—</u>
<u>17 x 2" & 3" welds</u>		Sub / Man Day	<u>—</u>
		Kilometers	<u>—</u>
Client Representative: <u>[Signature]</u>	Technician: <u>[Signature]</u>	Assistant: <u>ANDREW H</u>	EST COST = <u>\$ 436.00 HRS</u>

Echo NDE Inc, Red Deer, Alberta

Phone: (403) 347-7042 • Fax: (403) 347-7052 • echonde@telus.net

WELDING PROCEDURE SPECIFICATION NO.: CRIM-3 (REV. 1)

WELDING PROCEDURE QUALIFICATION RECORD NO.(S): MIL-3-1, MIL-3-2

QUALIFIED FOR

Base Metal (Typical): P1 to P1 (SA 36, SA 106 Gr. B, SA 105, SA 516 Gr. 70, etc.)
Process(es): GMAW / SMAW Weld Types: GROOVE & FILLET
Position: ALL POSITIONS Diameter: ALL DIAMETERS
Filler Metal: ER70S-6, E7018, E7018-1

BASE METAL CONDITIONS & GROOVE THICKNESS RANGE QUALIFIED:

STANDARD APPLICATIONS AS WELDED
BASE METAL THICKNESS RANGE 4.8 to 38.1 mm (0.188 to 1.50 in.) inclusive

COMBINED DEPOSITED WELD METAL THICKNESS
ASME B31.1 19.1 mm (0.750 in.) maximum
ASME B31.3 19.1 mm (0.750 in.) maximum
ASME SECT. VIII, DIV.1 38.1 mm (1.50 in.) maximum

ALBERTA BOILERS SAFETY ASSOCIATION	
PROVINCE OF ALBERTA	
SAFETY CODES ACT	
WELDING PROCEDURE	
Reg. No. WP	<u>1861.2</u>
Spec No.	<u>CRIM-3 (REV. 1)</u>
Weld Process	<u>GMAW / SMAW</u>
Matl. Gr. P No.	<u>1</u> to P No. <u>1</u>
Elec. Gr. F No.	<u>6+4</u> A No. <u>*+1</u>
Th. Qual. For	<u>38.1mm</u> PWHT <u>NO</u>
<u>*ER70S-6 ELECTRODE</u>	
Yr. Mo. Day	<u>05 12 14</u> Signed <u>R. ROSEBERG, P.ENG.</u>
WELDING SPECIALIST	

PROVINCIAL REGISTRATION

--

Welder's Name/File Number	Symbol	Process /Method	Base Metals	Filler Metal "F" Number(s)	Backing	Minimum OD (in.)	Deposit Thicknesses	Positions	Uphill/ Downhill / Solid II	Insert	Backing Gas	GTAW Current	GMAW X-Fer	Expiry Date P.Q. Card MM/DD/YYYY
Kris	A	SMAW	P1-P11	F3/F4	F3-WWO F4-W	1"	F3-0.25" F4-0.616"	All	Uphill	N/A	N/A	N/A	N/A	5/12/2008
Streeter		GMAW SMAW	P1-P11	F6/F4	F6-WWO F4-W	1"	F6-0.110" F4-0.487"	F6 0-45° F4 Flat	N/A	N/A	N/A	N/A	Short Circuit	5/12/2008
W-18796		SMAW	P1-P11	F4	WITH	2 7/8"	MTBW	FLAT	N/A	N/A	N/A	N/A	N/A	10/2/2008
Ray	R	SMAW	P1-P11	F3/F4	F3-WWO F4-W	1"	F3-0.188" F4-0.6846"	All	Uphill	N/A	N/A	N/A	N/A	12/13/2007
Adair		GMAW SMAW	P1-P11	F6/F4	F6-WWO F4-W	1"	F6-0.130" F4-0.433"	F6 0-45° F4 Flat	N/A	N/A	N/A	N/A	Short Circuit	4/28/2008
W-4459		GMAW FCAW	P1-P11	F6/F6	G-WWO FCAW-W	1"	GMAW- 0.1105"	GMAW 0-45° FCAW- Flat	N/A	N/A	N/A	N/A	Short Circuit	12/13/2007
		SMAW	P1-P11	F4	WITH	2 7/8"	MTBW	FLAT	N/A	N/A	N/A	N/A	N/A	9/28/2008
Orlando	O	SMAW	P1-P11	F3/F4	F3-WWO F4-W	1"	F3-0.188" F4-0.500"	All	Uphill	N/A	N/A	N/A	N/A	1/17/2008
Morales		GMAW SMAW	P1-P11	F6/F4	F6-WWO F4-W	1"	F6-0.110" F4-0.236"	F6 0-45° F4 Flat	N/A	N/A	N/A	N/A	Short Circuit	1/17/2008
W-20172		SMAW	P1-P11	F4	WITH	2 7/8"	MTBW	FLAT	N/A	N/A	N/A	N/A	N/A	9/29/2008
Steve	W	SMAW	P1-P11	F3/F4	F3-WWO F4-W	1.00	F3-0.188" F4-0.684"	All	Uphill	N/A	N/A	N/A	N/A	7/14/2008
Becker		GMAW SMAW	P1-P11	F6/F4	F6-WWO F4-W	1.00	F6-0.110" F4-0.236"	F6 0-45° F4 Flat	N/A	N/A	N/A	N/A	Short Circuit	7/21/2008
W-24208		SMAW	P1-P11	F4	WITH	2 7/8"	MTBW	FLAT	N/A	N/A	N/A	N/A	N/A	9/29/2008
Rob	S	SAW	P1-P11	F6	WITH	2.875"	MTBW	FLAT	N/A	N/A	N/A	N/A	N/A	5/11/2008
Stasiak														
70452														
Gordon	M	SAW	P1-P11	F6	WITH	2.875"	MTBW	FLAT	N/A	N/A	N/A	N/A	N/A	5/11/2008
Simmons														
70451														
Ron	I	SMAW	P1-P11	F3/F4	F3-WWO F4-W	1.00	F3-0.188" F4-0.684"	All	Uphill	N/A	N/A	N/A	N/A	9/19/2007
Olstrom		GMAW SMAW	P1-P11	F6/F4	F6-WWO F4-W	1.00	F6-0.110" F4-0.236"	F6 0-45° F4 Flat	N/A	N/A	N/A	N/A	Short Circuit	9/19/2007
W-8184		SMAW	P1-P11	F4	WITH	2 7/8"	MTBW	FLAT	N/A	N/A	N/A	N/A	N/A	10/2/2008

Jason	H	SMAW	P1-P11	F3/F4	F3-W/WO F4-W	1.00	F3-0.188" F4-0.684"	All	Uphill	N/A	N/A	N/A	N/A	N/A	12/20/2008
Hagen		GMAW SMAW	P1-P11	F6/F4	F6-W/WO F4-W	1.00	F6-0.110" F4-0.236"	F6 0-45° F4 Flat	N/A	N/A	N/A	N/A	N/A	Short Circuit	12/20/2008
W-23296		SMAW	P1-P11	F4	WITH	2 7/8"	MTBW	FLAT	N/A	N/A	N/A	N/A	N/A	N/A	12/20/2008

Duane	D	SMAW	P1-P11	F3/F4	F3-W/WO F4-W	1.00	F3-0.188" F4-0.684"	All	Uphill	N/A	N/A	N/A	N/A	N/A	5/29/2009
Harris		GMAW SMAW	P1-P11	F6/F4	F6-W/WO F4-W	1.00	F6-0.110" F4-0.236"	F6 0-45° F4 Flat	N/A	N/A	N/A	N/A	N/A	Short Circuit	6/11/2009
W18769		SMAW	P1-P11	F4	WITH	2 7/8"	MTBW	FLAT	N/A	N/A	N/A	N/A	N/A	N/A	6/11/2009

Brent	T	SMAW	P1-P11	F3/F4	F3-W/WO F4-W	1.00	F3-0.25" F4-0.616"	All	Uphill	N/A	N/A	N/A	N/A	N/A	10/5/2008
Turney		GMAW SMAW	P1-P11	F6/F4	F6-W/WO F4-W	1.00	F6-0.129" F4-0.433"	F6 0-45° F4 Flat	N/A	N/A	N/A	N/A	N/A	Short Circuit	10/5/2008
W-21825		SMAW	P1-P11	F4	WITH	2 7/8"	MTBW	FLAT	N/A	N/A	N/A	N/A	N/A	N/A	10/5/2008

Derrek	E	SMAW	P1-P11	F3/F4	F3-W/WO F4-W	1.00	F3-0.25" F4-0.616"	All	Uphill	N/A	N/A	N/A	N/A	N/A	4/24/2009
Kozachuck		GMAW SMAW	P1-P11	F6/F4	F6-W/WO F4-W	1.00	F6-0.110" F4-0.236"	F6 0-45° F4 Flat	N/A	N/A	N/A	N/A	N/A	Short Circuit	6/25/2009
W-24103		SMAW	P1-P11	F4	WITH	2 7/8"	MTBW	FLAT	N/A	N/A	N/A	N/A	N/A	N/A	9/28/2008

Jeff	J	GMAW SMAW	P1-P11	F6/F4	F6-W/WO F4-W	1.00	F6-0.110" F4-0.236"	F6 0-45° F4 Flat	N/A	N/A	N/A	N/A	N/A	Short Circuit	6/29/2009
Oracheski															
W-17339															

Noel	N	GMAW SMAW	P1-P11	F6/F4	F6-W/WO F4-W	1.00	F6-0.110" F4-0.236"	F6 0-45° F4 Flat	N/A	N/A	N/A	N/A	N/A	Short Circuit	6/29/2009
Kowall															
W-22236															

Russ	G	SAW	P1-P11	F-6	With	2 7/8"	MTBW	Flat	N/A	N/A	N/A	N/A	N/A	N/A	7/26/2009
Cole															
70229															

3" STD A100 Head# 0614195

Contract No.: 06HGC09544

L/C NO. 6FAHDS-00632

Name of Customer: CR FRANKLIN

P.O. NO.: PO159095-OS-4908-A

DESCRIPTION: SEAMLESS CARBON STEEL PIPE FOR OIL AND GAS USE

TOTAL: 1749PIECES, 51BUNDLES, 115.391MT, 35180FT

HONGYANG VALVE STEEL TUBE CO., LTD

MILL TEST REPORT

Date: NOV. 14, 2006

Page: 1/1

Address: 10 Dalidajou, Hongyong City, Hunan, China

Tel and Fax: +86 734 8873739 8872942

Cable: 6993

P.C. 421001

SPEC: ASTM A53B-2002/A106B-2002a, ASME SA53B/SA106B-2004, API 5L B/X42, PS1-2004, NACE MR-0175-1998															CERTIFICATE NO. 0504056			
NO.	BATCH NO.	HEAT NO.	STEEL GRADE	SIZE	BUNDLES	PIECES	FEET	QUANTITY (MT)	ACTUAL WEIGHT (MT)									
1	56Y100532	06109340-3	B/X42	2"X40.161"X20FT	5	276	5600	9.131	N/A									
2	56Y200435	08208785-3	B/X42	2"X40.218"X20FT	16	687	13740	31.349	N/A									
3	96Y400606	0614195	B/X42	3"X40.216"X20FT	10	240	4800	16.53	N/A									
4	98Y101106	0614250	B/X42	3"X40.301"X20FT	9	218	4360	20.291	N/A									
5	98Y101005	0614284	B/X42	4"X40.237"X20FT	9	211	4230	20.673	N/A									
6	98Y301203	0614287	B/X42	4"X40.317"X20FT	8	128	2560	17.418	N/A									
CHEMICAL COMPOSITION %																		
NO.	DELIVERY CONDITION	NONDESTRUCTIVE TEST												HYDROSTATIC TEST				BEND TEST
		EDDY CURRENT TEST	ULTRASONIC TEST	C	SI	Mn	P	S	Cu	NI	Cr	Mo	V	Al	CE	Me/C		
1	COLD-DRAWN (B/C)	OK	N/A	0.22	0.29	0.66	0.018	0.013	0.13	0.01	0.02	0.01	0.000	0.000	0.35	3.0		
2	COLD-DRAWN (B/C)	OK	N/A	0.21	0.23	0.63	0.021	0.016	0.13	0.02	0.04	0.01	0.000	0.000	0.34	3.0		
3	HOT-ROLLED	OK	N/A	0.17	0.44	0.84	0.014	0.005	0.08	0.09	0.02	0.01	0.001	0.000	0.32	4.8		
4	HOT-ROLLED	OK	N/A	0.18	0.43	0.96	0.018	0.008	0.08	0.09	0.04	0.01	0.007	0.000	0.36	5.3		
5	HOT-ROLLED	OK	N/A	0.20	0.49	0.88	0.012	0.005	0.08	0.09	0.02	0.02	0.003	0.000	0.36	4.4		
6	HOT-ROLLED	OK	N/A	0.18	0.45	0.94	0.011	0.006	0.06	0.03	0.03	0.03	0.003	0.000	0.36	5.2		
NO.	TENSILE STRENGTH	YIELD STRENGTH	ELONGATION	AL (J)		HARDNESS				FLATTEN TEST				BEND TEST				
				8 (%)	IMPACT	TEST				TEST								
1	68600	44560	23.0	N/A	N/A	HRC 3.5	2800 PSI				N/A				OK			
2	68600	44560	32.0	N/A	N/A	HRC 4	2800 PSI				N/A				OK			
3	79025	61475	35.0	N/A	N/A	HRC 6	3000 PSI				OK				N/A			
4	79126	50750	37.0	N/A	N/A	HRC 7.0	3000 PSI				OK				N/A			
5	78300	52200	33.0	N/A	N/A	HRC 8	3000 PSI				OK				N/A			
6	76860	50025	31.0	N/A	N/A	HRC 7.0	3000 PSI				OK				N/A			

REMARKS: 1. We hereby certify that the material has been manufactured, sampled, tested and inspected in accordance with the required standards.

2. Properties compliance to DIN 50049 3.1. BAUN EN 10204 3.1B.

3. BRINELL / Rockwell hardness certified to NACE MR-0175-99.

4. SPECIMEN SIZE: (Pipe end, Longitudinal, Gauge Length=2")

A. For pipes < 1" fluid length specimen were used.

B. For pipes > 1" longitudinal strip specimen were used; the width of the gauge length portion is 3/4".

5. MATERIALS COMP IRM TO ANSI B36.10, A530/A530M

QUALITY MANAGER:

[Signature]

CRIMTECH SERVICES LTD.

MATERIAL CONFORMS TO: ASME

SEC. II, 2001 EDITION, 2004 ADDENDA

MAY 17 2007

By:

[Signature]

P.O. No.

Benteler Stahl/Rohr GmbH
Postfach 13 40
33043 Paderborn
Deutschland
Tel.: +49.5254.81-0 Fax: +49.5254.13665

BENTELER
Stahl/Rohr

ABNAHMEPRÜFZEUGNIS EN 10204-3.1
INSPECTION CERTIFICATE EN 10204-3.1
CERTIFICAT DE RECEPTION EN 10204-3.1
EN 10204:2005-01

Benteler Stahl/Rohr GmbH - Postfach 1340 - 33043 Paderborn - Deutschland

BHD Tubular Ltd.
6903 - 72nd Ave.,
EDMONTON, AB T6B 3A5
KANADA

Dokument-Nr.:
Document No.:
No. du document:

65-332351/001/P

Kunden-Bestell-Nr.:
Purchase Order No.:
No. de commande du client:

06-5611 / 104842

Benteler Auftrags-Nr.:
Benteler Order No.:
No. de commande Benteler:

1142713

Versandanzeiger-Nr.:
Dispatch Note No.:
No. d'avis d'expédition:

6513521

Produkt: NAHTLOSE STAHLROHRE
Product: SEAMLESS STEEL TUBES
Produit: TUBES D'ACIER SANS SOUDURE

Lieferbedingungen:

CSA Standard Z245.1-02 Category I, API Specification 5L Forty-Third Edition, March 2004, PSL 1, ASTM-A 106-2004b, S5, ASME SA-106, ASME Section II, Part A Edition 2004 Addenda 2005, S5, NACE MR0175/ISO 15156-1:2001, NACE MR0175/ISO 15156-2:2003.

Maße - Toleranzen:

ASME B36.10M-2004, ASME SA-530, ASME Section II Part A Edition 2004 Addenda 2005, ASTM-A 530-2004a

Dimensions-tolérances:

Stahlsorte:
Steel grade:
Nuance d'acier:

GRADE 290, GRADE B, GRADE X 42

Lieferzustand:

Hot rolled

Delivery condition:

État de livraison:

Produktkennzeichnung:

see attachment product marking

Product marking:

Marquage du produit:

CRIMECH SERVICES LTD. MATERIAL CONFORMS TO: ASME SEC. II, 2004 EDITION, 2004 ADDENDA
By: MAY 15 2007 KHT
P.O. No.

Pos.	Stück Item Poste	Maße Dimensions Dimensions	Länge Length Longueur	Gewicht Weight Poids	Schmelzen-Nr. Heat No. No. de coulée	Prüfdruck Test pressure Pression d'épreuve	Rohr-Nr.-Gruppe Tube number group Série de no. des tubes	Vielfachlänge Multiple lengths Longueurs multi
0001	545	2" NPS * Sched. 40 18 FT - 22 FT	11618,18 feet	41667 lbs	743600	207 bar	5	
0002	304	2" NPS * Sched. 40 38 FT - 42 FT	12626,67 feet	45450 lbs	743597	207 bar	5	

1978 2nd S40 STD P.p.e
Heat # 743600 9100

Benteler Stahl/Rohr GmbH
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Deutschland
Tel.: +49.5254.81-0 Fax: +49.5254.13665

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Pos.	Stück	Maße	Länge	Gewicht	Schmelzen-Nr.	Prüfdruck	Rohr-Nr.-Gruppe	Viellachlänge
Item	Number	Dimensions	Length	Weight	Heat No.	Test pressure	Tube number group	Multiplies lengths
Poste	Nombre	Dimensions	Longueur	Poids	No. de coulée	Pression d'épreuve	Série de no. des tubes	Longueurs multi
			feet	lbs		bar		s
0003	1336	2" NPS ± Sched. 80 18 FT - 22 FT	26260,66	131140	743450	207	5	
0004	372	3" NPS ± Sched. 40 18 FT - 22 FT	7925,07	60799	743656	207	5	
0006	282	4" NPS ± Sched. 80 18 FT - 22 FT	6139,37	91496	534401	207	5	

Schmelzenanalyse [%] / Heat analysis [%] / Analyse sur coulée [%]

Pos.	Schmelzen-Nr.	C	Si	Mn	P	S	Cr	Mo	Ni	Cu	V	Nb	Ti	B
Item	Heat No.													
Poste	No. de coulée													
0001	743600	0,135	0,195	0,82	0,009	0,003	0,16	0,03	0,13	0,17	0,001	0,010	0,003	0,0002
0002	743597	0,135	0,203	0,81	0,009	0,003	0,16	0,04	0,13	0,17	0,001	0,010	0,003	0,0002
0003	743450	0,130	0,197	0,81	0,010	0,004	0,15	0,04	0,15	0,18	0,002	0,010	0,003	0,0002
0004	743656	0,130	0,200	0,82	0,007	0,004	0,09	0,02	0,09	0,13	0,001	0,010	0,003	0,0001
0006	534401	0,140	0,220	0,79	0,008	0,003	0,16	0,04	0,12	0,18	0,001	0,010	0,003	0,0002

1. Formel: $CEI = C + (Mn/6) + ((Cr + Mo + V)/5) + ((Cu + Ni)/15) \leq 0,40 \%$
2. Formel: $CEV = C + F + ((Mn/6) + (Si/24) + (Cu/15) + (Ni/20) + ((Cr + Mo + V + Nb)/5) + (5 \cdot B)) \leq 0,40$
3. Formel: $Mn/C \geq 3/1$
4. Formel: $Cr + Cu + Mo + Ni + V \leq 1,00 \%$

Formelergebnisse / Formula results / Résultats des formules

Pos.	Schmelzen-Nr.	1. Formel	2. Formel	3. Formel	4. Formel
Item	Heat No.	1. Formula	2. Formula	3. Formula	4. Formula
Poste	No. de coulée	1. Formule	2. Formule	3. Formule	4. Formule
0001	743600	0,330	0,308	6,074	0,491
0002	743597	0,330	0,309	6,000	0,501
0003	743450	0,325	0,293	6,231	0,522

Benteler Stahl/Rohr GmbH
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Pos.	Schmelzen-Nr	1. Formel	2. Formel	3. Formel	4. Formel
Item	Heat No.	1. Formula	2. Formula	3. Formula	4. Formula
Poste	No. de coulée	1. Formule	2. Formule	3. Formule	4. Formule
0004	743656	0,304	0,276	6,308	0,331
0006	534401	0,332	0,312	5,643	0,501

Pos.	Schmelzen-Nr.	C	Si	Mn	P	S	CR	MO	Ni	CU	V	Nb	Ti	B
Item	Heat No.													
Poste	No. de coulée													
0001	743600	0,130	0,190	0,81	0,009	0,002	0,16	0,03	0,16	0,17	0,002	0,010	0,002	0,0004
0001	743600	0,130	0,190	0,82	0,009	0,002	0,16	0,03	0,15	0,17	0,002	0,010	0,002	0,0003
0002	743597	0,130	0,190	0,81	0,009	0,002	0,16	0,03	0,16	0,17	0,002	0,010	0,002	0,0003
0002	743597	0,130	0,190	0,81	0,009	0,002	0,16	0,03	0,15	0,17	0,002	0,010	0,002	0,0002
0003	743450	0,140	0,220	0,77	0,012	0,007	0,15	0,04	0,13	0,19	0,003	0,006	0,003	0,0004
0003	743450	0,140	0,220	0,77	0,012	0,006	0,15	0,04	0,13	0,19	0,003	0,006	0,003	0,0004
0004	743656	0,130	0,180	0,82	0,007	0,002	0,10	0,02	0,08	0,13	0,001	0,010	0,002	0,0002
0004	743656	0,130	0,180	0,82	0,007	0,002	0,10	0,02	0,08	0,13	0,001	0,010	0,002	0,0002
0006	534401	0,150	0,200	0,82	0,009	0,003	0,17	0,04	0,13	0,18	0,002	0,010	0,003	0,0005
0006	534401	0,140	0,200	0,83	0,009	0,002	0,17	0,04	0,13	0,18	0,002	0,010	0,002	0,0004

1. Formel: $CE\ IIW = C + (Mn/6) + ((Cr+Mo+V)/5) + ((Cu+Ni)/15) \leq 0,40\%$
 2. Formel: $CEV = C + F + ((Mn/6) + (Si/24) + (Cu/15) + (Ni/20) + ((Cr+Mo+V+Nb)/5) + (5 \cdot B)) \leq 0,40$
 3. Formel: $Mn/C \geq 3/1$
 4. Formel: $Cr+Cu+Mo+Ni+V \leq 1,00\%$

Pos.	Schmelzen-Nr	1. Formel	2. Formel	3. Formel	4. Formel
Item	Heat No.	1. Formula	2. Formula	3. Formula	4. Formula
Poste	No. de coulée	1. Formule	2. Formule	3. Formule	4. Formule
0001	743600	0,325	0,294	6,231	0,522
0001	743600	0,326	0,294	6,308	0,512

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Formelergebnisse / Formula results / Résultats des formules

Pos.	Schmelzen-Nr. Item Heat No. Poste No. de coulée	1. Formel 1. Formula 1. Formule	2. Formel 2. Formula 2. Formule	3. Formel 3. Formula 3. Formule	4. Formel 4. Formula 4. Formule
0002	743597	0,325	0,293	6,231	0,522
0002	743597	0,325	0,293	6,231	0,512
0003	743450	0,328	0,309	5,500	0,513
0003	743450	0,328	0,309	5,500	0,513
0004	743656	0,305	0,277	6,308	0,331
0004	743656	0,305	0,277	6,308	0,331
0006	534401	0,350	0,335	5,467	0,522
0006	534401	0,341	0,320	5,929	0,522

Prüfergebnisse / Test results / Résultats des essais

Die Rohre sind auf Dichtheit geprüft durch:
The tubes have been submitted to a leak tightness test by:
Les tubes ont passé un contrôle d'étanchéité par:
Hydrostatic test: acc. to CSA Z245.1, holding time min 5 seconds, Test
pressure/Time-record
PASSED

Augensichtkontrolle:
Visual inspection:
Examen visuel:
PASSED
Biegeversuch:
Bending test:
Essai de cintrage:
Pos. / Item / Poste: 0001, 0002, 0003
Maßkontrolle:
Dimensions examination:
Vérification des dimensions:
PASSED

Ringfaltversuch:
Flattening test:
Essai d'aplatissement:
Pos. / Item / Poste: 0004, 0006
PASSED

Ergebnisse der mechanischen Prüfung / Results of mechanical testing / Résultats des essais mécaniques

Die Probenahme erfolgte an Vielfachlängen.
The sampling was carried out on multiple lengths.
L'échantillonnage était réalisé aux longueurs multiples.

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Zugversuch Streifenprobe / Tensile test Strip test specimen / Essai de traction Bande decoupee sur tube

Pos. Item Poste	Proben-Nr. Specimen No. No. de l'éprouvette	Schmelzen-Nr. Heat No. No. de coulée	Probenabmessung Specimen dimensions Dimensions de l'éprouv.	Streckgrenze Yield strength Limite élastique	ReH MPa 290-495	Zugfestigkeit Tensile strength Résistance à la traction	Dehnung Elongation Allongement	Einschnürung Area reduction Coefficient de striction	Re/Rm Re/Rm Re/Rm
Anforderungen Requirements Exigences									
0001	000001	743600	19,00 X 3,80	384	✓	487	37,00	✓	1. Formel 1. Formula 1. Formule
0001	000002	743600	19,00 X 3,80	390		486	37,00		
0002	000001	743597	19,00 X 3,80	379		493	36,00		
0002	000002	743597	19,00 X 3,80	372		497	37,00		
0003	000001	743450	19,00 X 5,50	369		471	42,00		
0003	000002	743450	19,00 X 5,50	375		479	43,00		
0004	000001	743656	25,40 X 5,50	348		471	41,00		
0004	000002	743656	25,40 X 5,50	357		466	41,00		
0006	000001	534401	25,40 X 8,50	340		476	40,00		
0006	000002	534401	25,40 X 8,50	345		491	38,00		

Härteprüfung / Hardness test / Essai de dureté

Pos. Item Poste	Proben-Nr. Specimen No. No. de l'éprouv.	Schmelzen-Nr. Heat No. No. de coulée	Härte Hardness Dureté	HRC	HB	HV	HRB
Anforderungen Requirements Exigences							
0001	000001	743600			MAX 200		
0002	000001	743597			136		
0003	000001	743450			137		
0004	000001	743656			141		
0006	000001	534401			133		
0006	000001	534401			139		

Benteler Stahl/Rohr GmbH
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Deutschland
Tel.: +49 5254 81-0 Fax: +49 5254 13666

BENTELER
Stahl/Rohr

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Dokument-Nr.: 65-332351/001/P

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Restmagnetismus / Demagnetize / Démagnétiser

Pos. / Item / Poste: 0001, 0002, 0004, 0006, 0003
residual magnetic field intensity max 3,5 millitesla

Pos. Item Poste	Ihr Zeichen Your reference Votre référence	Kundenmaterial Customer's Material No. No. de matière du client	Kundenbestell-Nr. Purchase Order No. No. de commande du client
0001		P.O. 104842	06-5611 / 104842
0002		P.O. 104842	06-5611 / 104842
0003		P.O. 104842	06-5611 / 104842
0004		P.O. 104842	06-5611 / 104842
0006		P.O. 104842	06-5611 / 104842

Vermerk / Remark / Remarque

Pos. / Item / Poste: 0001, 0003, 0002, 0002, 0002, 0003, 0002, 0003, 0002
NACE Standard: Hardness acc. to NACE MR0175/ISO 15156: HRC max 22., The material meets the requirements of NACE MR0103; Certificate remarks: This is to confirm that the seamless linepipe supplied by Benteler and verified to CSA Standard Z245.1-02 meets the requirement for micro hardness of max. 248 HV 500.; Bend test: mandrel diameter 12D, bending angle 90 degree

Pos. / Item / Poste: 0004, 0006, 0006, 0006
NACE Standard: Hardness acc. to NACE MR0175/ISO 15156: HRC max 22., The material meets the requirements of NACE MR0103; Certificate remarks: This is to confirm that the seamless linepipe supplied by Benteler and verified to CSA Standard Z245.1-02 meets the requirement for micro hardness of max. 248 HV 500.

Beiblatt Produktkennzeichnung / Attachment product marking / Supplément marquage du produit

Pos. Produktkennzeichnung

Item Produktkennzeichnung

Poste Marquage du produit

0001, 0002, 0003, 0004, 0006

FS: BENTELER Z.245.1, Spec.5L-PSL1, A/SA-106 S5 B/X42/290 HEAT-NO. TEST PRESSUR E DIMENSIONS SCHEDULE WA GERMANY
P.O. 104842

FK = Farbmarkierung, colour marking, marquage par couleur FS = Farbschablonierung, paint stencilling, marquage par polymère FSD = Farbstahldrucker, Colour let printer, Imprimante à jet d'encre de couleur LS = Längsschablonierung, longitudinal stencilling, marq longitudinal par peinture PKE = Etikettenkennzeichnung, tag marking, marquage sur étiquette PS = Prägestempel, die stamp, marquage par poinçonnage TS = Tintenstrahlkennzeichnung, ink jet spray marking, imprimante à jet d'encre

Benteler Stahl/Rohr GmbH
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Stahl/Rohr

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Verkäufer(in) / Salesman/woman in charge / Personne chargée :

Mr Seelbach, Tel.: 05254/81-4281, Fax: 4289

Dinslaken, 16.05.2006, TEL.: 02064.623-538 FAX: 02064.623-539



Abnahmebeauftragter
Inspection representative
Contrôleur

ROLF TRITTEL/SCHIEF

Es wird bestätigt, daß die gelieferten Erzeugnisse den techn. Lieferbedingungen des Auftrages entsprechen. Dieses Dokument wurde mittels EDV erstellt und ist ohne Unterschrift rechtsgültig.
We certify that the supplied products comply with the order specification. This document was prepared by means of electronic data processing and is valid without signature.
Nous attestons que les produits livrés sont conformes aux stipulations de la commande. Ce document a été établi par traitement électronique et est valide sans signature.

Contract No: 05HGC01002-1

L/C NO. N.I.L.C.

Name of Customer: IMEX

ORDER NO.: P.O.NO.: 05HGC01002-1

DESCRIPTION: SEAMLESS CARBON STEEL PIPE

TOTAL: 3518PIECES, 109BUNDLES, 228,909MT, 76460 FT

HUNAN HENGYANG STEEL TUBE (GROUP) CO., LTD

MILL CERTIFICATE

Date: APR. 25, 2005

Page: 3/5

Add: 10 Dalixincun, Hengyang City, Hunan, China
Tel and Fax: +86 734 8873739 8872942
Cable: 6993
P.C. 421001

TOTAL: 3518PIECES, 109BUNDLES, 228.909MT, 76460 FT															CERTIFICATE NO: 0504049				
SPEC: ASTM A53B-2001/A106B-99, ASME SA53B-2001/SA106B-99, API 5L B1X42-2000, NACE MR-0175-1999																			
NO.	BATCH NO.	HEAT NO.	STEEL GRADE	SIZE	BUNDLES	PIECES	FEET	QUANTITY (MT)	ACTUAL WEIGHT(MT)										
18	954101204	0522016V	X42	2"STD BE SRL	12	732	14640	24.240											
19	954401215	0522309	X42	2"STD BE SRL	10	624	12480	20.661											
19	954401212	0522308	X42	2"STD BE DRL	5	169	6760	11.192											
20	954101307	0522535	X42	3"STD BE SRL	12	444	8880	30.528											
20	954202004	0522647	X42	3"STD BE SRL	12	444	8880	30.528											
21	954202008	0522645	X42	3"STD BE SRL	13	481	9620	33.085											
21	954101306	0511371	X42	3"STD BE DRL	6	108	2160	14.853											
22	954202015	0511467	X42	4"STD BE SRL	10	190	3800	18.600											
22	954202016	0522655	X42	4"STD BE SRL	10	190	3800	18.597											
23	954200807	0521839	X42	4"STD BE DRL	19	136	5440	26.625											
NONDESTRUCTIVE TEST										CHEMICAL COMPOSITION %									
DELIVERY			EDDY CURRENT TEST		ULTRASONIC TEST		C	Si	Mn	P	S	Cu	Ni	Cr	Mo	V			
18	HOT-ROLLED		OK				0.22 ✓	0.27	0.78	0.015	0.008 ✓	0.15	0.05	0.02	0.01	0.001 ✓			
	HOT-ROLLED		OK				0.23	0.27	0.75	0.012	0.007	0.15	0.05	0.02	0.01	0.001			
19	HOT-ROLLED		OK				0.22	0.24	0.84	0.014	0.005	0.15	0.06	0.03	0.01	0.001			
20	HOT-ROLLED		OK				0.27	0.22	0.73	0.009	0.010	0.15	0.04	0.02	0.01	0.010			
	HOT-ROLLED		OK				0.24	0.30	0.79	0.010	0.005	0.16	0.04	0.04	0.01	0.002			
	HOT-ROLLED		OK				0.25	0.31	0.78	0.011	0.012	0.14	0.05	0.04	0.01	0.003			
21	HOT-ROLLED		OK				0.23	0.20	0.78	0.011	0.006	0.16	0.04	0.03	0.01	0.001			
22	HOT-ROLLED		OK				0.24	0.27	0.77	0.011	0.006	0.12	0.04	0.03	0.01	0.001			
	HOT-ROLLED		OK				0.24	0.31	0.74	0.015	0.014	0.11	0.03	0.03	0.01	0.004			
23	HOT-ROLLED		OK				0.25	0.26	0.81	0.022	0.009	0.16	0.05	0.04	0.01	0.002			
MECHANICAL PROPERTIES										HYDROSTATIC TEST									
NO.	TENSILE (PSI)		YIELD STRENGTH		ELONGATION		IMPACT		HARDNESS		FLATTEN TEST		BEND TEST						
18	83375 ✓		54375 ✓		28.5 ✓		AK (J)		HRC 7.5		2800 PSI		OK						
19	84100		54375		29.5				HRC 6.5		2800 PSI		OK						
20	86275		54375		31				HRC 6.0		2800 PSI		OK						
	83375		52925		30				HB 152		2800 PSI		OK						
	81200		52200		32				HB 150		2800 PSI		OK						
	80475		53650		29				HB 156		2800 PSI		OK						
21	81925		54375		35				HB 157		2800 PSI		OK						
22	84100		55100		33				HB 161		2800 PSI		OK						
	84825		52200		31				HB 157		2800 PSI		OK						
23	80475								HB 162		2800 PSI		OK						

REMARKS: 1. We hereby certify that the material has been manufactured, sampled, tested and inspected in accordance with the required standards.

2. Properties compliance to DIN 50049 3.1.B/UNI EN 10204 3.1.B.

3. BRINELL /Rockwell hardness certified to NACE MR-0175-99.

4. SPECIMEN SIZE: (Pipe end, Longitudinal, Gauge Length=2")

A. For pipes ≤ 1" full length specimen were used;

B. For pipes > 1" longitudinal strip specimen were used; the width of the gauge length portion is 3/4"

5. Origin: Made in China.

QUALITY MANAGER

VERIFIED BY

WESTLUND

CRIMINAL SERVICES LTD.
AUG 29 2007
104

145

TOTAL P.01

2" STD A1060 Heat# 06102430-2 SA106B

Contract No.: 06RKC08487-1

L/C NO. 6FALHX-00631

Name of Customer:

P.O. NO.:

DESCRIPTION: SEAMLESS CARBON STEEL PIPE FOR OIL AND GAS USE

TOTAL: 116PIECES, 92BUNDLES, 187460MT, 82500FT

JAN U-1 2007

HECHANG VALIN STEEL TUBE CO., LTD

MILL TEST REPORT

Add: 10 Dailiucun, Hongyang City, Hunan, China

Tel and Fax: +86 734 8873719 8872942

Call: 6993

P.C. 421001

Date: NOV. 30, 2006

Page: 1/3

SPEC: ASTM A333-3002/A1008-2002; ASME B31.3/ASME B31.1-2004, PSL-1-2004, NACE MR-0175-1998														CERTIFICATE NO. 0004056					
NO.	BATCH NO.	HEAT NO.	STEEL GRADE	SIZE	BUNDLES	PIECES	FEET	QUANTITY (MT)	ACTUAL WEIGHT (MT)	CHEMICAL COMPOSITION %									
NONDESTRUCTIVE TEST										CHEMICAL COMPOSITION %									
ULTRASONIC TEST										CHEMICAL COMPOSITION %									
EDDY CURRENT TEST										CHEMICAL COMPOSITION %									
C										CHEMICAL COMPOSITION %									
0.17										CHEMICAL COMPOSITION %									
0.18										CHEMICAL COMPOSITION %									
0.20										CHEMICAL COMPOSITION %									
0.17										CHEMICAL COMPOSITION %									
0.18										CHEMICAL COMPOSITION %									
0.17										CHEMICAL COMPOSITION %									
0.19										CHEMICAL COMPOSITION %									
0.20										CHEMICAL COMPOSITION %									
0.46										CHEMICAL COMPOSITION %									
4225										CHEMICAL COMPOSITION %									
50750										CHEMICAL COMPOSITION %									
46675										CHEMICAL COMPOSITION %									
41950										CHEMICAL COMPOSITION %									
46675										CHEMICAL COMPOSITION %									
46100										CHEMICAL COMPOSITION %									
58150										CHEMICAL COMPOSITION %									
42775										CHEMICAL COMPOSITION %									

REMARKS: 1. We hereby certify that the material has been manufactured, sampled, tested and inspected in accordance with the required standards.

2. Properties compliances to DIN 50049 3.1, BUNEN 10204 3.1B.

3. BRINELL / Rockwell hardness certified to NACE MR-0175-99.

4. SPECIMEN SIZE: (Pipe end, Longitudinal, Gauge Length=2')

A. For pipes < 1" full length specimen were used.

B. For pipes > 1" longitudinal strip specimen were used; the width of the gauge length portion is 3/4".

5. Origin: Made in China.

6. MATERIALS CONFORM TO ANSI B36.10 A-530/A-530M

CRIMTECH SERVICES LTD.
MATERIAL CONFORMS TO: ASME
SECTION II, 2004 EDITION, 2004 ADDENDUM

MAY 15 2007

QUALITY MANAGER By: *[Signature]*

P.O. No.

57.

MAVERICK PONDOKA

MAY-15-2007 11:06

4" 150[±] STD WUFF SAID5N
HT#35763



MATERIAL TEST DEPARTMENT

$$= 0.0027; 1.006 \text{ PSI} =$$

PRACO LIMITED
CASTLE HOUSE - STATION ROAD
NEW BARNET HERTFORD GR

CERTIFICATO DI COLLAUDO

N.:	2439/	29/06/2005
INVOICE / FATTURA:	2244/	28/06/2005
S.:	42137	
DEL. NOTE / BOLLA:	3906/	28/06/2005

ANALYSIS MATERIALS DEPARTMENT

PAGE 7

SALA PROVE ED ANALISI MATERIALI

HEAT CODE COD. COLATA	HEAT COLATA	ITEM POS.	YOUR P.O. VS. ORDINE	OUR REFERENCE VS. ORDINE	QUANTITY QUANTITA'	DESCRIPTION DESCRIZIONE	DIM. ACCORDANCE TO DIM. IN ACCORDO A	VISUAL & DIMENSIONAL VISIVO E DIMENSIONALE
35763		0002	16887*CT	05002129 0019	150	W/N 150 RP 4" STD A105 7534213	ASME/ANSI B16.5	SATISFACTORY
35728		0016	16887*CT	05002129 0047	108	W/N 600 RP 3" STD A105 7530080	ASME/ANSI B16.5	SATISFACTORY
73623		0005	16887*CT	05002129 0025	243	THRD 150 RP 2" A105 7535465	ASME/ANSI B16.5	SATISFACTORY
70009		0005	16887*CT	05002129 0025	197	THRD 150 RP 2" A105 //	ASME/ANSI B16.5	SATISFACTORY
70009		0005	16887*CT	05002129 0025	440	THRD 150 RP 2" A105 //	ASME/ANSI B16.5	SATISFACTORY
37856		0006	16750*CT	04001850 0027	48	W/N 300 RP 6" STD A105 7534671	ASME/ANSI B16.5	SATISFACTORY

HEAT CODE COD. COLATA	HEAT COLATA	ITEM POS.	MATERIAL MATERIALE	C %	SI %	Mn %	S %	P %	Cr %	Ni %	Mo %	Ti %	Cu %	V %	Nb %	N %	Al %	C.E. %	ORIGIN ORIGINE
35763		0002	ASTM A 105	0.190	0.210	1.150	0.015	0.015	0.110	0.060	0.010	0.019	0.150	0.021	0.001	0.000	0.025	0.470	EUROPE
35728		0016	ASTM A 105	0.185	0.200	1.160	0.014	0.016	0.160	0.070	0.010	0.018	0.170	0.027	0.000	0.000	0.025	0.433	EUROPE
73623		0005	ASTM A 105	0.200	0.220	1.070	0.012	0.010	0.070	0.050	0.010	0.022	0.140	0.024	0.002	0.000	0.026	0.411	EUROPE
70009		0005	ASTM A 105	0.185	0.200	0.960	0.017	0.016	0.120	0.070	0.010	0.014	0.240	0.003	0.001	0.000	0.005	0.392	EUROPE
70009		0005	ASTM A 105	0.185	0.200	0.960	0.017	0.016	0.120	0.070	0.010	0.014	0.240	0.003	0.001	0.000	0.005	0.392	EUROPE
37856		0006	ASTM A 105	0.190	0.220	1.050	0.015	0.012	0.160	0.060	0.010	0.017	0.130	0.024	0.001	0.000	0.025	0.416	EUROPE

HEAT CODE COD. COLATA	HEAT COLATA	ITEM POS.	TEST SPECIMEN Samp. PROPERT. and Samp. Tensile	YIELD POINT Sovrammento Altim. F 0.2 %	TOTAL STRENGTH Rottura Rottura %	ELONGATION Allungamento % L	REDUCT. OF AREA Contrazione % Z	IMPACT TEST TPO ISO 17819	IMPACT TEST Resistenza Joule / cm ²	SAWP FORNA 1-0-3-0	S	W	X	YIELD POINT Sovrammento Altim. F 0.2 %
35763		0002	126.60	50.80	376.0	532	28.0	59.0	163-165	0.0	0.0	0.0	0.0	0.0
35728		0016	126.60	50.80	375.0	534	29.0	59.0	163-165	0.0	0.0	0.0	0.0	0.0
73623		0005	126.60	50.80	309.0	519	34.0	65.0	159-163	0.0	0.0	0.0	0.0	0.0
70009		0005	126.60	50.80	334.0	539	34.0	60.0	163-165	0.0	0.0	0.0	0.0	0.0
70009		0005	126.60	50.80	334.0	539	34.0	60.0	163-165	0.0	0.0	0.0	0.0	0.0
37856		0006	126.60	50.80	375.0	522	28.0	56.0	159-161	0.0	0.0	0.0	0.0	0.0

HEAT CODE COD. COLATA	HEAT COLATA	ITEM POS.	MATERIAL IN ACCORDANCE TO MATERIALE IN ACCORDO A	HEAT TREATMENT TRATTAMENTO TERMICO
35763		0002	ASTM/ASME A 105/SA 105 N - 02	ELECTRIC PURNACE
35728		0016	ASTM/ASME A 105/SA 105 N - 02	ELECTRIC PURNACE
73623		0005	ASTM/ASME A 105/SA 105 N - 02	ELECTRIC PURNACE
70009		0005	ASTM/ASME A 105/SA 105 N - 02	ELECTRIC PURNACE
70009		0005	ASTM/ASME A 105/SA 105 N - 02	ELECTRIC PURNACE
37856		0006	ASTM/ASME A 105/SA 105 N - 02	ELECTRIC PURNACE

NOTE

MATERIAL IN ACCORDANCE WITH NACE MR-0175/2003

By: LOA

QUALITY CONTROL DEPARTMENT
UFFICIO CONTROLLO QUALITA'

INSPECTION AUTHORITY
ENTE UFFICIALE COLAUDO

MANUFACTURER'S SYMBOL
MARCHIO PRODUZIONE

BRACCHI FLAVIO

(MFF)



Material Test Report

Heat Code: XCI

An Ameri-Forge Group Company

13770 Industrial Rd., Houston, TX 77015

ISO 9001:2000 Certified

Sales: (713) 868-4421 Fax: (713) 455-8366

CCTF-EDMONTON	PO: PO#4878305	Sales Order: 55402	Line: 1
5407 53RD AVENUE	Item Code: 015130C101-0021F	Qty Shipped: 224	
168332 EDMONTON ALB	Item Desc: FIG-03-00-G150-WN-RF-STB-A105-NRM-COFFR		
CN	Supplier: SMI	Supplier Heat: 25269C	
Spec: ASTM A 105/A 105M-03/ASME SA 105/SA 105M-04 Normalized 7533993			

Element	(%wt)	Ladle	Product	EPCRA	CAS#	Element	(%wt)	Ladle	Product	EPCRA	CAS#
C	Carbon	0.21 ✓				Ni	Nickel	0.03 ✓		✓	7440-02-0
Mn	Manganese	0.90 ✓		✓	7439-96-5	Cr	Chromium	0.09 ✓		✓	7440-47-3
P	Phosphorus	0.006 ✓				Mo	Molybdenum	0.020 ✓			
S	Sulphur	0.015 ✓				V	Vanadium	0.002 ✓			
Si	Silicon	0.20 ✓				Co	Cobalt	0.001 ✓			
Cu	Copper	0.27 ✓		✓	7440-50-8	C.E.		0.40			

Mechanical		Heat Treat	
Test Lab	AFG	Norm. Temp. (F)	1675
Test Bar Size	SACRIFICIAL PIECE	Norm. (Hrs)	1.0
HBW	149-152 ✓	Norm. Cooling Type	AIR
Elg (%)	33.0 ✓	Norm. Location	AFG
RA (%)	63.0		
Tensile Specimen Size (in)	0.248 ✓	Other	
Tensile (ksi)	75.8 ✓	Country of Origin	USA (US)
Yield (ksi)	51.4 ✓	EF	Y
Gauge Length	1.00		

CRIMTECH SERVICES LTD.
MATERIAL CONFORMS TO: ASME
SEC II, 2004 EDITION, 2004 ADDENDA

MAY 29 2007

By:

No Weld repair performed. Chemical Analysis results shown are actual. Forgings are capable of passing hydrostatic test compatible with the appropriate rating. Elongation taken from a round specimen. All material supplied under this order is certified to be free of mercury contamination and no mercury bearing equipment was used in manufacturing, fabrication or testing. Yield strength was determined using the 0.2% offset method.

EPCRA Supplier Notification: This product may contain one or more toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-to-Know Act (Title III of the Superfund Amendments and Reauthorization Act of 1986) and 40 C.F.R. Part 372. Potentially reportable chemicals are indicated with a checkmark in the "EPCRA" column and a Chemical Abstract Services (CAS) registry number is provided for each such chemical in addition to the percent by weight of the chemical present in this product. It is your responsibility alone to determine whether your facility is required to submit a Toxic Release Inventory Report under EPCRA Section 313.

Certification No: 113082

Certification Date: 3/22/2007

This report is issued in compliance with the requirements of EN10204 3.1 / ISO 10274 3.1 b

Kevin Papich - Tech. Svcs Manager

PO# 130244

217



Material Test Report

Heat Code: WWL

An Ameri-Forge Group Company
13770 Industrial Rd., Houston, TX 77015

ISO 9001:2000 Certified

Sales: (713) 868-4421 Fax: (713) 455-8366

CCTF-EDMONTON	PO: PO#4878305	Sales Order: 56402	Line: 1
5407 53RD AVENUE	Item Code: 0151300101-0021F	Qty Shipped: 614	
T6B3G2 EDMONTON ALB	Item Desc: FLG 03.00 0150 WN RF STD A105	NRM COFFR	
CN	Supplier: SMI	Supplier Heat: 250969	
Spec: ASTM A 105/A 105M-03/ASME SA 105/SA 105M-04 Normalized 7533993			

Element	(%wt)	Ladle	Product	EPCRA	CAS#	Element	(%wt)	Ladle	Product	EPCRA	CAS#
C	Carbon	0.20 ✓				Ni	Nickel	0.09 ✓		✓	7440-02-0
Mn	Manganese	0.87 ✓		✓	7439-96-5	Cr	Chromium	0.08 ✓		✓	7440-47-3
P	Phosphorous	0.011 ✓				Mo	Molybdenum	0.021 ✓			
S	Sulphur	0.014 ✓				V	Vanadium	0.002 ✓			
Si	Silicon	0.19 ✓				Cb	Columbium	0.002 ✓			
Cu	Copper	0.37 ✓		✓	7440-50-8	C.E.		0.40			

Mechanical		Heat Treat	
Test Lab	AFG	Norm. Temp. (F)	1675
Test Bar Size	SACRIFICIAL PIECE	Norm. (Hrs)	4.0
HBW	156-156 ✓	Norm. Cooling Type	AIR
Elg (%)	31.0 ✓	Norm. Location	AFG
RA (%)	63.0	Other	
Tensile Specimen Size (in)	0.250	Country of Origin	USA (US)
Tensile (ksi)	77.3 ✓	EF	Y
Yield (ksi)	48.1 ✓		
Gauge Length	1.00		

CRIMTECH SERVICES LTD.
 MATERIAL CONFORMS TO: ASME
 SEC. II, 2014 EDITION, 2002 ADDENDA
 MAY 15 2007
 By: NOH
 P.O. No. _____

3" STD. WNRF 150# SA105N
HT# WWL


No Weld repair performed. Chemical Analysis results shown are actual. Forgings are capable of passing hydrostatic test compatible with the appropriate rating. Elongation taken from a round specimen. All material supplied under this order is certified to be free of mercury contamination and no mercury bearing equipment was used in manufacturing, fabrication or testing. Yield strength was determined using the 0.2% offset method.

EPCRA Supplier Notification: This product may contain one or more toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-to-Know Act (Title III of the Superfund Amendments and Reauthorization Act of 1980) and 40 C.F.R. Part 372. Potentially reportable chemicals are indicated with a checkmark in the "EPCRA" column and a Chemical Abstract Service (CAS) registry number is provided for each such chemical in addition to the percent by weight of the chemical present in this product. It is your responsibility alone to determine whether your facility is required to submit a Toxic Release Inventory Report under EPCRA Section 313.

Certification No.: 113079
 Certification Date: 3/22/2007

This report is issued in compliance with the requirements of EN10204 3.1 / ISO 10474 3.1.b

Kevin Papich - Tech Svcs. Manager

HEAT NUMBER : 37972
 TRANS AM PIPING PRODUCTS - REV'D BY:  2
 Shipment/seq #: S 6 - 1677

2-1/2" CL 300 W/N FLANGE RF STD
 BORE A105N

Machined to FF

By: 104
 P.O. No. _____

MAY 15 2007

SEC. II, 2007 EDITION, 2300 (ADDENDA)

NOTE

MATERIAL IN ACCORDANCE WITH NACE MR-0175/2007

GRIMTECH SERVICES LTD.
 MATERIAL CONFORMS TO ASME B31.1
 SEC. II, 2007 EDITION, 2300 (ADDENDA)

INSPECTION AUTHORITY ENTE DI FIDUCIA	MANUFACTURER'S SYMBOL MARCHIO PRODUZIONE
PLAVIO	(MFT)

MATERIAL IN ACCORDANCE TO
 MATERIAL F IN ACCORDO A

HEAT TREATMENT
 TRATTAMENTO TERMICO

HEAT CODE COD. COLATA		HEAT COLATA	ITEM POS.	YOUR P.O. VS. ORDINE	OUR REFERENCE N.S. ORDINE	QUANTITY QUANTITA	DESCRIPTION DESCRIZIONE	DIM. IN ACCORDO A DIM. IN ACCORDO A	VISUAL & DIMENSIONAL VISIVO E DIMENSIONALE														
31525.	36207	37972	31526.	36555.	38244	0068 0124 0026 0053 0083 0057	ROBESSED 300 RP 4" L22CL1 S/O 150 RP 4" A105 W/N 300 RP 2-1/2" STD A105 W/N 2500RJ 2" XIS SO. CUT L22CL1 W/N 1500 RP 2" 160 L22CL1 W/N 600 RP 2" XS A105	ASME/ANSI B16.5 ASME/ANSI B16.5 ASME/ANSI B16.5 ASME/ANSI B16.5 ASME/ANSI B16.5 ASME/ANSI B16.5	SATISFACTORY SATISFACTORY SATISFACTORY SATISFACTORY SATISFACTORY SATISFACTORY														
HEAT CODE COD. COLATA	HEAT COLATA	ITEM POS.	MATERIAL MATERIALE	C %	SI %	MIN %	S %	P %	Cr %	NI %	MO %	TI %	Cu %	V %	Nb %	N %	AI %	C.E. %	ORIGIN ORIGINE				
31525.	36207	37972	31526.	36555.	38244	0068 0124 0026 0053 0083 0057	ASTM A350 LF2 CL1/2 ASTM A 105 ASTM A 105 ASTM A350 LF2 CL1/2 ASTM A350 LF2 CL1/2 ASTM A 105	0.190 0.205 0.195 0.190 0.190 0.195	0.220 0.210 0.270 0.220 0.220 0.250	1.150 1.010 0.990 1.100 1.110 0.970	0.012 0.019 0.021 0.012 0.010 0.021	0.012 0.015 0.012 0.012 0.010 0.012	0.120 0.150 0.120 0.120 0.110 0.160	0.060 0.080 0.060 0.060 0.090 0.070	0.010 0.010 0.018 0.010 0.020 0.010	0.015 0.008 0.010 0.015 0.015 0.010	0.200 0.170 0.170 0.170 0.160 0.200	0.022 0.003 0.003 0.021 0.022 0.002	0.001 0.002 0.000 0.001 0.001 0.002	0.000 0.000 0.000 0.000 0.000 0.000	0.025 0.005 0.005 0.025 0.025 0.008	0.429 0.420 0.400 0.418 0.420 0.409	EUROPE EUROPE EUROPE EUROPE EUROPE EUROPE
HEAT CODE COD. COLATA	HEAT COLATA	ITEM POS.	TEST SPECIMEN SECTION	YIELD POINT Tensile Strength Yield Point Tensile Strength	ELONGATION Elongation Elongation	REDUCTION OF AREA Reduction of Area Reduction of Area	NUMBERS Numbers Numbers	REMARKS Remarks Remarks	IMPACT TEST Impact Test Impact Test	TYPE Type Type	U.S.A. U.S.A. U.S.A.	TEMP. Temp. Temp.	CHARACTERISTICS Characteristics Characteristics	SHAPE Form Form	S S S	W W W	X X X	YIELD POINT Yield Point Yield Point	ORIGIN ORIGINE ORIGINE				
31525.	36207	37972	31526.	36555.	38244	0068 0124 0026 0053 0083 0057	126.60 126.60 126.60 126.60 126.60 126.60	50.80 50.80 50.80 50.80 50.80 50.80	369.0 348.0 342.0 370.0 372.0 342.0	542 535 525 528 534 526	30.0 32.0 32.0 28.0 29.0 32.0	60.0 60.0 60.0 57.0 57.0 60.0	164-166 163-168 159-163 159-163 163-163 159-163	0.0 0.0 0.0 0.0 0.0 0.0	IV IV IV IV IV IV	67 88 88 63 60 86	60 86 84 67 60 86	68 88 85 66 63 82	1 1 1 1 1 1	0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0	EUROPE EUROPE EUROPE EUROPE EUROPE EUROPE	
HEAT CODE COD. COLATA	HEAT COLATA	ITEM POS.	ASTM/ASME A 350/SA 150 N - 04a	ASTM/ASME A 105/SA 105 N - 05	ASTM/ASME A 105/SA 105 N - 05	ASTM/ASME A 350/SA 150 N - 04a	ASTM/ASME A 105/SA 105 N - 05	HEAT TREATMENT TRATTAMENTO TERMICO	HEAT TREATMENT TRATTAMENTO TERMICO	HEAT TREATMENT TRATTAMENTO TERMICO	HEAT TREATMENT TRATTAMENTO TERMICO	HEAT TREATMENT TRATTAMENTO TERMICO	HEAT TREATMENT TRATTAMENTO TERMICO	HEAT TREATMENT TRATTAMENTO TERMICO	HEAT TREATMENT TRATTAMENTO TERMICO	HEAT TREATMENT TRATTAMENTO TERMICO	HEAT TREATMENT TRATTAMENTO TERMICO	HEAT TREATMENT TRATTAMENTO TERMICO	HEAT TREATMENT TRATTAMENTO TERMICO				
31525.	36207	37972	31526.	36555.	38244	0068 0124 0026 0053 0083 0057	NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 920 C - COOLED IN STILL AIR NORMALIZED AT 920 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR	NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 920 C - COOLED IN STILL AIR NORMALIZED AT 920 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR	NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 920 C - COOLED IN STILL AIR NORMALIZED AT 920 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR	NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 920 C - COOLED IN STILL AIR NORMALIZED AT 920 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR	NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 920 C - COOLED IN STILL AIR NORMALIZED AT 920 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR	NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 920 C - COOLED IN STILL AIR NORMALIZED AT 920 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR	NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 920 C - COOLED IN STILL AIR NORMALIZED AT 920 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR	NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 920 C - COOLED IN STILL AIR NORMALIZED AT 920 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR	NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 920 C - COOLED IN STILL AIR NORMALIZED AT 920 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR	NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 920 C - COOLED IN STILL AIR NORMALIZED AT 920 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR	NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 920 C - COOLED IN STILL AIR NORMALIZED AT 920 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR	NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 920 C - COOLED IN STILL AIR NORMALIZED AT 920 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR	NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 920 C - COOLED IN STILL AIR NORMALIZED AT 920 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR	NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 920 C - COOLED IN STILL AIR NORMALIZED AT 920 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR	NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 920 C - COOLED IN STILL AIR NORMALIZED AT 920 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR NORMALIZED AT 930 C - COOLED IN STILL AIR		

METALFAR
 PRODOTTI INDUSTRIALI S.P.A.
 23861 CESANA BRIANZA (LC) ITALY
 Tel. 031.65541 - Fax 031.655149
 MATERIAL TEST DEPARTMENT
 SALA PROVE ED ANALISI MATERIALI

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

TRANS AM PIPING PRODUCTS LTD
 7025 44TH STREET SE 720428
 CALGARY-ALBERTA

INSPECTION CERTIFICATE EN 10204/3.1

CERTIFICATO DI COLLAUDO

N. 4291/ 28/11/2006
 INVOICE / FATTURA 3846/ 27/11/2006
 S. 48030
 DEL NOTE / ROIA 6151/ 27/11/2006

2'12" 311 200" RTWN
 HT#37972
 P0130244

2" 300# S40 RFWN SA105N
HT# 100A6

TOTAL P.03

CERTIFICADO DE INSPECCION

Works Certificate - Certificat d'Usine

DINEN 10204 / 3.1
ISO 10474 / 3.1



ULMA FORJA, S.COOP.

107153
300522006
Nº
No.

FECHA: 30/05/2006
Date:

DE
at. de 17/04/2006

SU PEDIDO Nº
Your Order No.
4878574-00

FLANGES

ASME B16.5-96

NORMAS APLICABLES
Requirements - Normas Aplicable

MATERIAL CORRESPONDIENTE
ASTM A105N-05
ASME SA105N-05

MODO DE FUSION (*)
Star / Making - Elaboration de l'acier
E = Elec. Y = Oxygene Basico

NACE MR-01-75/03
CSA - Z245.12-05
GR248 CAT I

DEPARTAMENTO QUALITY ASSURANCE
Department

MARCA DEL FABRICANTE
Mark of factory
Márque du fabricant

52579

PARTIDA Item Poids	CANTIDAD Quantity Quantité	DESCRIPCION Description Description	OBSERVACIONES Remarks Observations	COLODA Nº Heat No Nº Coûble	TENSILIDAD T. Strength Tensile Strength	ALARGAMIENTO Elongation Elongation	RESILIANCIA Impact test Resilience	DUREZA Hardness Dureté
1 7533867	538	WN 2 150LB S40 RF A105N	NE	131A6	519	32.50	83.70	160
9 7530247	76	SW 3/4 150LB S80 RF A105N	NE	437A5	522	31.1	66.80	152
10-7534808	390	WN 2 300LB S40 RF A105N	NE	100A8	519	33.50	66.80	150
41 7532040	4	BLIND 6 800LB RTJ A105N	NE	130RB	521	35.00	66.30	152

COMPOSICION QUIMICA - STEEL MARKER'S LADLE ANALYSIS - ANALYSE CHIMIQUE

COLODA Nº Heat No Nº Coûble	C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	Nb %	V %	Cu %	CEQ %
100A8	0.180	0.220	0.840	0.010	0.005	0.080	0.080	0.050	0.007	0.002	0.180	0.384
131A6	0.200	0.150	1.050	0.018	0.005	0.020	0.080	0.040	0.001	0.001	0.120	0.365
130RB	0.170	0.240	1.180	0.014	0.008	0.080	0.070	0.010	0.001	0.001	0.190	0.399
437A5	0.190	0.170	1.020	0.008	0.016	0.050	0.150	0.020	0.001	0.002	0.190	0.397

(*) OBSERVACIONES: N₂ NORMALIZED AT 900 C AND ALLOWED TO COOL IN STILL AIR
Remarks
Observations

EL INSPECTOR
Works Inspector - L'inspecteur

ULMA FORJA, S.COOP.
Dpto. de Control de Calidad
Quality Assurance Dept.
ULMA FORJA, S.COOP. LTD.
Dpto. de Control de Calidad
Quality Assurance Dept.

ULMA FORJA, S.COOP. LTD.
Dpto. de Control de Calidad
Quality Assurance Dept.

MAY 18 2007

104

2" STD BEETLEFWN SAIDS
HT#75342

Po# 130244



FORGED FLANGES & FITTINGS LTD
CASTLE HOUSE - STATION ROAD
NEW BARNET/HERTFY. GB

INSPECTION CERTIFICATE EN 10204/3.1

CERTIFICATO DI COLLAUDO

N.:	353/	30/01/2006
INVOICE / FATTURA:	277/	27/01/2006
S.:	4348	
DEL. NOTE / BOLLA:	458/	27/01/2006

FOR

SALA PROVE ED ANALISI MATERIALI

HEAT CODE COD. COLATA	HEAT COLATA	ITEM POS.	YOUR P.O. VS. ORDINE	OUR REFERENCE VS. ORDINE	QUANTITY QUANTITÀ	DESCRIPTION DESCRIZIONE	DIM. ACCORDO TO DIM. IN ACCORDO A	VISUAL & DIMENSIONAL VISIVO E DIMENSIONALE											
75342		0010	3142	06000094 0028	159	W/N 600 RF 2" STD A105 7530064	ASME/ANSI B16.5	SATISFACTORY											
HEAT CODE COD. COLATA	HEAT COLATA	ITEM POS.	MATERIAL MATERIALE																
75342		0010	ASTM A 105	0.185	0.200	0.920	0.021	0.011	0.090	0.050	0.010	0.002	0.140	0.001	0.000	0.000	0.012	0.371	EUROPE
HEAT CODE COD. COLATA	HEAT COLATA	ITEM POS.	TEST SPECIMEN mm INCH	YIELD POINT Sovranoscarica N/mm² / PSI	TENSILE STRENGTH Rupture N/mm² / PSI	ELONGATION Allungamento %	REDUCTION OF AREA Riduzione Area %	MACHINERY Durezza HB	BEND TEST Piegatura	IMPACT TEST Schlagen Joule / cm²	SHAPE FORZA 1.0 2.0	S	W	X	YIELD POINT Sovranoscarica N/mm² / PSI	OUR REF			
75342		0010	126-60-50-80	358.0	520	31.0	58.0	156-159	0.0	20 85 88	1				0.0				
HEAT CODE COD. COLATA	HEAT COLATA	ITEM POS.	MATERIAL IN ACCORDANCE TO MATERIALE IN ACCORDO A																
75342		0010	ASTM/ASME A 105/SA 105 K - 02																
			VERIFIED TRUE COPY OF ORIGINAL FORGED FLANGES & FITTINGS LIMITED																
			MATERIAL CONFORMS TO: ASME SEC. II, 2004 EDITION, 2002 ADDENDA MAY 15 2007																
			HORIZONTAL TECH SERVICES LTD. ELECTRIC FURNACE																
NOTE			QUALITY CONTROL UFFICIO CONTROLLO	DEPARTMENT CONFERITA	INSPECTION AUTHORITY ENTE UFFICIALE	MANUFACTURER'S SYMBOL MARCHIO PRODUTTORE													
LF2: CHARPY TEST SPECIMEN RESULT AS 10X10MM MATERIAL IN ACCORDANCE WITH NACE MR-0175/2003			BRACCHI FLAVIO		P.O. No.														
X20 -2006																			

88

3" S40 90° ELBOW SA234 WPB
HT#07C00004

PC# 130244



INSPECTION CERTIFICATE

Thai Benkan Co., Ltd.
58 Soi Wakkana, Bangkok, Prapacheng,
Samutprakarn, 10130 Thailand.

Purchaser: CCTE CORPORATION

E-No. MA-898 Purchase Order No. 4879147 Job No.

TO EN10204 3.1

D M Y Certificate No.

28/03/2007 T-2007200184

MA-898		4879147		Specification for Material Made from Seamless Pipe										Specification for Inspection		Visual Examination		Dimensional Inspection	
No.		MFG. No. (Heat Identification No.)		ASTM A234-05/ASME SA234 WPB CSA Z245.11 GR241 CAT I NACE MR0175-2003										ASME B16.9-2003		Good		Good	
				Product & Size										Quantity		Heat Treatment (Note 1)		Symbol No.	
1		07B00003		90 EL WPB 3 S40										362/500		A		7510381	
2		07C00004		90 EL WPB 3 S40										138/500		A		7510381	
3		07B00066		90 EL WPB 8 S40										96		A		7510489	
4		07B00064		90 EL WPB 10 S40										63/105		A		7510513	
5		07C00011		90 EL WPB 10 S40										42/105		A		7510513	
Specification		Chemical Composition %										Tension Test #2							
Min.		C	Si	Mn	P	S	Cu	Ni	Cr	Mo	V	Nb	C.E.	YS	TS	E			
Max.		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.	%			
Material Heat No.																HARDNESS MAX			
1		23														197 HB : GOOD			
2		46200														CRIMTECH SERVICES LTD. MATERIAL CONFORMS TO: ASME SEC. II, 2007 EDITION, 2007 ADDENDA			
3		68M5565														MAY 15 2007			
4		J6L1373														4 By			
5		J5L9228														4 By			
6		J5LC442														4 By			

CRIMTECH SERVICES LTD.
MATERIAL CONFORMS TO: ASME
SEC. II, 2004 EDITION, 2004 ADDENDUM

MAY 15 2007

(Note 1) A: Hot formed with final temperature between 620°C-980°C, 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

C.E. = C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15

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

Quality Assurance Manager
Thai Benkan Co., Ltd.

68

HEAT: 07B00002 SKU: 7510381 DESC: 3 STD LR 90 WELD ELL WPB

PO# 30244

Purchaser: CCTF CORPORATION

INSPECTION CERTIFICATE



Thai Benkan Co., Ltd.
58 Sol Watkrual, Bangken, Trapsadeng,
Srinakharinwirot, 10130 Thailand.

E.No. MA-841 Purchase Order No. 4876697 Job No.

TO ENI0204 3.1

D M Y Certificate No.
05/03/2007 T-2007200171

No.	Specification for Material		Specification for Inspection		Visual Examination		Dimensional Inspection	
	MFG. No. (Heat Identification No.)	Product & Size	Quantity	Heat Treatment (Note 1)	Symbol No.			
1	07B000005	90 EL WPB 4 S40	391/1,000	A	7510420		Good	Good
2	07A000039	90 EL WPB 6 S40	19/640	A	7510462			
3	07A000052	45 EL WPB 6 S40	121/320	A	7511299			
4	07B000002	90 EL WPB 3 S40	500	A	7510381			
5	07B000008	90 EL WPB 6 S40	129/640	A	7510462			

Specification	Chemical Composition %												Tension Test *2	
	C	Si	Mn	P	S	Cr	Ni	Mo	V	Nb	C.E.	YS	TS	F
Mfn.	X 100	X 100	X 100	X 1000	X 1000	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	58	40	40	40	15	80	20			655	
1 49523	20	19	66	12	1	2	3	2	1	1	32	294	466	31
2 JSLC314	18	22	69	13	8	3	5	1	0	0	31	299	476	40
3 J6K3341	19	19	70	15	5	1	2	0	0	0	32	309	488	39
4 48949	20	21	67	11	2	3	4	1	1	2	33	288	472	32
5 J6KB407	19	20	71	14	5	2	2	0	0	0	32	290	480	38

CRIMP SERVICES LTD.
MATERIALS DEPT. FORMS TO: ASME
SEC. II, 2007 EDITION ADDENDA

MAY 15 2007

By: *[Signature]*

(Note 1) A: Heat treated 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 metal N: 3.1B-Relieving 675°Cx0.5 HR. Air Cooling)

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

Quality Assurance Manager
Thai Benkan Co., Ltd.

* 1. "RT" symbolized with thickness in mm * 2. YS Yield strength TS = Tensile strength F = Elongation

FEB 27 2006

110AU 6133697

4th 5K2446



INSPECTION CERTIFICATE

PURCHASER: SEYBOLD

ASTM A234 WPB-02

ASME SA234 WPB-01

STANDARD

CSA Z45.11 Gr.241 Cat I

MATERIALS: ASTM A106 Gr.B / JIS G3103 SB410

INSP. SPEC.: ASME B16.9 - 01

DATE: 2006 - 01 - 27

ORDER NO: 5208/14025980R2100

P.I. NO: 5J04-3

CERTIFI. NO: 046

8. MEI-CHUNG RD. NIAO-SONG,
KAOHSIUNG HSIEN, 83301 TAIWAN
TEL: 886-77310527-8
FAX: 886-77315887

ACCORDING TO EN10204/DIN50049/3.1B

ITEM NO.	PRODUCT & SIZE	QUANTITY PCS	MFG NO.	VISUAL & DIMENSIONAL INSPECTION	HARDNESS MAX. 197 HB	HEAT TREATMENT (NOTE)	MAGNETIC PARTICLE EXAMINATION	IMPACT TEST (J)
1	CAP 2" XH	150	5K5820	GOOD	133 - 138	N		117174
2	CAP 2.1/2" STD	30	5I2494	GOOD	133 - 137	N		1173083
3	CAP 4" XH	100	5K6221	GOOD	134 - 167	N		1175751
4	ELL 45 LR 2" STD	200	5K2346	GOOD	133 - 134	A		1171194
5	ELL 45 LR 3" XH	175	5J1748	GOOD	133 - 134	A		1175347
6	ELL 45 LR 6" STD	100	5B103	GOOD	132 - 133	A		1171258
7	ELL 90 LR 2" STD	513	6A0546	GOOD	133 - 134	A		1171251
8	ELL 90 LR 2" STD	386	5K2446	GOOD	132 - 132	A		1171251
9	ELL 90 LR 2" XH	122	5F2718	GOOD	133 - 134	A		1171251
10	ELL 90 LR 2" XH	646	5J6182	GOOD	130 - 132	A		1171251

CHEMICAL COMPOSITION %

ITEM NO.	MATERIAL CHARGE NO.	C	Si	Mn	P	S	Cu	Ni	Cr	Mo	V	Nb	Y S	T S	E	C.E.
		x100	x100	x100	x1000	x1000	x100	x100	x100	x100	x100	x1000	KSI	KSI	%	X100
	STANDARD	MIN.	MAX.										35.0	60.0		
1	3Y720	16	24	75	19	58	40	40	15	8	20	0	48.9	68.2	27.7	28
2	2S694	18	20	72	17	5	0	1	0	0	0	0	46.6	65.6	28.1	30
3	3Y721	18	23	78	16	6	0	1	0	0	0	0	42.7	65.9	27.5	31
4	503046	21	22	49	9	35	15	5	3	1	0	0	47.9	71.1	36.0	31
5	J5K4248	11	26	124	12	4	3	3	5	1	0	0	45.1	67.6	65.0	33
6	307703	13	17	82	9	3	7	3	3	1	0	2	42.4	64.1	40.0	28
7	503046	21	22	49	9	35	15	5	3	1	0	0	47.9	71.1	36.0	31
8	503046	21	22	49	9	35	15	5	3	1	0	0	47.9	71.1	36.0	31
9	503118	20	21	50	12	6	15	5	6	1	0	0	47.2	68.9	36.0	31
10	J5L3682	11	22	134	6	5	3	2	12	1	0	0	46.8	67.7	56.0	36

(NOTE) A: HOT FORMED WITH FINAL TEMPERATURE BETWEEN 620°C-980°C, AIR COOLING
N: NORMALIZING AT TEMPERATURE 880°C X 0.5 HR, AIR COOLING.

NACE MR-01-75 & NACE MR 0103: 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.

CRIMTECH SERVICES LTD.

MATERIAL CONFORMS TO: ASME

SECTION VIII, DIVISION 1, EDITION 2001, PART 1, SUBPART 1

MAY 15 2007

MANAGER OF Q.A. DEPT.

By: *104*

P.O. No.

E Lan

FEB 27 2006

2" LR 90° Elbow STD. SA234 WPB-02
110 AU 0133697

HT# 6A0546



INSPECTION CERTIFICATE

PURCHASER: SEYBOLD

ASTM A234 WPB-02

ASME SA234 WPB-01

CSA Z45.11 Gr.241 Cal I

MATERIALS: ASTM A106 Gr.B / JIS G3103 SB410

INSP. SPEC.: ASME B16.9 - 01

RIGID INDUSTRIES CO., LTD.

8, MEI-CHUNG RD. NIAO-SONG,

KAOHSIUNG HSIEN, 83301 TAIWAN

TEL: 886-77310527~8

FAX: 886-77315887

DATE: 2006-01-27

ORDER NO: 5208/1402598OR2100

P.I. NO: 5J04-3

CERTIFI. NO: 046

ACCORDING TO EN10204/DIN50049/3.1B

ITEM NO.	PRODUCT & SIZE		QUANTITY PCS	MFG NO.	VISUAL & DIMENSIONAL INSPECTION	HARDNESS MAX. 197 HB	HEAT TREATMENT (NOTE)	MAGNETIC PARTICLE EXAMINATION	IMPACT TEST (J)	P.O. No.
1	CAP	2"	XH	150	5K5820	GOOD	133 - 138	N		
2	CAP	2.1/2"	STD	30	512494	GOOD	133 - 137	N		
3	CAP	4"	XH	100	5K6221	GOOD	134 - 167	N		
4	ELL 45 LR	2"	STD	200	5K2346	GOOD	133 - 134	A		
5	ELL 45 LR	3"	XH	175	5J1748	GOOD	133 - 134	A		
6	ELL 45 LR	6"	STD	100	513103	GOOD	132 - 133	A		
7	ELL 90 LR	2"	STD	513	6A0546	GOOD	133 - 134	A		
8	ELL 90 LR	2"	STD	386	5K2446	GOOD	132 - 132	A		
9	ELL 90 LR	2"	XH	122	5F2718	GOOD	133 - 134	A		
10	ELL 90 LR	2"	XH	646	5J6182	GOOD	130 - 132	A		

ITEM NO.	MATERIAL CHARGE NO.	CHEMICAL COMPOSITION %										PHYSICAL TEST				
		C x100	Si x100	Mn x100	P x1000	S x1000	Cu x100	Ni x100	Cr x100	Mo x100	V x100	Nb x1000	Y S	T S	E	C.E.
													KSI	KSI	%	X100
		MIN.	MAX.													
1	3Y720	16	24	75	19	7	0	0	1	0	0	0	48.9	68.2	27.7	28
2	2S694	18	20	72	17	5	0	1	0	0	0	0	46.6	65.6	28.1	30
3	3Y721	18	23	78	16	6	0	1	1	0	0	0	42.7	65.9	27.5	31
4	503046	21	22	49	9	35	15	5	3	1	0	0	47.9	71.1	36.0	31
5	J5K4248	11	26	124	12	4	3	3	5	1	0	0	45.1	67.6	65.0	33
6	307703	13	17	82	9	3	7	3	3	1	0	2	42.4	64.1	40.0	28
7	503046	21	22	49	9	35	15	5	3	1	0	0	47.9	71.1	36.0	31
8	503046	21	22	49	9	35	15	5	3	1	0	0	47.9	71.1	36.0	31
9	503118	20	21	50	12	6	15	5	6	1	0	0	47.2	68.9	36.0	31
10	J5L3682	11	22	134	6	5	3	2	12	1	0	0	46.8	67.7	56.0	36

CRIMECH SERVICES LTD.									
MATERIAL CONFORMS TO: ASME									
SEC II, DIV 1, PART 1, 2007 EDITION, 2007 ADDENDA									
MAH 27.2007									
157571									
157571									

(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 & NACE MR 0103 : 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.

Ou L Lan

MANAGER OF Q.A. DEPT.

Ref: 130244

HC



Thai Benkan Co., Ltd.
58 Soi Walkrunai, Bangkok, Prapadaeng,
Samutprakarn, 10130 Thailand.

INSPECTION CERTIFICATE

Purchaser : CCTF CORPORATION

E.No. MA-709 Purchase Order No. 4877569 Job No.

TO EN10204 3.1


D M Y Certificate No.

18/10/2006 T-2006201017

No.	MFG. No. (Heat Identification No.)	Specification for Material Made from Seamless Pipe		Specification for Inspection		Visual Examination	Dimensional Inspection
		ASTM A234-05a/ASME SA234 WPB CSA Z245.11 GR241 CAT I NACE MR0175-2003	ASME B16.9-2003	Quantity	Heat Treatment (Note 1)		
		Product & Size	(T x D)	Quantity		Symbol No.	
1	05A10118	WT WPB 2 S40		276/500	S	7511736	
2							
3							
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	58	40	40	40	15	80	20			655		

1	J5K5221	19	21	55	13	1	2	2	4	0	0	0	29	313	484	61
2																
3																
4																
5																

GRIMTECH SERVICES LTD															
MATERIAL CONFORMS TO: ASME															
SEC. II, 2007 EDITION 2006 ADDENDUM															
MAY 15 2007															
By: 															
P.O. No.															

(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°C X0.5 HR. Air Cooling

C.E. = C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15

MAGNETIC PARTICLE EXAMINATION FOR TEE ONLY : GOOD

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

Quality Assurance Manager
Thai Benkan Co.,

25

2" S40 SA234WPB Tee
#7# 06N10616

PO#130244



Thai Benkan Co., Ltd.
58 Soi Wukrunai, Bangkru, Prapadaeng,
Samutprakarn, 10130 Thailand.

D M Y Certificate No.

INSPECTION CERTIFICATE

Purchaser : GCTE CORPORATION

TO EN10204 3.1

E-No. Purchase Order No. Job No.

MA-805 4878473

08/01/2007 T-2007200034

MFG. No. (Heat Identification No.)		Specification for Material Made from Seamless Pipe				Specification for Inspection		Visual Examination		Dimensional Inspection	
No.		ASTM A234-05a/ASME SA234 WPB CSA 2245.11 GR241 CAT I NACE MR0175-2003				ASME B16.9-2003		Good		Good	
		Product & Size				Quantity		Heat Treatment (Note 1)		Symbol No.	
1		T WPB 2 S40				250/500		S		7511736	
2		T WPB 2 1/2 X 2 S40				20		S		7512481	
3		T WPB 2 S40				199/500		S		7511736	
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	58	40	40	40	15	80	20		655			
1	J5K7128	18	18	56	12	8	3	3	5	2	0	1	29	295	462	56	
2	32583	20	18	70	8	2	4	2	3	3	2	1	34	348	500	32	
3	J5K5221	19	21	55	13	1	2	2	4	0	0	0	29	313	484	61	
4																	
5																	

CRIMTECH SERVICES LTD

MATERIAL CONFORMS TO: ASME

SEC. II, 2007 EDITION

MAY 15 2007

By: ADH

P.O. No. _____

CRIMTECH SERVICES LTD.
MATERIAL CONFORMS TO: ASME
SEC. II, 2004 EDITION 2004 ADDENDUM

MAY 15 2007

By: [Signature]

P.O. No.

(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

C.E. = C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15

MAGNETIC PARTICLE EXAMINATION FOR TEE ONLY

We hereby certify that the product described herein has been manufactured in accordance with the specifications concerned

I also with the purchaser's requirements and that the test results shown herein are correct.

1. 1/4" symbolized wall thickness in mm * 2. V.C. Yield strength TS - Tensile strength E - Elongation

Quality Assurance Manager
Thai Benkan Co., Ltd.

4" X 3" SA234WPB S40 RC

PO#130244

HT# 06100069



Thai Benkan Co., Ltd.
58 Soi Watrunai, Bangkok, Prapadaeng,
Samutprakarn, 10130 Thailand.

INSPECTION CERTIFICATE

Purchaser: CCIF CORPORATION

E.No. MA-572 Purchase Order No. 4020609 Job No.

D M Y Certificate No.
02/06/2006 T-2006200543

TO EN10204 3.1

No.	MFG. No. (Heat Identification No.)	Specification for Material Made from Seamless Pipe		Specification for Inspection		Visual Examination	Dimensional Inspection									
		ASTM A234-05/ASME SA234 WPB CSA Z245.11 GR241 CAT 1 NACE MR0175-2003	ASME B16.9-2003	Good	Good											
		Product & Size (T x I)		Quantity	Heat Treatment (Note 1)	Symbol No.										
1	06C20002	RC WPB 3 X 2 S40		60	N	7513178										
2	06D20069	RC WPB 4 X 3 S40		200	N	7513330										
3	06A20010	RC WPB 4 X 2 1/2 S40		17/30	N	7513356										
4	06D20070	RC WPB 4 X 2 1/2 S40		13/30	N	7513356										
5	05K20007	RC WPB 4 X 1 1/2 S40		15	N	7513399										
Specification		Chemical Composition %										Tension Test #2				
Min.	Max.	C	Si	Mn	P	S	Cu	Ni	Cr	Mo	V	Nb	C.E.	YS	TS	E
		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.	%
			10	29										240	415	30
		23		106	50	58	40	40	40	15	80	20			655	
1	82014	16	27	76	10	6	23	12	9	2	1	0	33	280	457	35
2	331409	14	20	105	14	1	2	3	11	1	0	0	34	314	470	37
3	37152	19	18	70	14	4	8	6	7	3	1	1	34	331	483	38
4	331409	14	20	105	14	1	2	3	11	1	0	0	34	314	470	37
5	47078	19	22	64	12	1	6	2	3	1	1	1	31	312	471	40
Material Heat No.		GRINTECH SERVICES LTD										MATERIAL CONFORMS TO: ASME				
		SEC. II, 2002 EDITION, 2002 ADDENDUM										MAY 15 2007		By: <i>ADA</i>		
														P.O. No.		

(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

C.E. = C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15

MAGNETIC PARTICLE EXAMINATION FOR TEE ONLY

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.

Quality Assurance Manager
Thai Benkan Co., Ltd.

INSPECTION CERTIFICATE

RIGID INDUSTRIES CO., LTD.

PURCHASER: SEYBOLD
ASTM A234 WPB-06
ASME SA234 WPB-01

DATE: 2007 - 01 - 18

ORDER NO: 6091/4021744

P.I. NO: 6J1B-1

MATERIALS: ASTM A106 Gr.B / JIS G3103 SB410

INSP. SPEC: ASME B16.9 - 03

8. MEI-CHUNG RD. NIAO-SONG
KAOHSIUNG HSIEN, 83301 TAIWAN
TEL: 886-77310527-8
FAX: 886-77315887

CERTIFI. NO: 037

EXAMINER: MECH SERVICES LTD.
MATERIAL CONFORMS TO: ASME
SEC. II, 20% EDITION, 2000 ADDENDA
MAY 17 2007
By: [Signature]
P.O. No. [Blank]
GOOD

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)
11	CON-RED 2X1"	STD 7510195 50	6G5503	GOOD	124 - 132	N		
12	CON-RED 2X1 1/2"	160 7516193 15	6C3633	GOOD	160 - 173	N		
13	CON-RED 2.1/2X1.1/2"	STD 7513088 50	6H3712	GOOD	126 - 153	N		
14	CON-RED 2.1/2X2.1/2"	STD 7513623 150	6I0715	GOOD	136 - 153	N		
15	CON-RED 3.1/2X2.1/2"	STD 7513275 15	4C733X	GOOD	120 - 148	N		
16	CON-RED 3.1/2X3"	STD 7513259 20	5H241V	GOOD	131 - 136	N		
17	CON-RED 6X5"	STD 7513526 40	6I9051	GOOD	125 - 138	N		
18	CON-RED 10X4"	STD 7513852 42	6E2583	GOOD	130 - 141	N		
19	ECC-RED 10X5"	STD 7515316 5	6G10154	GOOD	120 - 128	N		
20	RED-TEE 2.1/2X1.1/4"	XH 7513407 5	6L0782	GOOD	100 - 126	N		

ITEM NO.	MATERIAL CHARGE NO.	CHEMICAL COMPOSITION %										PHYSICAL TEST			
		C x100	Si x100	Mn x100	P x1000	S x1000	Cu x100	Ni x100	Cr x100	Mo x100	V x100	Nb x1000	Y S KSI	T S KSI	E %
11	314503	17	24	59	8	7	5	2	3	<1	<1	20	45.0	88.6	33.5
12	J5K7433	12	25	128	17	4	3	2	5	<1	<1	<1	47.4	69.2	60.0
13	100712	20	25	56	9	8	1	2	2	<1	<1	<1	48.0	72.6	32.5
14	0525615	20	34	45	19	7	12	4	4	<1	<1	<1	50.8	78.4	35.0
15	3X	19	22	50	15	13	2	4	6	<1	<1	<1	45.0	74.7	32.6
16	51V	21	23	43	15	11	15	6	4	<1	<1	<1	45.0	71.1	33.0
17	0631751	18	26	68	12	5	9	5	7	2	<1	<1	50.1	81.3	36.0
18	P522283	19	23	53	16	28	2	2	2	1	<1	<1	47.2	71.8	35.0
19	05954	20	21	43	18	13	5	2	3	1	<1	<1	43.5	66.7	30.0
20	J533382	9	29	124	14	5	1	2	6	2	<1	<1	45.5	66.6	69.0
															50
															27
															34
															29
															29
															28
															30
															32
															28
															28
															31

(NOTE): A: HOT FORMED WITH FINAL TEMPERATURE BETWEEN 820°C-980°C, AIR COOLING.
N: NORMALIZING AT TEMPERATURE 880°C X 0.5HR, AIR COOLING.

NACE MR-01-75 & NACE MR 0103 : 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.

Ou E Lan

MANAGER OF Q.A. DEPT.

10488

Abnahmeprüfzeugnis nach EN 10204 - 3.1
Inspection certificate acc. to EN 10204 - 3.1Zeugnis-Nr./Certificate No. CA - 49333950
Seite/Page 1 von/of 1

Es wird bescheinigt, dass die gelieferten Erzeugnisse den Vereinbarungen bei der Bestellung entsprechen. Darüber hinaus wird bescheinigt, dass bei der Herstellung der nachstehend aufgeführten Erzeugnisse die vorgeschriebenen Prüfungen und/oder die zusätzlich aufgeführten Prüfungen nach den bestehenden Prüfvorgaben durchgeführt und die erforderlichen Freigaben erteilt wurden. Die unten aufgeführten Prüfungen wurden unter Aufsicht einer dazu autorisierten, unabhängigen Stelle durchgeführt.

It is certified that the products supplied are in compliance with the requirements of the order. Furthermore, it is confirmed that during the manufacturing of the subsequently listed products the specified inspections and/or the additionally ordered tests have been performed according to the valid procedures and the necessary releases have been given. The subsequently listed inspections have been performed by especially authorized personal.

Kunde/Customer : -
Kunden Bestell-Nr./Customer Order No. : -
E+H-Auftrags-Nr./E+H Order No. : 46550000

Pos./Item	Menge/Qty.	Produktbezeichnung/Description
250	1	72F15-SM0AA4PAB4AA PROWIRL 72 F 1/2" S/N.: 93038D16000 Tag-Nr.: FOIT-100

Abnahmeprüfzeugnis nach EN 10204 - 3.1/Inspection Certificates acc. to EN 10204 - 3.1:

Grundkörper/Meter body: D726, Uni Deritend
Prozessanschluss/Process connection: 192106, Neumayer
Schraube/Screw: CR (M5X12), Bossard AG
Elektroden/Electrodes: 242904, 242343, Kurt Schneider AG

Datum/Date 05-11-2007

Endress+Hauser Flowtec, Division USA
Greenwood, IN 46143 USA

Jeff Griffin

Abnahmebeauftragter
Inspector

Dieses Dokument wurde elektronisch nach EN 10204 erstellt und ist ohne Unterschrift gültig.
This document was generated electronically acc. to EN 10204 and is valid without signature.

93038D16000

Endress+Hauser
People for Process Automation

Unsere Beleg-Nr.: 10024804
 Our Reference No.:
 Auftr./Bestell-Nr.:
 Com./Order No.:

[illegible]

Anlagen:	Ort:	Datum:	Unterschrift:	Firma:
Einlösungen:	Place:	Date:	Signature:	Company:
	Reinach	19.03.2007		Endress+Hauser Flowtec AG CH-4153 Reinach

Wir bestätigen, dass die Umstempelung gemäss obiger Liste im Einvernehmen mit dem SVTI durch einen unserer Sachverständigen erfolgte. We confirm that the heat no. transfer for the above mentioned material has been performed by our specialists, in conformance with SVTI.

T/R/006A(1)

Inspection Certificate (EN10204/3.1B)

Customer : ENDRESS + HAUSER FLOWTEC (I) PVT.LTD
AURANGABAD

Inspection No : 40993/8.8.06

Part :

Page : 1 of 2

Manufacturer : **Uni Derltend Limited**



S.V Road, Manpada, Thane 400 607, India
Phone : 2 589 0112, 2 589 0114, 2 589 0115, 2589 0088, 2589 0685
Fax : (91-22) 2589 1089
E-Mail : udl@bom5.vsnl.net.in

Article : **Investment Castings**

Order No : AOI/2046002099,20137135

Date : 8.5.06,14.7.06

INV.NO. & Dt 321/06-07 DT 8.8.06

Technical Specifications / Requirements : ASTM

Material : Cast Stainless Steel According to : A 351 Gr CF3M Edition : 2000

Delivery Condition : UnMachined

Melting Process : Induction Melting

Marking : Heat No., Brand of the manufacturer, Material

Brand of the Manufacturer : U

Inspector's stamp : UI

Extent of Delivery:

Item No.	No of Pieces	Article	Heat No	Test No
Works Code: 26-E-16	32	METER BODY PW F 15 W/O FL 330500-0000 INDEX-D (50104934)	D726	

Chemical Analysis :

Heat No.	C	Si	Mn	P	S	Cr	Ni	Mo	V	Nb
Specific d:										
Min:	--	--	--	--	--	17.0	9.0	2.0	--	--
Max:	0.03	1.5	1.5	0.040	0.040	20.0	13.0	3.0	--	--
D726	0.028	0.83	0.88	0.019	0.012	17.76	9.38	2.18	-	-

The requirements are fulfilled as per Annex :

Place : Thane

Date : 8.8.06

Annexes :


The Inspector



TEST RESULTS

EN 10204/3.1B

T/R/006A(2)

Uni Deritend Limited

S V Road, Manpada, Thane 400 607, India.

Phone : 2 589 0112, 2 589 0114, 2 589 0115, 2589 0088, 2589 0685

Fax : (91-22) 2589 1089

E-Mail : udl@bom5.vsnl.net.in

Works Code : 26E16

Article : METER BODY PW F 15 W/O FL 330500-0000 INDEX-D (50104934)

Inspection No. : 40993/8.8.06

Annex :

Mechanical Tests :

Part :

Page : 2 of 2

Test No / Heat No	Dim of Specimen		Specimen			Test Temperatur	Yield Point Proof Stress	Tensile Strength	Elongation	Reduction of Area	1 = (J) Energy of Impact 2 = (J/cm²) Impact Strength 3 = (%) Cryst Proportion 4 = (mm 10³) } Expansion 5 = (%) 6 = Hardness			
	Thick- ness Dia	Width	Location	Direction	Position									
	mm	mm				°C	Mpa	Rm Mpa	A %	Z %	Values			
											1	2	3	Σ 1-3
											<u>At room</u>		<u>Ave.</u>	
											<u>temp</u>			
D726	6.25	-	Integral			Ambi- ent Temp.	293.2	514.8	45.60	-	127,128,124	126.33		

Heat treatment : Solution annealing

Radiography : Satisfactory – within acceptance level

Liquid penetrant test : Satisfactory

Severity level S2/V3 according to DIN 1690 part 2 – confirmed

Castings are in pickled condition

Place : Thane

Date : 8.8.06

[Signature]
The Inspector



NEUMAYER



Firma
Dynaflex
Kägenstrasse 14

CH 4153 Reinach BLI

ABNAHMEPRÜFZEUGNIS DIN 50049 / EN 10204 3.1

Inspektioncertifikat / Certificat de réception
Herstellierzulassung TÜV nach AD 2000 und
PED-97/23/EG Anhang 1, Absatz 3 liegt vor.

Stempel des Herstellers
Mark of factory
Poinçon d'usine



Stempel der Werkprüfstelle
Mark of factory's inspection
Poinçon de réception d'usine



Pos.: 1 von 1

Besteller / manager / le commandant Dynaflex	Ihre Bestellung / Your order / Votre commande 0671365 v. 10 10 06	Tag / Date / Date 09.11.2006	Komm.-Nr. / works-No / Nbre ré. 5034234/10
Gegenstand / Article / Désignation du produit WN Rohl. 600lb 1/2" RTJ alls. ohne M'loch	Menge/Stück Quantity 100	Anforderungen / Requirements / Valeurs demandés AD2000-W2/W9/W10; ASTM A182; NACE MR 0175	
Erzeugnisform / Product / Produit Gesensschmiedestück	Werkstoff (Norm) / Matériel correspondant / Matériel correspondant 1.4404/ F316L/ F316	Erschmelzungsart Kind of melting Mode de fusion E	Teile-Nr. / Article No R04 00 22106

Prüfergebnisse

Maße und Lage der Probe
Dimensions and Position of test piece
Dimensions et Position de l'éprouvette
rd. 8 mm q/t

Probe Specimen Epreuve Nr./No	Härte Hardness Dureté HB 10/3000	Streckgrenze Yield point Limite d'élasticité Rp = 0,2%	N/mm² Rp = 1,0 %	Zugfestigkeit Tensile strength Résistance à la traction Rm	Dehnung Elongation Allongement (Lo-5 d) A5	Einschnürung Reduction of area Striction Z	Kerbschlagarbeit nach EN 10045 Imp. Strength Résistance KV J/ RT q/t		
Gutwert accepté conforme	235	190	225	490 690	35		60		
261918	163 164	251	293	548	52	69	265 /	278 /	241

Bemerkungen / Remarks / Remarques

Wärmebehandlung: lösungsgeglüht: 1050°C, Wasser, Heat treatment: 1050°C
quenching in water, 100% Werkstoffverwechslungsprüfung spectralanalytisch
durchgeführt: o B , 100% control of material identity produced by spectro-
scopic method: a r Prüfung auf Beständigkeit gegen Interkristalline Korro-
sion n EN ISO 3651-2 durchgeführt: Material ist IK-beständig, Interkristalline
corrosion has been carried out acc. EN ISO 3651-2: no cracks

Schmelze Heat Charge Nr./No	C Ti %	Si Nb %	Mn V %	P N %	S Cu %	Cr B %	Mo % *Cb	Ni %	Al %
192106	0,013	0,620	1,320	0,024	0,012	16,910	2,030	11,290	
	0,008			0,039	0,200		0,002		

Werkstoff und Ausführung der Produkte stimmen mit den vertraglich vereinbarten Angaben überein. Die Analysewerte stimmen mit
dem Ursprungszeugnis überein. Beschichtung und Maßprüfung ohne Beanstandung.
Material and products are corresponding to the indications in our contract. The values of the analyses correspond to the origin certificate of our material.
Le matériau et l'exécution des produits correspondent à la indications dans notre contrat les indications de l'analyse correspondent au certificat d'origine de
le matériau du client.

RICHARD NEUMAYER
Abnahmebeauftragter

Grenzer Leiter QM



Date / Datum : 17/01/2006

Certificato di collaudo secondo

EN10204:04/3.1

Certificato / Zeugnis : 41

Abnahmeprüfzeugnis

EN10204:04/3.1

Customer / Besteller : 0579 BOSSARD CH

Reference-Code PED-97/23/UE-ADW0/TRD/400-106/ISO3506-AD-W2

Anforderungen nach PED 97/23/UE-ADW0/TRD/400-106/ISO3506-AD-W2

With Tuv Rheinland e V Approval :01202926/Q-02-0028 15/05/2002

Mit Zustimmung des Tuv Rheinland e V :01202926/Q-02-0028 15/05/2002

Specification / Umfang der Lieferung

Stück Quantity	Abmessung Size of Product	DIN	ISO	UNI	Lotto N° Lotto N°	Werkstoff Material	Kennzeichnung Marking	N° Bestellung N° order	N° Rechnung N° invoice	Lieferzeit Deliv Time
1	54500	M5X12	912		53627-A0	A4	CR A4-70	5562841	B3-7	16/01/2006
2										

Chemical composition are taken from the specification of the Manufacturer

Chemische Zusammensetzung wurde von den Herstellernachweisen entnommen

	Chargen CASTING	C %	Si %	Mn %	P %	S %	Cr %	Mo %	Ni %	Cu %	Ti %	V %	Al %	N %	W %
1	5VE4	0,027	0,716	1,669	0,033	0,003	17,136	2,265	11,106	0,72	0,005	0	0	0,039	0
2															

Mechanical Properties / Mechanische Eigenschaften

Streckgrenze Yield stress Rp 0,2% N/mm2		Zugfestigkeit Tensile stress N N/mm2		Bruchdehnung (mm) Elongation value (mm) L1 L2 AL			Härtegrad Hardness HV HB HRB HRC				Bruchform Striction	T Festigkeits Res Tension	Vordichtbarkeit Compression Test
1	12.930,0	910,6	14.868,8	1.047,1			2,2						
2													

Visual Control / Besichtigung : O.K.

Dimensional control / Sichtkontrolle : O.K.

NOTE: AD 2000 W0 (W10)

Technician / Prüfer: Cattinori Marinella

Responsabile garanzia qualità / Quality Inspector Cattinori Monica
(Laboratorio Prove Meccaniche)

17/01/2006

Bossard

Bossard AG
Engineering
Postfach
CH-8301 Zug

Firma

3.1 002.142/06

Kurt Schneider AG
Tempelstrasse 1
3608 Thun / Allmendingen





SVTI - Zulassung : KIS.PQ.400101

Umstempelungsbescheinigung

von Werkstoffen mit Gütenachweis

Besteller: Endress + Hauser Flowtec AG
CH - 4153 Reinach

Nr: 07012201

Gegenstand		* P = Bleche T = Rohre		F = Schmiedestücke		Zeugnis		Neue Stempelung auf Lieferung			Kontroll - stempel
Benennung	Liefer - Abmessungen	Hersteller	Nr.	Typ	Werkstoffe	Schmelze - Nr.	Probe - Nr.				
PW 77/72	Elektrode	Acciaierie Valbruna	MEST 403105/ 2006	3.1B	1.4301	242904	611701950				
PW 77	Membrane eingeschr. in Elektrode	Acciaierie Valbruna	MEST 385396/ 2006	3.1B	1.4435	242343	607402840				

Anlagen : 2 Zeugnis (se) Ort : Thun / Allmendingen Datum : 22. Januar 2007 Firmenstempel / Unterschrift : **KURT SCHWEIDER AG**

Wir bescheinigen, dass die Umstempelung gemäss obiger Liste durch unseren Sachverständigen erfolgte.

Feinmechanik
Tempelstrasse 1
3608 THUN / ALLMENDINGEN
Tel 033 334 70 20 Fax 033 334 70 30

Acciaierie Valbruna S.p.A.



CERTIFICATO DI COLLAUDO ABNAHMEPRUEFZEUGNIS INSPECTION CERTIFICATE CERTIFICAT DE RECEPTION EN 10204, 3.1

36100 VICENZA (Italia) - Viale della scienza, 25 z.I.

Stab.: 39100 BOLZANO (Italia) - Via A. Volta, 4

Cliente / Besteller/Kunden/Klient
VALBRUNA AG
NEUBURGSTRASSE 54 POSTFACH 212
03282-BARGEN BEI AARBERG-CH

Produttore: ACCIAIERIE VALBRUNA S.P.A.
Hersteller/Hersteller/Hersteller

Avviso di Spedizione: D-VI06024424
Lieferungsanweisung/Shipping Adv.

Ordine nr.: 609003939
Bestell-/Your order/Commande

Certificato nr.: MEST403105/2006/
Prüfung/Test/Exam

Conferma ordine nr.: E106007782
Works/Our Order/Ref. nr.

Marchio di Fabbrica:
Zeichendes Lieferwerkes
Trade mark
Sigle de l'usine - producer



Punzone del Collaudatore:
Stempel des Werkssachverständigen
Inspector's stamp/Punpon de l'essayer



Oggetto Provo: - Abgeschreckt Geschaeft
Prüfgegenstand/Item inspected/Finissage

Tipo di Elaborazione: E+AOD
Erziehungsart/Finishing process/Mode of elaboration

Specifiche:
Anforderungen / Requirements / Exigences

VAL AD-W2 2005 1.4301/1.4307 A
AD 2000-M W 2 2003. 1.4307 A (1)
ASME SA479 2004 S30400 A (2)
ASTM A276 2006 S30403 A
DIN 17440 96 1.4301
EN 10272 2000 1.4301
NACE MR0175 2003 S30403 A (5)
(1) ACCORDING TO DIN 17440,96 - EN 10272.2000
(2) SEC.II PT.A 2004 EDITION ADD.2005
(4) * ISO 15158-3

AD 2000-M W 10 2003.
AISI 304
ASME SA479 2004 S30403 A (3)
ASTM A479 2006 S30400 A
EN 10088-3 2005 1.4301 A
EN 10272 2000 1.4307

AD 2000-M W 2 2003. 1.4301 A (1)
AISI 304L
ASTM A276 2006 S30400 A
ASTM A479 2006 S30403
EN 10088-3 2005 1.4307 A
NACE MR0175 2003 S30400 A (4)

(1) ACCORDING TO EN 10272.2000
(3) SEC.II PT.A 2004 EDITION ADD 2005
(5) * ISO 15158-3

Qualità: 1.4301/1.4307
Werkstoff/Grade/Qualité

Marca: MVAISL MAXIVAL
Markenbezeichnung/Brand/Usine

Punzonatura: 1.4301/1.4307
Kennzeichnung/Marking/Stampage

Pos. nr. Pos. nr. Nb. de poste	Oggetto Gegenstand Product description Descript. du produit	Dimensioni - mm Abmessungen Dimension Dimension	Tolleranza Toleranz Allowance Tolérance	Lunghezza - mm Länge Length Longueur	Colata Schmelze Heat Coulée	Pezzi Stückzahl Pieces Pièces	Peso - KG Gewicht Weight Poids	Lotto nr. Losn. Lot nr. Lot nr.
0020	Rund	45,000	K12-MIN	6000 / 8040	242904		2124,0	611701950

Sono state soddisfatte tutte le condizioni richieste
Die gestellten Anforderungen sind in Anlage erfüllt
The material has been furnished in accordance with the requirements
Le matériel a été fourni conforme aux exigences

Controllo antimoscolanza: OK
Verwachsungsprüfung: spektralanalytisch durchgeführt
Antifusing testing performed: OK
Contôle anti-mélange effectué: OK

Controllo visivo e dimensionale: soddisfa le esigenze:
Besichtigung und Ausmessung: ohne Beanstandung
Visual inspection and dimension check: satisfactory
Contrôle visuel et dimension: satisfaisant

Caratteristiche meccaniche (M.P.S.)															Mechanical Characteristics (M.P.S.)									
TEST	Prova/Prüfung Essai/Examen Type of test Type of exam Type of exam Type of exam		°C	Posti Stages Positions Positions	Snervamento Zugversuch Tensile test Tensile test Rp 0,2% N/mm2		Snervamento Zugversuch Tensile test Tensile test Rp 1% N/mm2		Resistenza Zugfestigkeit Tensile strength Tensile strength Rm N/mm2		Allungamento Bruchdehnung Elongation Elongation A5 %		Allungamento Bruchdehnung Elongation Elongation E4d %		Strizione Bruchdehnung Reduction of area Reduction of area Z %		RA		Resilienza Kerndruckversuch Impact value Impact value KV J			Durezza Härte Hardness Hardness HB		
	Valori richiesti 1 Anforderungen in Tabelle 1 Values required 1				min	max	205	230	515 680	45	40	-	50	100	-			215						
A	10	20	L	323	359	625	57	59	67	67	223	225	219	182										
B	10	20	L	325	360	628	58	60	68	68	225	228	229	184										
C	10	20	L	320	355	620	56	58	66	66	221	220	215	180										
D	10	20	L	328	359	631	57	59	67	67	223	225	219	182										

Korngrösse nach ASTM E112

6

1) L=longitudinale/Längs, O=transversale/Quers., T=Temperatura/temperatur

Analisi chimica

Chemische Zusammensetzung/Chemical Analysis/Analyse chimique

Colata/Heat Schmelze/Heat	min max	0,030	1,00	2,00	18,00 18,50	0,00 10,00	0,045	0,030	0,100	-	-	-	-	-	-
	C %	SI %	Mn %	Cr %	NI %	P %	S %	N %							
242904	0,017	0,54	1,75	18,20	8,25	0,028	0,030	0,089							

I Korrosion nach EN ISO 3651-2A Sensibilisierung: T1: OK

Corrosion test per EN ISO 3651-2A sensitized T1: OK

Temperaturgerecht warmumgeformt

Im Einvernehmen mit TUV BAYERN (Juli 1972).

Gegenzeichnungsvorschrift durch TUV BAYERN (21.05.1979).

Melted and manufactured in Italy No welding or weld repair Material free from Mercury or radio-activity contamination
The Quality Management System is Certified acc. Pressure Equipment Directive [97/23/EC] Annex 1, 4.3 by TUV and LLOYD'S

Vicenza, 04/10/06 Usc./Exit	Il collaudatore di stabilimento / der Werkssachverständige / Works Inspector / L'agent d'usine M. Rizzotto	Pagina - 1 di 1
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Acciaierie Valbruna S.p.A.



CERTIFICATO DI COLLAUDO ABNAHMEPRUEFZEUGNIS INSPECTION CERTIFICATE CERTIFICAT DE RECEPTION EN 10204 , 3.1

36100 VICENZA (Italia) - Viale della scienza, 25 z.l.

Stab.: 39100 BOLZANO (Italia) - Via A. Volta, 4

Cliente / Besizer/Kunde: VALBRUNA AG

NEUENBURGSTRASSE 54 POSTFACH 212

03282-BARGEN BEI AARBERG-CH

Produttore: ACCIAIERIE VALBRUNA S.P.A.

Hersteller/Item/Kunde produce

Avviso di Spedizione: D-VI06020336

Lieferanzzeit/Freight time/D.L.

Certificato nr: MEST385396/2006/

Prüfung/Try/Essai

Conferma ordine nr: EI06002719

Werkst./Our Order/Ref. nr.

Marchio di Fabbrica:

Zeichen des Werksachverständigen

Trade mark

Signe de l'usine productrice



Punzone del Collaudatore:

Stempel des Werksachverständigen

Inspector's stamp/Pointon de l'essayeur



Oggetto Prove: - Abgeschreckt Geschaelt

Prüfgegenstand/Tem Inspected/Finissage

Tipo di Elaborazione: E+AOD

Erweiterungsart/Refining process/Mode d'elaboration

Specifiche:

Anforderungen / Requirements / Exigences

VAL AD-W2 2005 1.4435 A

AD 2000-M. W 2 2003 1.4435 A (1)

EN 10088-3 2005 1.4435 A

FERRITE <0,5 2003

(1) ACCORDING TO DIN 17440.98 - EN 10272.2000

(2) * ISO 15156-3

BN 2 97 1.4435 A

ASME SA478 2004 S31600/03 A (1)

EN 10272 2000 1.4435

AD 2000-M. W 10 2003

DIN 17440 98 1.4435

NACE MR0175* 2003 S31600/03 (2)

(1) SEC II PT A 2004 EDITION ADD 2005

Qualità: 1.4435

Werkstoff/Grade/Qualite

Marca: MVAPMLD2 MAXIVAL

Markenbezeichnung/Brand/Marque

Punzonatura: 1.4435

Kenntzeichnung/Marking/Marquage

Pos. nr. Pos. nr. Item nr. Nr. de poste	Oggetto Geometrie Product description Description du produit	Dimensioni - mm Abmessungen Dimension	Tolleranza Toleranz Allowance Tolerance	Lunghezza - mm Länge Length Longueur	Colata Schmelze Heat Coulée	Pezzi Stückzahl Pieces Places	Peso - KG Gewicht Weight Poids	Lotto nr. Losv. Lot nr. Lot nr.
0010	Rund	26,000	H12-MIN	5410 / 5410	242343		1428,0	607402840

Sono state soddisfatte tutte le condizioni richieste

Die gestellten Anforderungen sind lt. Anlage erfüllt

The material has been furnished in accordance with the requirements

Le matériel a été fourni conforme aux exigences

Controllo antimescolanza: OK

Vermischungsprüfung: spektralanalytisch durchgeführt

Antimixing testing performed: OK

Contrôle antimeslange fait: f.a.s.

Controllo visivo e dimensionale: soddisfa le esigenze:

Beachtungs- und Ausmessung: ohne Beanstandung

Visual inspection and dimensional check: satisfactory

Contrôle visuel et dimensionnel: satisfaisant

TEST	Prove/Prüfung Randversuch Longitud. Exam. Brinell Hard. 150kg Mohr Diam. Thickness Long. Diam. Hole mm	°C	Snervamento Deformazione Yield Stress Yield Stress Rp 0,2% Rp 0,2% N/mm2	Snervamento Deformazione Yield Stress Yield Stress Rp 1% Rp 1% N/mm2	Resistenza Tensile strength Tensile strength Resistance à traction Rm N/mm2	Allungamento Streckdehnung Elongation Elongation A5 E 4d %	Strizione Zugdehnung Reduction of area Reduction of area Z RA %	Resilienza Kerbschlagarbeit Impact Value Resilience KV J	Durezza Härte Hardness Dureté HB
	Valori richiesti 1 Anforderungen/Prescribed values Values réqueries	min max	205	235	515 690	40 30	- 40	100	- 215
A	10	20	L	253	286	578	63 65	75 75	240 243 240 182
B	10	20	L	250	284	576	63 65	75 75	247 242 240 0
C	10	20	L	250	283	575	62 64	74 74	246 244 241 0

Korngröße nach ASTM E112

: 5 - TEST C

DELTA FERRIT

: 0,2 - TEST C

(L)=longitudinale/long., O=transversale/quer, T=Tangenziale/tangentiale

Analisi chimica

Chemische Zusammensetzung/Chemical Analysis/Analyse chimique

Colata Heat Schmelze/Coulée	min - max 0,030	1,00	2,00	17,00 18,00	2,50 3,00	12,50 14,00	0,050	0,045	0,030	0,100	-	-	-	-	-
	C %	Si %	Mn %	Cr %	Mo %	Ni %	Ti %	P %	S %	N %					
242343	0,018	0,37	1,24	17,57	2,66	12,67	0,045	0,031	0,022	0,082					

I. Korrosion nach EN ISO 3651-2A Sensibilisierung: T1: OK

Corrosion test per EN ISO 3651-2A sensitized T1: OK

Abgeschreckt 1070°C/H2O.

Im Einvernehmen mit TUV BAYERN (Juli 1972).

Gegenzeichnungsverzicht durch TUV BAYERN (21.05.1979).

Melted and manufactured in Italy No welding or weld repair Material free from Mercury or radio-activity contamination

The Quality Management System is Certified acc. Pressure Equipment Directive (97/23/EC) Annex 1, s. 4.3 by TÜV and LLOYD'S

Vicenza, 27/07/06

Mod. VC0012

Il collaudatore di stabilimento / der Werksachverständiger / Works Inspector / L'agent d'usine

M. Rizzotto

Pagina - 1 di 1

Abnahmeprüfzeugnis nach EN 10204 - 3.1 **Inspection certificate acc. to EN 10204 - 3.1**

Zeugnis-Nr./Certificate No. CA - 49333950
Seite/Page 1 von/of 1

Es wird bescheinigt, dass die gelieferten Erzeugnisse den Vereinbarungen bei der Bestellung entsprechen. Darüber hinaus wird bescheinigt, dass bei der Herstellung der nachstehend aufgeführten Erzeugnisse die vorgeschriebenen Prüfungen und/oder die zusätzlich aufgeführten Prüfungen nach den bestehenden Prüfvorgaben durchgeführt und die erforderlichen Freigaben erteilt wurden. Die unten aufgeführten Prüfungen wurden unter Aufsicht einer dazu autorisierten, unabhängigen Stelle durchgeführt.

It is certified that the products supplied are in compliance with the requirements of the order. Furthermore, it is confirmed that during the manufacturing of the subsequently listed products the specified inspections and/or the additionally ordered tests have been performed according to the valid procedures and the necessary releases have been given. The subsequently listed inspections have been performed by especially authorized personal.

Kunde/Customer : -
Kunden Bestell-Nr./Customer Order No. : -
E+H-Auftrags-Nr./E+H Order No. : 46550000

Pos./Item	Menge/Qty.	Produktbezeichnung/Description
250	1	72F15-SM0AA4PAB4AA PROWIRL 72 F 1/2" S/N.: 93038D16000 Tag-Nr.: FQIT-100

Drucktest Messsystem/Pressure Test Measuring System:

Druck/Pressure: 100 bar, Dauer/Duration: 3' 00", Medium/Fluid: Wasser/Water.

Alle Tests wurden mit Erfolg bestanden./All tests were passed successfully.

Datum/Date 05-11-2007

Endress+Hauser Flowtec, Division USA
Greenwood, IN 46143 USA

Jeff Griffin

Abnahmebeauftragter
Inspector

Flow Calibration with Adjustment

30100955-1682032

46550000

Purchase order number

CA-49333950-250 / Endress+Hauser Flowtec

Order N°/Manufacturer

72F15-SMOAA4PAB4AA

Order code

PROWIRL 72 F 1/2"

Transmitter/Sensor

93038D16000

Serial N°

FQIT-100

Tag N°

FCP-20 SMALL

Calibration rig

21.64712 GPM ($\pm 100\%$)

Calibrated full scale

Calibration Interface

Calibrated output

423.84 Imp./dm³

Calibration factor

72.6 °F

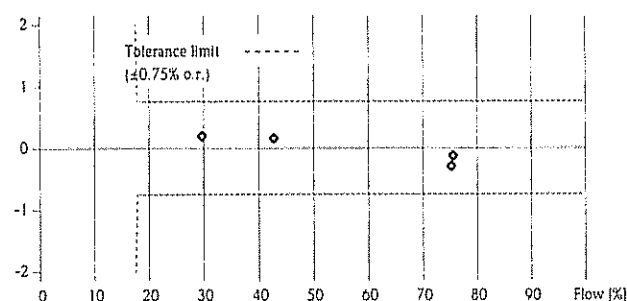
Water temperature

Flow [%]	Flow [GPM]	Duration [sec]	V target [US GAL]	V meas [US GAL]	Δ o.r.* [%]	Outp.** [mA]
29.8	6.46	30.6	3.2974	3.3037	0.19	8.78
42.9	9.28	30.6	4.7393	4.7467	0.16	10.87
75.5	16.3	30.6	8.3283	8.3031	-0.30	16.04
75.8	16.4	30.6	8.3761	8.3653	-0.13	16.11
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

*o.r.: of rate

**Calculated value (4 - 20 mA)

Measured error % o.r.



For detailed data concerning output specifications of the unit under test, see technical informations (TI), chapter Performance characteristics
The calibration is traceable to the NIST through standards certified at preset intervals

John Monaghan

05-16-2007

Date of calibration

Endress+Hauser Flowtec, Division USA
2330 Endress Place
Greenwood, IN 46143

John Monaghan

Operator

Certified acc. to
MIL-STD-45662A
ISO 9001, Reg.-N° 030502 2

Parameter Setting

1682032

46550000

Purchase order number

CA-49333950-250 / Endress+Hauser Flowtec

Order N°/Manufacturer

72F15-SM0AA4PAB4AA

Order code

93038D16000

Serial N°

PROWIRL 72 F

Transmitter/Sensor

1/2"

Nominal diameter

FOIT-100

Tag N°

Device Software

Application

Meas Unit Type

Operation Density

Reference Density

Meter Body MB

V1.03.00

liquid

Volume Flow

1 lb/ft³

1 lb/ft³

312

Current Output 1

Value for 20mA

Current Span

22 USgal/min

4-20mA HART US

Impulse Output 1

Pulse Value

Output Signal

1.32086 gal/P

PASSIVE/POSITIVE

The above parameters are set according to your order.
Please refer to the Operating Manual for any parameters not mentioned

05-16-2007

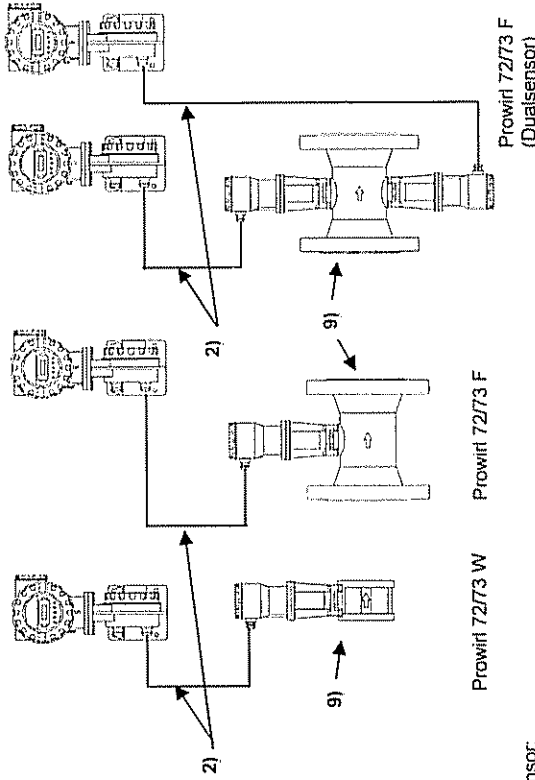
Date

Endress+Hauser Flowtec, Division USA
2330 Endress Place
Greenwood, IN 46143

Hazardous Locations

Class I Division 1 Groups ABCD or Class I Zone 1 Group IIC
Class II Division 1 Groups EFG
Class III

Remote version



Sensor:

PROWIRL 7...1...N... PROWIRL 7...2...N... PROWIRL 7...3...N... PROWIRL 7...4...N... PROWIRL 7...5...N... PROWIRL 7...6...N... PROWIRL 7...7...N... PROWIRL 7...8...N... PROWIRL 7...9...N... PROWIRL 7...0...P... PROWIRL 7...1...P... PROWIRL 7...2...P... PROWIRL 7...3...P... PROWIRL 7...4...P... PROWIRL 7...5...P... PROWIRL 7...6...P... PROWIRL 7...7...P... PROWIRL 7...8...P... PROWIRL 7...9...P... PROWIRL 7...0...G... PROWIRL 7...1...G... PROWIRL 7...2...G... PROWIRL 7...3...G... PROWIRL 7...4...G... PROWIRL 7...5...G... PROWIRL 7...6...G... PROWIRL 7...7...G... PROWIRL 7...8...G... PROWIRL 7...9...G...

Max. medium temperature						
T6 2)	T5 2)	T4	T3	T2	T1	
Ta = 104°F	176°F	203°F	266°F	374°F	554°F	824°F
Ta = 140°F	---	203°F	266°F	374°F	554°F	824°F
Ta = 185°F	---	---	266°F	374°F	554°F	824°F

PROWIRL 7...0...P... PROWIRL 7...1...P... PROWIRL 7...2...P... PROWIRL 7...3...P... PROWIRL 7...4...P... PROWIRL 7...5...P... PROWIRL 7...6...P... PROWIRL 7...7...P... PROWIRL 7...8...P... PROWIRL 7...9...P... PROWIRL 7...0...G... PROWIRL 7...1...G... PROWIRL 7...2...G... PROWIRL 7...3...G... PROWIRL 7...4...G... PROWIRL 7...5...G... PROWIRL 7...6...G... PROWIRL 7...7...G... PROWIRL 7...8...G... PROWIRL 7...9...G...

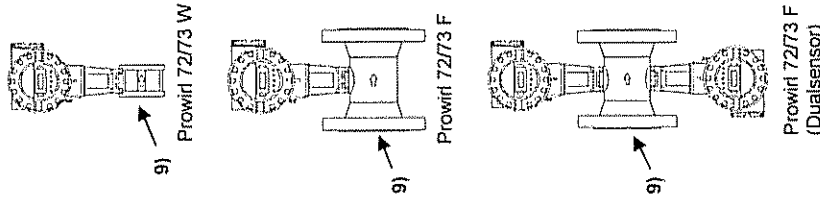
Max. medium temperature						
T6 2)	T5 2)	T4	T3	T2	T1	
Ta = 104°F	176°F	203°F	266°F	374°F	554°F	824°F
Ta = 140°F	---	203°F	266°F	374°F	554°F	824°F
Ta = 185°F	---	---	266°F	374°F	554°F	824°F

Transmitter:

PROWIRL 7...0...P... PROWIRL 7...1...P... PROWIRL 7...2...P... PROWIRL 7...3...P... PROWIRL 7...4...P... PROWIRL 7...5...P... PROWIRL 7...6...P... PROWIRL 7...7...P... PROWIRL 7...8...P... PROWIRL 7...9...P... PROWIRL 7...0...G... PROWIRL 7...1...G... PROWIRL 7...2...G... PROWIRL 7...3...G... PROWIRL 7...4...G... PROWIRL 7...5...G... PROWIRL 7...6...G... PROWIRL 7...7...G... PROWIRL 7...8...G... PROWIRL 7...9...G...

Max. medium temperature			
T6 2)	T5 2)	T4 - T1	
104°F	140°F	140°F	

Compact version



PROWIRL 7...1...N... PROWIRL 7...2...N... PROWIRL 7...3...N... PROWIRL 7...4...N... PROWIRL 7...5...N... PROWIRL 7...6...N... PROWIRL 7...7...N... PROWIRL 7...8...N... PROWIRL 7...9...N... PROWIRL 7...0...P... PROWIRL 7...1...P... PROWIRL 7...2...P... PROWIRL 7...3...P... PROWIRL 7...4...P... PROWIRL 7...5...P... PROWIRL 7...6...P... PROWIRL 7...7...P... PROWIRL 7...8...P... PROWIRL 7...9...P... PROWIRL 7...0...G... PROWIRL 7...1...G... PROWIRL 7...2...G... PROWIRL 7...3...G... PROWIRL 7...4...G... PROWIRL 7...5...G... PROWIRL 7...6...G... PROWIRL 7...7...G... PROWIRL 7...8...G... PROWIRL 7...9...G...

Max. medium temperature						
T6 2)	T5 2)	T4	T3	T2	T1	
Ta = 104°F	176°F	203°F	266°F	374°F	554°F	824°F
Ta = 140°F	---	203°F	266°F	374°F	554°F	824°F

PROWIRL 7...0...P... PROWIRL 7...1...P... PROWIRL 7...2...P... PROWIRL 7...3...P... PROWIRL 7...4...P... PROWIRL 7...5...P... PROWIRL 7...6...P... PROWIRL 7...7...P... PROWIRL 7...8...P... PROWIRL 7...9...P... PROWIRL 7...0...G... PROWIRL 7...1...G... PROWIRL 7...2...G... PROWIRL 7...3...G... PROWIRL 7...4...G... PROWIRL 7...5...G... PROWIRL 7...6...G... PROWIRL 7...7...G... PROWIRL 7...8...G... PROWIRL 7...9...G...

Max. medium temperature						
T6 2)	T5 2)	T4	T3	T2	T1	
Ta = 104°F	176°F	203°F	266°F	374°F	554°F	824°F
Ta = 140°F	---	203°F	266°F	374°F	554°F	824°F

Notes:

1) Assignment of Control Drawings:

Drawing-No.	Model Codes:
FES0077 A	Prowirl 7...0...P... PROWIRL 7...1...P... PROWIRL 7...2...P... PROWIRL 7...3...P... PROWIRL 7...4...P... PROWIRL 7...5...P... PROWIRL 7...6...P... PROWIRL 7...7...P... PROWIRL 7...8...P... PROWIRL 7...9...P... PROWIRL 7...0...G... PROWIRL 7...1...G... PROWIRL 7...2...G... PROWIRL 7...3...G... PROWIRL 7...4...G... PROWIRL 7...5...G... PROWIRL 7...6...G... PROWIRL 7...7...G... PROWIRL 7...8...G... PROWIRL 7...9...G...
FES0077-0001 A	Prowirl 7...0...P... PROWIRL 7...1...P... PROWIRL 7...2...P... PROWIRL 7...3...P... PROWIRL 7...4...P... PROWIRL 7...5...P... PROWIRL 7...6...P... PROWIRL 7...7...P... PROWIRL 7...8...P... PROWIRL 7...9...P... PROWIRL 7...0...G... PROWIRL 7...1...G... PROWIRL 7...2...G... PROWIRL 7...3...G... PROWIRL 7...4...G... PROWIRL 7...5...G... PROWIRL 7...6...G... PROWIRL 7...7...G... PROWIRL 7...8...G... PROWIRL 7...9...G...

2) Max. cable length for intrinsically safe installation 100m for using cable parameters $L_{\text{cable}} = 1\text{mH/km}$ / 0.3mH/ft and $C_{\text{cable}} = 1\text{pF/km}$ / 300pF/ft

3) Temperature class T6 and T5 is not allowed for versions of Profibus PA and Fieldbus Foundation

(not for PROWIRL 7...0...P... PROWIRL 7...1...P... PROWIRL 7...2...P... PROWIRL 7...3...P... PROWIRL 7...4...P... PROWIRL 7...5...P... PROWIRL 7...6...P... PROWIRL 7...7...P... PROWIRL 7...8...P... PROWIRL 7...9...P... PROWIRL 7...0...G... PROWIRL 7...1...G... PROWIRL 7...2...G... PROWIRL 7...3...G... PROWIRL 7...4...G... PROWIRL 7...5...G... PROWIRL 7...6...G... PROWIRL 7...7...G... PROWIRL 7...8...G... PROWIRL 7...9...G...)

4) Caution: Use supply wires suitable for 50°F above maximum ambient temperature

5) Caution: Surface temperature of transmitter enclosure can exceed 158°F depending on ambient temperature or medium temperature

Dust tight seals must be used at conduit entries for Class II and III installation

The Prowirl 72/73 is Factory Sealed. This means that a conduit seal is not required within 18 inches (450mm) of the enclosure.

6) The Prowirl 72/73 is a Dual Seal Device in accordance to ANSI/ISA-12.27.01-2003

7) The Prowirl 72/73 is intended for installation to Service Interface

8) FXA 193 when using the PROLINE EX-ZWEIFLEITER-KABEL (blue cable)

9) Sensor of remote version and interior of measuring tube of remote and compact versions are permissible for use in Zone 0

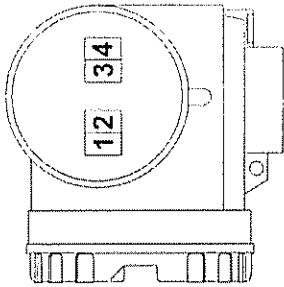
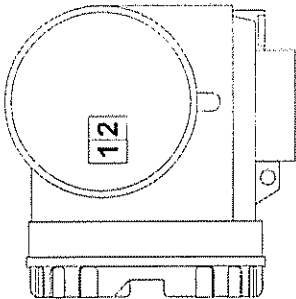
Anderungen:		A	10.12.03 / Bn	F	G	H	J	K	Alle gesetzlichen Urheberrechte vorbehalten. Diese Zeichnung darf ohne unsere Genehmigung weder vervielfältigt werden noch dritten Personen und Konkurrenzfirmen zugänglich gemacht werden.		Erstellt durch: Ersatz für: Ersteller: FES/Bn Datei: M:\ZEICHNUNG\...031210c.doc ID 1112		
FM CONTROL DRAWING										Massstab	Gezeichnet	08.09.03	Bn
PROWIRL 72, PROWIRL 73 (XP-version)											Geprüft		
Compact Version, Remote version											Ex-geprüft	10.12.03	Bn
											Gesehen		
										FES0077 A			



Flowtec AG, Kaagenstrasse 7, CH-4153 Reinach BL1, Postfach

Hazardous Locations

- Class I Division 1 Groups ABCD or Class I Zone 1 Group IIC
- Class II Division 1 Groups EFG
- Class III



Note:

- 6) Installation of transmitter circuit wiring according to National Electrical Code using threaded conduit.
- 7) **WARNING** Terminal compartment: **KEEP COVER TIGHT WHEN CIRCUITS ARE ALIVE OR THE AREA IS KNOWN TO BE HAZARDOUS**
- 8) Control room equipment may not use or generate over 250Vrms.
- 9) **WARNING:** SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.

Prowirl 7* **.....P**A**

Division 1 and Division 2 installation

- 1) Terminal 1 and 2
Supply voltage: $U \leq 36 \text{ Vdc}$
 $U_{\text{max}} = 250 \text{ Vdc}$
Signal current: $4 \dots 20 \text{ mA (max. 25 mA)}$

Prowirl 7* **.....P**H and Prowirl 7* **.....P****K**

Division 1 and Division 2 installation

- 2) Terminal 1 and 2
Supply voltage: $U \leq 36 \text{ Vdc}$
 $U_{\text{max}} = 250 \text{ Vdc}$

Prowirl 7* **.....P**W**

Division 1 and Division 2 installation

- 3) Terminal 1 and 2
Supply voltage: $U \leq 36 \text{ Vdc}$
 $U_{\text{max}} = 250 \text{ Vdc}$
Signal current: $4 \dots 20 \text{ mA (max. 25 mA)}$
- 4) Terminal 3 and 4
Pulse Output: $U \leq 30 \text{ V}$
 $U_{\text{max}} = 250 \text{ Vdc}$
Signal current: $\leq 30 \text{ mA}$

Class II, III installation

- 5) Transmitter circuit wiring in conduit in accordance with the NEC ANSI/NFPA 70

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	B		G					
	C		H					
	D		J					
	E		K					
FM CONTROL DRAWING					Gezeichnet	08.09.03	Bn	
PROWIRL 72, PROWIRL 73 (XP-version)					Gepüft			
					Ex-geprüft	10.12.03	Bn	
					Gesehen			



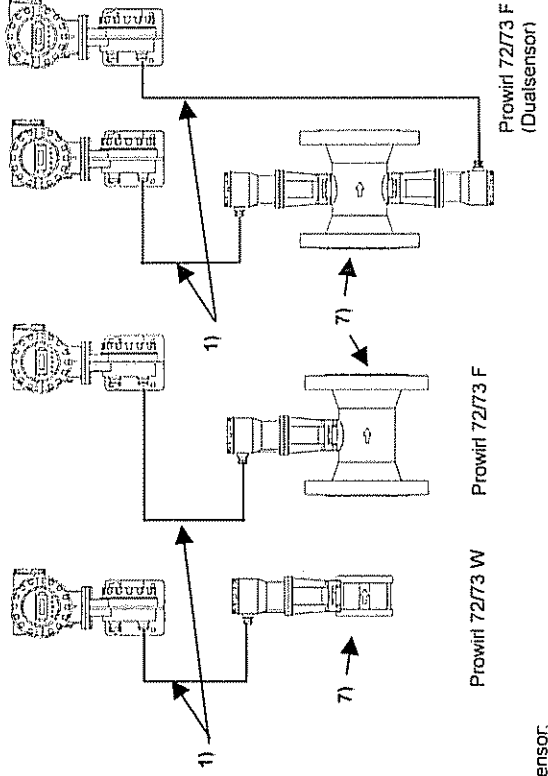
Flowtec AG, Kaegensstrasse 7, CH-4153 Rematch BL1, Postfach

FES0077-0001 A

Hazardous Locations

Class I Division 1 Groups ABCD or Class I Zone 1 Group IIC
Class II Division 1 Groups EFG
Class III

Remote version



Sensor

PROWIRL 7... ..1...N... .. PROWIRL 7... ..2...N... .. PROWIRL 7... ..3...N... ..
PROWIRL 7... ..4...N... .. PROWIRL 7... ..6...N... .. PROWIRL 7... ..7...N... ..
PROWIRL 7... ..C...N... .. PROWIRL 7... ..F...N... .. PROWIRL 7... ..H...N... ..

Ta = 40°C	Max. medium temperature					
	T6.2)	T5.2)	T4	T3	T2	T1
Ta = 40°C	80°C	95°C	130°C	190°C	290°C	440°C
Ta = 60°C	---	95°C	130°C	190°C	290°C	440°C
Ta = 85°C	---	---	130°C	190°C	290°C	440°C

PROWIRL 7... ..0...N... .. PROWIRL 7... ..5...N... ..
PROWIRL 7... ..B...N... .. PROWIRL 7... ..G...N... ..

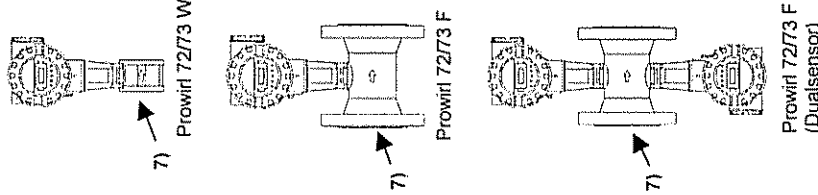
Ta = 40°C	Max. medium temperature					
	T6.2)	T5.2)	T4	T3	T2	T1
Ta = 40°C	80°C	95°C	130°C	190°C	290°C	280°C
Ta = 60°C	---	95°C	130°C	190°C	290°C	280°C
Ta = 85°C	---	---	130°C	190°C	290°C	280°C

Transmitter

PROWIRL 7... ..0...N... .. PROWIRL 7... ..5...N... ..

Ta =	T6.2)	T5.2)	T4 - T1
	40°C	60°C	60°C

Compact version



PROWIRL 7... ..1...N... .. PROWIRL 7... ..2...N... .. PROWIRL 7... ..3...N... ..
PROWIRL 7... ..4...N... .. PROWIRL 7... ..6...N... .. PROWIRL 7... ..7...N... ..
PROWIRL 7... ..C...N... .. PROWIRL 7... ..F...N... .. PROWIRL 7... ..H...N... ..

Ta = 40°C	Max. medium temperature					
	T6.2)	T5.2)	T4	T3	T2	T1
Ta = 40°C	80°C	95°C	130°C	190°C	290°C	440°C
Ta = 60°C	---	95°C	130°C	190°C	290°C	440°C

PROWIRL 7... ..0...N... .. PROWIRL 7... ..5...N... .. PROWIRL 7... ..B...N... ..
PROWIRL 7... ..G...N... ..

	Max. medium temperature				
	T6.2)	T5.2)	T4	T3	T2 - T1
Ta = 40°C	80°C	95°C	130°C	190°C	280°C
Ta = 60°C		95°C	130°C	190°C	280°C

Notes:

- Applicable Control Drawings
Drawing-No. Model Codes:
FES0076 A Proiwirl 7... ..P... ..
FES0076-0001 A Proiwirl 7... ..P... ..A, Proiwirl 7... ..P... ..W,
Proiwirl 7... ..P... ..H, Proiwirl 7... ..P... ..K
- Max. cable length for intrinsically safe installation of remote sensor is 100m for using cable parameters $L_{\text{cable}} = 1\text{mH/km}$ and $C_{\text{cable}} = 1\mu\text{F/km}$
- Temperature class T6 and T5 is not allowed for versions of Profibus PA and Fieldbus Foundation
(not for PROWIRL 7... ..P... ..H and PROWIRL 7... ..P... ..K)
- Caution: Use supply wires suitable for 10°C above maximum ambient temperature
- Caution: Surface temperature of transmitter enclosure can exceed 70°C depending on ambient temperature or medium temperature
- Dust tight seals must be used at conduit entries for Class II and III installation
- The Proiwirl 72/73 is Factory Sealed. This means that a conduit seal is not required within 18 inches (450mm) of the enclosure.
- Proiwirl 72 and Proiwirl 73 transmitter is intended for installation to Service Interface FXA 193 when using the PROLINE EX-ZWEIFLEITER-KABEL (blue cable)
- Sensor of remote version and inferior of measuring tube of remote and compact version are permissible for use in Zone 0

Änderungen:

A	B	C	D	E
Änderungen:				

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Ersetzt durch:

Erstellt für:

Ersteller: FESBn

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CSA CONTROL DRAWING

PROWIRL 72, PROWIRL 73 (XP-version)

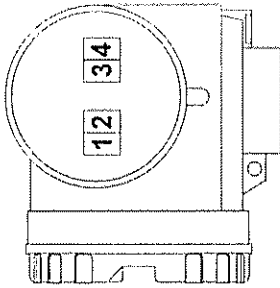
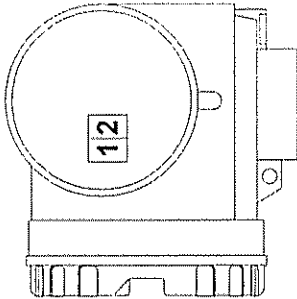
Compact Version, Remote version



Flowtec AG, Kaegonstrasse 7, CH-4153 Remach BL1, Postfach

FES0076 A

Hazardous Locations
Class I Division 1 Groups ABCD or Class I Zone 1 Group IIC
Class II Division 1 Groups EFG
Class III



Notes:

- 6) Installation of transmitter circuit wiring according to Canadian Electrical Code using threaded conduit.
- 7) **WARNING** Terminal compartment:
KEEP COVER TIGHT WHEN CIRCUITS ARE ALIVE
OR THE AREA IS KNOWN TO BE HAZARDOUS
- 8) Control room equipment may not use or generate over 250Vrms.
- 9) **WARNING:** SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.

Prowirl 7* ** *****P****A

Division 1 and Division 2 installation

- 1) Terminal 1 and 2
Supply voltage: $U \leq 36 \text{ Vdc}$
 $U_{\text{max}} = 250 \text{ Vdc}$
Signal current: $4 \dots 20 \text{ mA (max. 25 mA)}$

Prowirl 7* ** *****P****H and Prowirl 7* ** *****P****K

Division 1 and Division 2 installation

- 2) Terminal 1 and 2
Supply voltage: $U \leq 36 \text{ Vdc}$
 $U_{\text{max}} = 250 \text{ Vdc}$

Prowirl 7* ** *****P****W

Division 1 and Division 2 installation

- 3) Terminal 1 and 2
Supply voltage: $U \leq 36 \text{ Vdc}$
 $U_{\text{max}} = 250 \text{ Vdc}$
Signal current: $4 \dots 20 \text{ mA (max. 25 mA)}$
- 4) Terminal 3 and 4
Pulse Output: $U \leq 30 \text{ V}$
 $U_{\text{max}} = 250 \text{ Vdc}$
Signal current: $\leq 30 \text{ mA}$

Class II, III installation

- 5) Transmitter circuit wiring in conduit in accordance with the Canadian Electrical Code.

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		C		H			Ersteller: FES/Bn
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		E		K			Gezeichnet 18.6.03 Bn
CSA CONTROL DRAWING		Massstab				Geprüft	
PROWIRL 72, PROWIRL 73 (XP-version)						Ex-geprüft 10.12.03 Bn	
						Gesehen	
						FES0076-0001 A	



Flowtec AG, Kauggenstrasse 7, CH-4153 Reinach BL 1, Postfach