QUALITY CONTROL TURNOVER PACKAGE
REVISION 1

For

Husky Energy Inc.

Client PO No.: 8400432736
Project No: P1378
CSN 11437 – CSN 11441

Large Water Transfer Skids

Prepared by:

Crimtech Services Ltd.
22 McKenzie Drive
Red Deer County, AB T4S 2H4

Phone: 403-342-7579

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www.crimtech.com

CRIMTECH
Services Ltd

Table of Contents

Husky Energy

SEIM Data Collection - Packaged Equipment List

To be completed by Vendor

Husky P. O. #	8400432736	Vendor Job / Package No.	P1378 / CSN 11437	Project Description	Custom Large Water Transfer System

Compressor (all) / Pump (>10 HP)

Tag #	Description	Serial #
P-100	Seepex Pump Model BN-5-12V	830804.2

Driver (> 10 HP)

Tag #	Description	Serial #	Drives Tag #

Safety Valves

Tag #	Description	Serial #

Storage Tanks

Tag #	Description	Serial #

Building

Tag #	Description	Serial #
B-300	Self framing building, shed style	N/A

Pressure Equipment (Vessels, Exchangers , Fired Equipment)

Tag #	Description	Service		Serial #	Provincial Reg.#	Protected by PSV #
		sweet	sour			

Other (ESDs , Scada , UPS , Generators , MCC , Switchgear etc.

Tag #	Description	Serial #
FE-100	Endress Hauser Prowirl 72F15SM0AA4P4AB4AA Vortex Meter	F206A116000
ESDV-101	Bettis 35D-SRM100-SC Actuator with Pressure Guard Self-contained Hydraulic System and Nutron T3F20R06SZ	631768

Cranes

Tag #	Description	Serial #

Husky Energy

SEIM Data Collection - Packaged Equipment List

To be completed by Vendor

Husky P. O. #	8400432736	Vendor Job / Package No.	P1378 / CSN 11438	Project Description	Custom Large Water Transfer System

Compressor (all) / Pump (>10 HP)

Tag #	Description	Serial #
P-100	Seepex Pump Model BN-5-12V	830805.2

Driver (> 10 HP)

Tag #	Description	Serial #	Drives Tag #

Safety Valves

Tag #	Description	Serial #

Storage Tanks

Tag #	Description	Serial #

Building

Tag #	Description	Serial #
B-300	Self framing building, shed style	N/A

Pressure Equipment (Vessels, Exchangers , Fired Equipment)

Tag #	Description	Service		Serial #	Provincial Reg.#	Protected by PSV #
		sweet	sour			

Other (ESDs , Scada , UPS , Generators , MCC , Switchgear etc.

Tag #	Description	Serial #
FE-100	Endress Hauser Prowirl 72F15SM0AA4P4AB4AA Vortex Meter	F206A216000
ESDV-101	Bettis 35D-SRM100-SC Actuator with Pressure Guard Self-contained Hydraulic System and Nutron T3F20R06SZ	615824

Cranes

Tag #	Description	Serial #

Husky Energy

SEIM Data Collection - Packaged Equipment List

To be completed by Vendor

Husky P. O. #	8400432736	Vendor Job / Package No.	P1378 / CSN 11439	Project Description	Custom Large Water Transfer System

Compressor (all) / Pump (>10 HP)

Tag #	Description	Serial #
P-100	Seepex Pump Model BN-5-12V	830813.2

Driver (> 10 HP)

Tag #	Description	Serial #	Drives Tag #

Safety Valves

Tag #	Description	Serial #

Storage Tanks

Tag #	Description	Serial #

Building

Tag #	Description	Serial #
B-300	Self framing building, shed style	N/A

Pressure Equipment (Vessels, Exchangers , Fired Equipment)

Tag #	Description	Service		Serial #	Provincial Reg.#	Protected by PSV #
		sweet	sour			

Other (ESDs , Scada , UPS , Generators , MCC , Switchgear etc.

Tag #	Description	Serial #
FE-100	Endress Hauser Prowirl 72F15SM0AA4P4AB4AA Vortex Meter	F2069F16000
ESDV-101	Bettis 35D-SRM100-SC Actuator with Pressure Guard Self-contained Hydraulic System and Nutron T3F20R06SZ	631764

Cranes

Tag #	Description	Serial #

Husky Energy

SEIM Data Collection - Packaged Equipment List

To be completed by Vendor

Husky P. O. #	8400432736	Vendor Job / Package No.	P1378 / CSN 11440	Project Description	Custom Large Water Transfer System

Compressor (all) / Pump (>10 HP)

Tag #	Description	Serial #
P-100	Seepex Pump Model BN-5-12V	830815.2

Driver (> 10 HP)

Tag #	Description	Serial #	Drives Tag #

Safety Valves

Tag #	Description	Serial #

Storage Tanks

Tag #	Description	Serial #

Building

Tag #	Description	Serial #
B-300	Self framing building, shed style	N/A

Pressure Equipment (Vessels, Exchangers , Fired Equipment)

Tag #	Description	Service		Serial #	Provincial Reg.#	Protected by PSV #
		sweet	sour			

Other (ESDs , Scada , UPS , Generators , MCC , Switchgear etc.

Tag #	Description	Serial #
FE-100	Endress Hauser Prowirl 72F15SM0AA4P4AB4AA Vortex Meter	F206A316000
ESDV-101	Bettis 35D-SRM100-SC Actuator with Pressure Guard Self-contained Hydraulic System and Nutron T3F20R06SZ	615831

Cranes

Tag #	Description	Serial #

Husky Energy

SEIM Data Collection - Packaged Equipment List

To be completed by Vendor

Husky P. O. #	8400432736	Vendor Job / Package No.	P1378 / CSN 11441	Project Description	Custom Large Water Transfer System

Compressor (all) / Pump (>10 HP)

Tag #	Description	Serial #
P-100	Seepex Pump Model BN-5-12V	830806.2

Driver (> 10 HP)

Tag #	Description	Serial #	Drives Tag #

Safety Valves

Tag #	Description	Serial #

Storage Tanks

Tag #	Description	Serial #

Building

Tag #	Description	Serial #
B-300	Self framing building, shed style	N/A

Pressure Equipment (Vessels, Exchangers , Fired Equipment)

Tag #	Description	Service		Serial #	Provincial Reg.#	Protected by PSV #
		sweet	sour			

Other (ESDs , Scada , UPS , Generators , MCC , Switchgear etc.

Tag #	Description	Serial #
FE-100	Endress Hauser Prowirl 72F15SM0AA4P4AB4AA Vortex Meter	F206A516000
ESDV-101	Bettis 35D-SRM100-SC Actuator with Pressure Guard Self-contained Hydraulic System and Nutron T3F20R06SZ	615826

Cranes

Tag #	Description	Serial #

INSPECTION RELEASE

CRIMTECH Services Ltd

Inspection Release Number: 7776

Page 1 of 1

Client : Husky Energy Inc
Client Contact:
Inspection Co. Kevtec
Inspectors Name: Kevin Fundytus

Inspection Date: December 3, 2012
Project No: P1370 Batch 4
Sales Order No:
Work Order No.:

Inspection Type ☐ Internal ☐ Follow-up ☐ Externa ☐ Final

Previous Release #

☐ Travel Sheet Completed
Unit S/N: CSN 11437-11441

UNIT DESCRIPTION

Large water transfer skids

CONSTRUCTION DEFICIENCIES

NO deficiencies

DEFICIENCY REMEDIES

Deficiency items completed: _____ Date _____ Signature to Certify Complete

DESIGN CONCERNS

AUTHORIZATION TO RELEASE FROM INSPECTION

☑ Released from inspection.

☐ Release from inspection subject to completion of deficency items.

☐ Inspection required on above deficency items prior to shipping.

☐ Release from inspection denied until the above design concerns are resolved.

Follow-up Inspection Required: Yes ☐ No ☒

Crimtech Inspector's Signature

Client Inspector's Signature

December 3, 2012
Date Released From Inspection

White - File, Yellow - CSL Inspector, Pink - Client Inspector, Goldenrod - QC Manager

PRODUCTS DIVISION
Owner's Standards & Specifications – Confirmation of Use

CRIMTECH Services Ltd

The Owner's Standards & Specifications listed below are to be used on the following project:

Client:	**Husky Energy Inc.**			Project Title:	**Large Water Transfer Skids**		
Project No.:	**P1378** (Project Number)	Client No:	**PO 8400432736** (AFE or PO number)	Date:	**02/15/2012** (Month/Day/Year)	Revision:	**A**

Specification Number	Specification Title	Spec Rev	Date
General			
PS-MW-01	Welding	1	2008/11/05
PS-MW-07	Internal Coating	0	2006/09/15
PS-PF-01	Standard Piping Classes	8	2010/01/18
PS-PF-03	Valve Specifications	3c	2007/08/10
PS-PF-05	Engineering Specification – Summary of Requirements for CSA Z662 Pipeline Examination and Testing	2	2010/03/12
PS-PF-01	Piping Specification, Class AFPCH	5	2009/12/18
PS-PF-01	Piping Specification, Class BFPCH	4	2009/12/18
PS-PF-01	Piping Specification, Class CFPCH	5	2009/12/18
PS-PF-01	Piping Specification, Class AH	8	2009/12/31
Structural			
DS-CS-02	Supply and Fabrication of Structural Steel	0	2007/08/24
DS-CS-03	Erection of Steel Structures	0	2007/08/24
DS-CS-08	Steel Buildings	0	2007/08/24
Electrical			
CS-EL-01	Electrical Construction	0	2006/05/17
PS-EL-23	Electrical Requirement for Packaged Equipment	0	2003/01/17
Instrumentation			
PS-IC-03	Instrumentation for Packaged Equipment	1	2006/09/15

Note: Client specifications that have a line strikethrough (i.e. ~~specification ABC~~) are not applicable to this project. Client specifications that have are highlighted in yellow (i.e. specification XYZ) are applicable to this project

I _____ acknowledge that the above Owner's Standards & Specifications are correct and are to be used for the above mentioned project. Any changes to this list any time during the project will result in additional costs and/or increases in schedule.

Authorized by: _____ (Print Name) _____ (Signature) _____ (mm/dd/yy)

Batch 4
CSN 11437- 11441

PRODUCTS DEPARTMENT
Quality Control
Mechanical Inspection Test Plan

CRIMTECH Services Ltd

Client:	Husky Oil Operations Ltd. (Company)	8400432736 (AFE, PO, or Control No.)		Project #:	P1378		
Project Description:	Large Water Transfer Skids (Qty. 29)	Revision	0 (Rev. #)	Revision Date:	02 Mo	15 Day	12 Yr
Client Inspector:	Kentec inspections (Name)	Inspector Notified:	☒ Yes ☐ No	Notification Date:	02 Mo	17 Day	12 Yr
Client ITP Approval Required:	☒ Yes ☐ No						
Client Approval:	Dustin Langridge (Name)	Dustin Langridge (Signature)		Date:	02 Mo	15 Day	12 Yr

Ref	Activity	Activity Timing	Supporting Documentation	CSL Rep	Hold Point	Date	Client Rep	Hold Point	Date
1	ITP Approved	Prior to Welding	E-mail and ITP Sign-off	AM	QC-H	02/13/12	DL	X	02/15/12
2	Project Specifications Verified	Prior to IFC	FPF132-Owner's Standards & Spec's	KG	QC-H	02/13/12			
3	Customer's Inspector Notified	Prior to Welding	E-mail and ITP Sign-off	AM	QC-H	02/13/12	DL	X	02/15/12
4	IFC drawings received and reviewed	Prior to Welding	IFC Drawings	KG	QC-H	02/8/12			
5	WPS(s) Approved CRIM- 10	Prior to Welding	WPS/PQR	KG	QC-R	02/8/12			
6	Welders Qualified to WPS(s)	Prior to Welding	QCF105 ASME Welder Log / WPQ Cards	KG	QC-R	2/8/12			
7	Material receiving inspection complete	During Fabrication	Quality Control Program / MTRs / PO	MH	PS-R	4/4/12			
8	MTRs Checked & Traceable	Prior to Welding	QCF 202 MTR Log / MTRs / Certificates	KG	PS-R QC-R	04/04/12			
9	Piping Layout & Dimensional verification	During Fit-up	IFC Drawings (Note 1)	KG	PS-H QC-M	4/4/12			
10	100% visual inspection of welds	After Welding	IFC Drawings (Note 1)	KG	PS-E QC-E	4/4/12		E	
11	All welds identified and spools tagged	During Welding	Weld Maps / IFC Drawings	KG	QC-M	4/4/12			
12	NDE, Radiography, reviewed.	After Welding	NDE Reports / Weld Maps	KG	QC-R/M	4/5/12		R/M	APR 17/12
13	Hydro Test Piping	After Fabrication Completion	QCF 112 Hydrostatic Test Report	KG	QC-H	4/17/12		W/H	APR. 17/12
14	Mechanical Scope of Work Complete	Prior to Shipment	ITP / FPF 123 Separator-Meter Unit Travel Sheet	KG	QC-E PS-E	12/3/12			
15	Flanges Properly Torqued	During Mechanical Assembly	ITP	MH	TM-E PS-E	12/3/12			

Hold Point Codes:
Crimtech Rep: QC = QC Personnel PS= Production Supervisor FM = Fabrication Manager PM = Project Manager TM = Tradesman DE = Designer or Estimator
Hold Points: H = Hold W = Witness E = Examine R = Review N = Notify M = Monitor/Surveillance
Form Last Revised: 01/15/2010 Next Form Review: January 2012
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Batch 4
CSN 11437 - 11441

PRODUCTS DEPARTMENT
Quality Control
Mechanical Inspection Test Plan

CRIMTECH Services Ltd

Ref	Activity	Activity Timing	Supporting Documentation	CSL Rep	Hold Point	Date	Client Rep	Hold Point	Date
16	Instrument Scope of Work Complete	After Fabrication Completion	FPF 123 Separator-Meter Unit Travel Sheet	MM	TM-E PS-M	12/1/12			
17	Electrical Scope of Work Complete	After Fabrication Completion	FPF 123 Separator-Meter Unit Travel Sheet	MM	PS / QC-H	12/1/12			
18	Verification of Final Fit-Up	Prior to Shipment	QCF 205 Dry Fit Verification Report	N/A	QC-H FM-H	N/A	[signature]	H	Jan 30/13
19	Tie-In Flanges Properly Aligned	Prior to Shipment	QCF 215 Flange Tie-in Verification Report	KG	QC-H FM-H	12/3/12			
20	Major Equipment Serial Numbers Recorded	Prior to Shipment	FPF 123 Separator-Meter Unit Travel Sheet	KG	QC-H FM-H	12/3/12			
21	QC Documentation Complete	Project Closeout	QCF 405 Document Control Worksheet	KG	QC-H	4/28/13	[signature]	H	DEC 3/12
22	Release for shipment	Project Closeout	ITP / CCF 106 Inspection Release Form	KG	QC-H	12/3/12	[signature]		DEC 3/12
23	All Openings Covered for shipping & adequately supported	Shipping	FPF 123 Separator-Meter Unit Travel Sheet	MM	PS-H	12/3/12			
24	Non-Conformances	As Required	QCF 108 Nonconformity Report	N/A	All-H	N/A			

Comments: ☐ Additional Information Attached

Note 1: Piping Spool Checklist on each individual piping spool drawing is initialed.

Inspection Test Plan Verified Complete:

Client Accepted: K. FLINOYTUS (Name) _____ (Signature) Date: 01 (Mo) 30 (Day) 2013 (Yr)

QCM Accepted: Craig Nykyforuk (Name) _____ (Signature) Date: 01 (Mo) 30 (Day) 2013 (Yr)

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Batch 4
CSN 11437 - 11441

PRODUCTS DEPARTMENT
Quality Control
Structural Inspection Test Plan

CRIMTECH Services Ltd

Client:	Husky Oil Operations Ltd. (Company)		8400432736 (PO, AFE or Control Number)			Project #:	P1378		
Project Description:	Large Water Transfer Skids (Qty. 29)			Revision	0 (Rev. #)	Revision Date:	02 Mo	15 Day	12 Yr
Client Inspector:	Vertec Inspection (Name)			Inspector Notified:	☒ Yes ☐ No	Notification Date:	02 Mo	17 Day	12 Yr
Client ITP Approval Required:	☒ Yes ☐ No								
Client Approval:	Dustin Langridge (Name)		Dustin Langridge (Signature)			Date:	02 Mo	15 Day	12 Yr

Ref	Activity	Activity Timing	Supporting Documentation	CSL Rep	Hold Point	Date	Client Rep	Hold Point	Date
1	ITP Approved	Prior to Welding	E-mail and ITP Sign-off	AM	QC-H	02/17/12	DL	X	02/15/12
2	Project Specifications	Prior to IFC	FPF132-Owner's Standards & Spec's	KG	QC-H	2/12/12			
3	Customer's Inspector Notified	Prior to Welding	E-mail and ITP Sign-off	AM	QC-H	02/17/12	DL	X	02/15/12
4	IFC drawings received and reviewed	Prior to Welding	E-mail and ITP Sign-off	KG	QC-H	2/8/12			
5	CWB WPS(s) Approved Structural FC-1 & SM-1	Prior to Welding	CSA W59 / W47.1 WPDS	KG	QC-H	2/8/12			
6	Welders Qualified to WPS(s)	Prior to Welding	CSA W59 / W47.1 Welder Qualification Test Record	KG	QC-H	2/8/12			
7	Skid Layout & Dimensional verification	During Fit-up	IFC Drawings / ITP	[illegible]	PS-H QC-H	[illegible]			
8	100% visual inspection welding on skid	During Welding	ITP	KG	PS-H QC-M	4/2/12	[illegible]	M	APR. 12/12 TOP SIDE ONLY
9	MPI: 100% Lifting Lugs	After Welding	NDE Reports / ITP	KG	QC-R/M	4/2/12	[illegible]	R/M	[illegible]
10	All sharp edges are ground off to a 3 mm (1/8") radius	Prior to Sandblasting	ITP	[illegible]	PS-H	12/1/12			
11	Non-Conformances	As Required	QCF 108 Nonconformity Report	N/A	All-H	N/A			

Comments: ☐ Additional Information Attached

Hold Point Codes:
Crimtech Rep: QC = QC Personnel PS= Production Supervisor FM = Fabrication Manager PM = Project Manager TM = Tradesman DE = Designer or Estimator
Hold Points: H = Hold W = Witness E = Examine R = Review N = Notify M = Monitor/Surveillance
Form Last Revised: 09/21/2010 Next Review: September 2011
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Batch 4
CSN 11437 - 11441

PRODUCTS DEPARTMENT
Quality Control
Structural Inspection Test Plan

CRIMTECH Services Ltd

Inspection Test Plan Verified Complete:

Client Accepted:	K. FUNOYTUS (Name)	(Signature)	Date:	01 Mo	30 Day	2013 Yr
QCM Accepted:	Craig Nykfaak (Name)	(Signature)	Date:	01 Mo	30 Day	2013 Yr

Hold Point Codes:
Crimtech Rep: QC = QC Personnel PS= Production Supervisor FM = Fabrication Manager PM = Project Manager TM = Tradesman DE = Designer or Estimator
Hold Points: H = Hold W = Witness E = Examine R = Review N = Notify M = Monitor/Surveillance
Form Last Revised: 09/21/2010 Next Review: September 2011
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Batch 4
CSN 11437 - 11441

PRODUCTS DEPARTMENT
Quality Control
Coating Inspection Test Plan

CRIMTECH Services Ltd

Client:	Husky Oil Operations Ltd. (Company)	8400432736 (AFE, PO, or Control No.)		Project #:	P1378			
Project Description:	Large Water Transfer Skids (Qty. 29)	Revision	0 (Rev. #)	Revision Date:	02 Mo	15 Day	12 Yr	
Client Inspector:	Kevtec inspection (Name)	Inspector Notified:	☒ Yes ☐ No	Notification Date:	02 Mo	17 Day	12 Yr	
Client ITP Approval Required:	☒ Yes ☐ No							
Client Approval:	Dustin Langridge (Name)	Dustin Langridge (Signature)		Date:	02 Mo	15 Day	12 Yr	

Ref	Activity	Activity Timing	Supporting Documentation	CSL Rep	Hold Point	Date	Client Rep	Hold Point	Date
1	ITP Approved	Prior to Blasting	E-mail and ITP Sign-off	AM	QC-H	02/17/12	DL	X	Feb/15/12
2	Project Specifications Verified	Prior to IFC	FPF132-Owner's Standards & Spec's	KG	QC-H	04/17/12			
3	Customer's Inspector Notified	Prior to Coating	E-mail and ITP Sign-off	AM	QC-H	02/17/12			
4	Abrasive Blast Cleaning in accordance with SSPC SP-6. Ensure profile measurements are recorded.	Prior to Coating	QCF 210 Surface Blast Inspection Reports QCF 211 Surface Blast Profile Log	[illegible]	PS-H QC-H	12/3/12			
5	Dew Point and ambient temperatures recorded	Prior to Coating	QCF 212 Coating Inspection Report	[illegible]	PS-H QC-H	12/3/12			
6	First coat inspection and DFT measurements are recorded.	Prior to Top Coat	QCF 212 Coating Inspection Report	[illegible]	PS-H QC-H	12/3/12			
7	Final Coat inspection and DFT measurements are recorded.	After Final Coat	QCF 212 Coating Inspection Report	[illegible]	PS-H QC-H	12/3/12			
8	QC Documentation Complete	Project Closeout	QCF 405 Document Control Worksheet	KG	QC-H	01/28/13			
9	Non-Conformances	As Required	QCF 108 Nonconformity Report	N/A	All-H	N/A			

Comments: ☐ Additional Information Attached

Inspection Test Plan Verified Complete:

Client Accepted:	R. FUNDYTUS (Name)	(Signature)	Date:	01 Mo	30 Day	2013 Yr
QCM Accepted:	Craig Nykyforuk (Name)	(Signature)	Date:	01 Mo	30 Day	2013 Yr

Hold Point Codes:
Crimtech Rep: QC = QC Personnel PS = Production Supervisor FM = Fabrication Manager PM = Project Manager TM = Tradesman DE = Designer or Estimator
Hold Points: H = Hold W = Witness E = Examine R = Review N = Notify M = Monitor/Surveillance
Form Last Revised: 09/21/2009. Next Form Review September 2011
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Petker Coatings Ltd

CRIMTECH SERVICES LTD.
RECEIVED
June 4, 2012

Customer: Crimtech Services Ltd.
P.O. No.: N/A
Crimtech Job #: P1378, Spool #,s 24720-24809
Coating System: Devchem 268

Inspection and Test Plan
Petker Coatings Project #13-001 Phase 2
Pipe Spools - Internal Coating
ITP No.: Petker 12-299 Rev No. 0

Task No.	Description	Petker Inspection Codes	Petker Initials & Date	Third Party Inspection Codes	Inspector's Initial & Date	Crimtech Inspection Codes	Crimtech Initials & Dates	Acceptance Criteria	Verifying Documents
	PRE-COATING REVIEW								
1	ITP Review	HP	AH 4/23/12	HP	AS 4/23/12	HP		Husky Specification PS-MW-07; Devchem 268 PDS	ITP
2	Review of Project Scope of Work	HP, DR1	AH 4/23/12	DR1	AS 4/23/12	DR2		Husky Specification PS-MW-07; Devchem 268 PDS.	ITP
3	Devchem 268 Application Guidelines	HP, DR1	AH 4/23/12	DR1	AS 4/12/23	DR2		Devchem 268 PDS	ITP
	Surface Preparation and Coating Application								
4	Steel Substrate	IN1	AH 4/23/12	IN2, DR1	AS 4/23/12	DR2		Husky Specification PS-MW-07; Devchem 268 PDS.	ITP & Petker QC Form
5	Spool Numbers Visible and Traceable	IN1	AH 4/23/12	IN2, DR1	AS 4/23/12	DR2		Husky Specification PS-MW-07; Devchem 268 PDS.	ITP & Petker QC Form
6	Flange Faces Protected	IN2	AH 4/23/12	IN2, DR1	AS 4/23/12	DR2		Husky Specification PS-MW-07; Devchem 268 PDS.	ITP & Petker QC Form
7	Abrasive Blast Surface Preparation Quality	HP, IN1	AH 4/23/12	HP, DR1	AS 4/23/12	IN2, DR2		Husky Specification PS-MW-07; Devchem 268 PDS.	ITP & Petker QC Form
8	Surface Profile	HP, IN1	AH 4/23/12	HP, DR1	AS 4/23/12	DR2		Husky Specification PS-MW-07; Devchem 268 PDS.	ITP & Petker QC Form
9	Environmental Conditions	IN1	AH 4/23/12	DR1	AS 4/23/12	DR2		Husky Specification PS-MW-07; Devchem 268 PDS.	ITP & Petker QC Form
10	Devchem 268 - Application Per Coat	HP, IN1	AH 4/23/12	DR1	AS 4/30/12	DR2		Husky Specification PS-MW-07; Devchem 268 PDS.	ITP & Petker QC Form

Code: IN1 - Full Inspection IN2 - Random Inspection HP - Hold Point DR1 - Full Review of Documentation DR2 - Random Review of Documentation
NA- Not Applicable

Customer: Crimtech Services Ltd.
P.O. No.: N/A
Crimtech Job #: P1378, Spool #,s 24720-24809
Coating System: Devchem 268

Inspection and Test Plan
Petker Coatings Project #13-001 Phase 2
Pipe Spools - Internal Coating
ITP No.: Petker 12-299 Rev No. 0

Task No.	Description	Petker Inspection Codes	Petker Initials & Date	Third Party Inspection Codes	Inspector's Initial & Date	Crimtech Inspection Codes	Crimtech Initials & Dates	Acceptance Criteria	Verifying Documents
	FINAL INSPECTION								
11	Coating DFT Thickness Confirmation	HP, IN1	AH 4/30/12	HP, DR1	AH 4/30/12	IN2, DR2		Husky Specification PS-MW-07; Devchem 268 PDS.	ITP & Petker QC Form
12	Holiday Test - Devchem 268	HP,IN1	AH 4/30/12	HP, DR1	AH 4/30/12	DR2		Husky Specification PS-MW-07; Devchem 268 PDS.	ITP & Petker QC Form
13	Repair of Devchem 268	HP,IN1	AH 4/30/12	HP, DR1	AH 4/30/12	DR2		Husky Specification PS-MW-07; Devchem 268 PDS.	ITP & Petker QC Form
14	Internals Clean and Debris Free	IN1	AH 4/30/12	DR1	AH 4/30/12	DR2		Husky Specification PS-MW-07; Devchem 268 PDS.	ITP & Petker QC Form
15	Flange Openings Covered and Protected	IN1	AH 4/30/12	DR1	AH 4/30/12	DR2		Husky Specification PS-MW-07; Devchem 268 PDS.	ITP & Petker QC Form
16	Release For Shipment	HP, DR1	AH 4/30/12	HP	AH 4/30/12	DR2		Husky Specification PS-MW-07; Devchem 268 PDS.	ITP & Petker QC Form
	FINAL DOCUMENTATION								
17	Turnover Documentation	HP, DR1		DR1		DR2		Husky Specification PS-MW-07; Devchem 268 PDS.	ITP & Petker QC Form

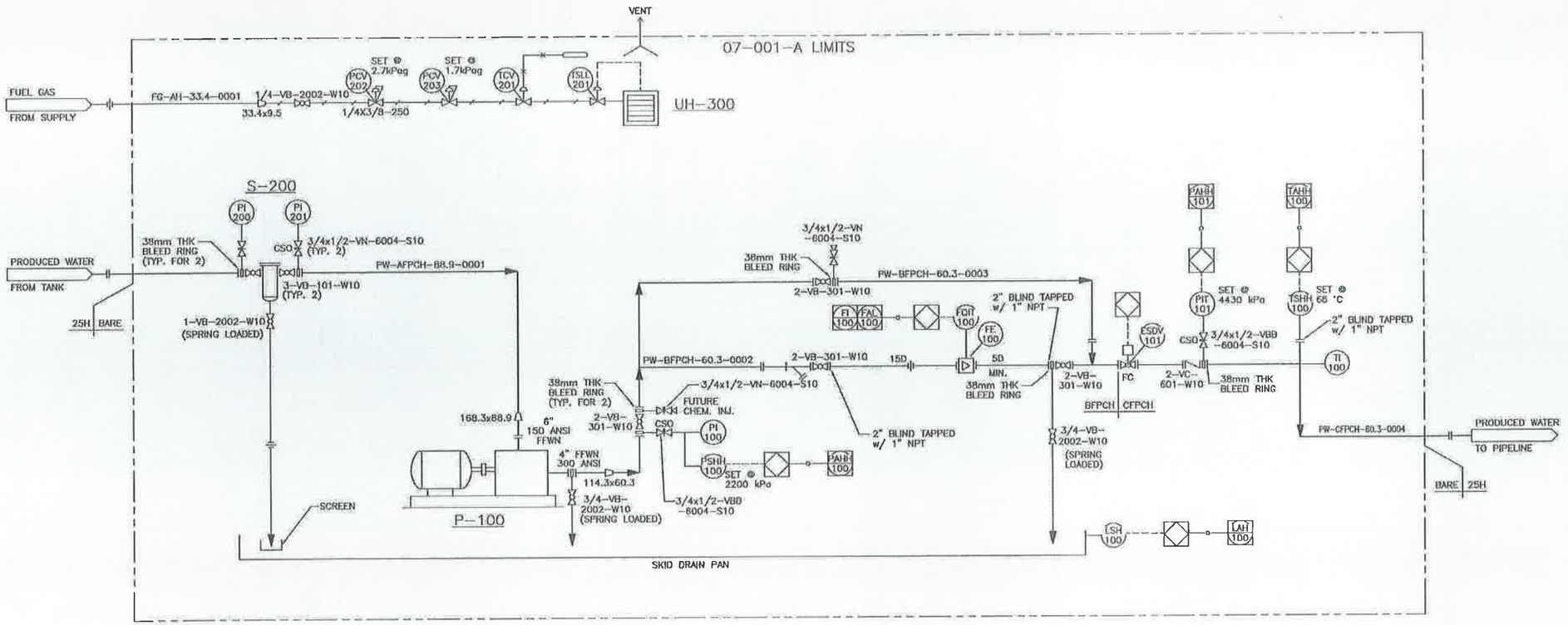
Code: IN1 - Full Inspection IN2 - Random Inspection HP - Hold Point DR1 - Full Review of Documentation DR2 - Random Review of Documentation
NA- Not Applicable

S-200
BASKET STRAINER
88.9mmø 150 ANSI
0.125" PERFORATED BASKET
C/W 22.4mm TAP FOR DRAIN

P-100
WATER TRANSFER PUMP
PROGRESSIVE CAVITY PUMP
MAKE: SEEPEX
MODEL: BN17-12V/A6-A7-A7-FO-A-X
CAPACITY: 250cu.m/day @ 293rpm
DRIVE: HYDRAULIC, 19gpm at 1500psi for 300rpm
TRIM: 316 SS
MAX DISCHARGE PRESSURE: 2413 kPag

UH-300
BUILDING HEATER
TYPE: CATADYNE HEATER
MODEL: WX 18x24
DUTY: 12000 BTU/HOUR

07-001-A
WATER TRANSFER SKID
MAKE: CRIMTECH
MODEL: M01-2668-VMT-000-CEP
SIZE: 2108mmLx2794mmWx2750mmH
DESIGNED : 2007
PUMP STYLE : A



CRIMTECH SERVICES LTD.
ISSUED FOR CONSTRUCTION
FEB 15 2012
DESTROY ALL PREVIOUS DRAWINGS
Project No.: P1378
Signed:

NOTES
1. MAXIMUM INLET PRESSURE 266 psig. UNIT DESIGNED TO 1440 psig.
2. ALL INSTRUMENTS ARE VENTED OUTSIDE.
3. UNIT DESIGNED TO MEET HUSKY PIPING SPECIFICATIONS AS SHOWN. EXCEPTIONS: NO LOW TEMP MATERIALS TO BE USED
4. SET PRESSURES EXCLUDING PSV'S TO BE FIELD SET.
5. DRAIN LINES ARE TO BE CAPPED FOR HYDROTEST.

BAR Engineering

ENGINEERING COMPANY PERMIT STAMP	REGISTERED PROFESSIONAL ENGINEER STAMP

REF	DRAWING NUMBER	DRAWING TITLE

REFERENCE DRAWINGS

REV	DATE	DESCRIPTION	BY	CHK	ENG	APR
3	2011/10/18	ISSUED FOR APPROVAL FOR EWR 14846 BAR 10-0252	BAR	BAR	BAR	BAR
2	2009/12/09	STANDARD TYPICAL DRAWINGS FOR 2007 FLOWLINE PROJECTS AS-BUILT	BAR	BAR	BAR	BAR
1	2007/04/11	STANDARD TYPICAL DRAWINGS FOR 2007 FLOWLINE PROJECTS CONSTRUCTION	BAR	BAR	BAR	BAR

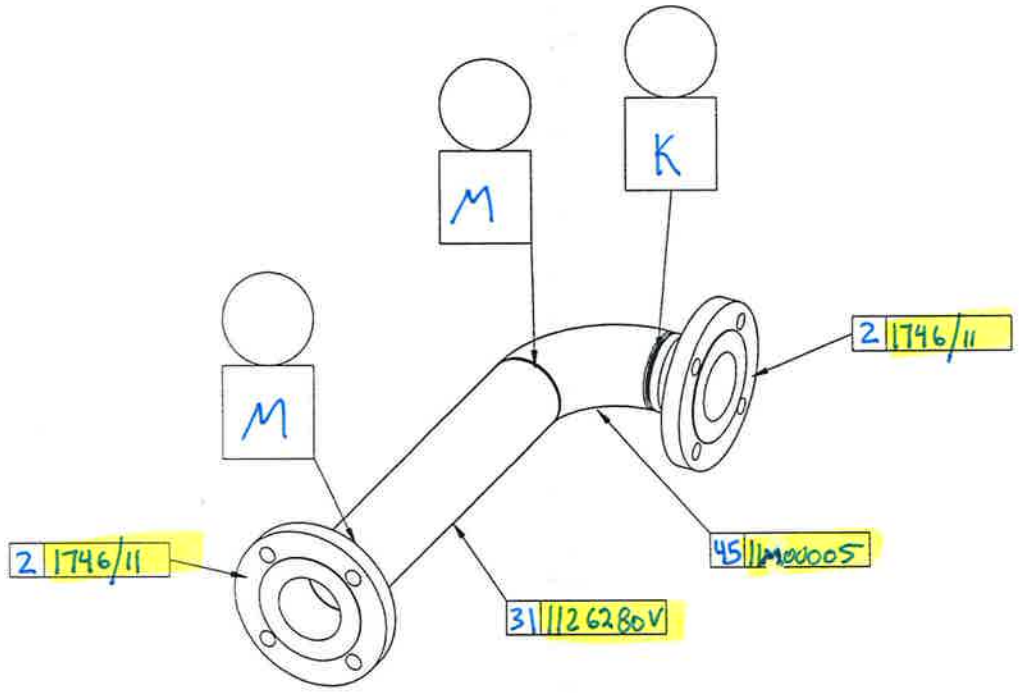
REVISION HISTORY

Husky Oil Operations Limited

111/13-17-048-21W3/00 SWB

TITLE: WATER TRANSFER SKID
PIPING & INSTRUMENTATION DIAGRAM

SURFACE LOCATION	13-17-048-21W3	
ALTERNATE DWG NUMBER		REV NO
HUSKY DWG NUMBER	13-17-048-21W3-PI-0002-01	3
VENDOR DWG NUMBER		SCALE
AMU/FLOC NUMBER		NTS
DCN NO	PROJECT NO EWR 14846	



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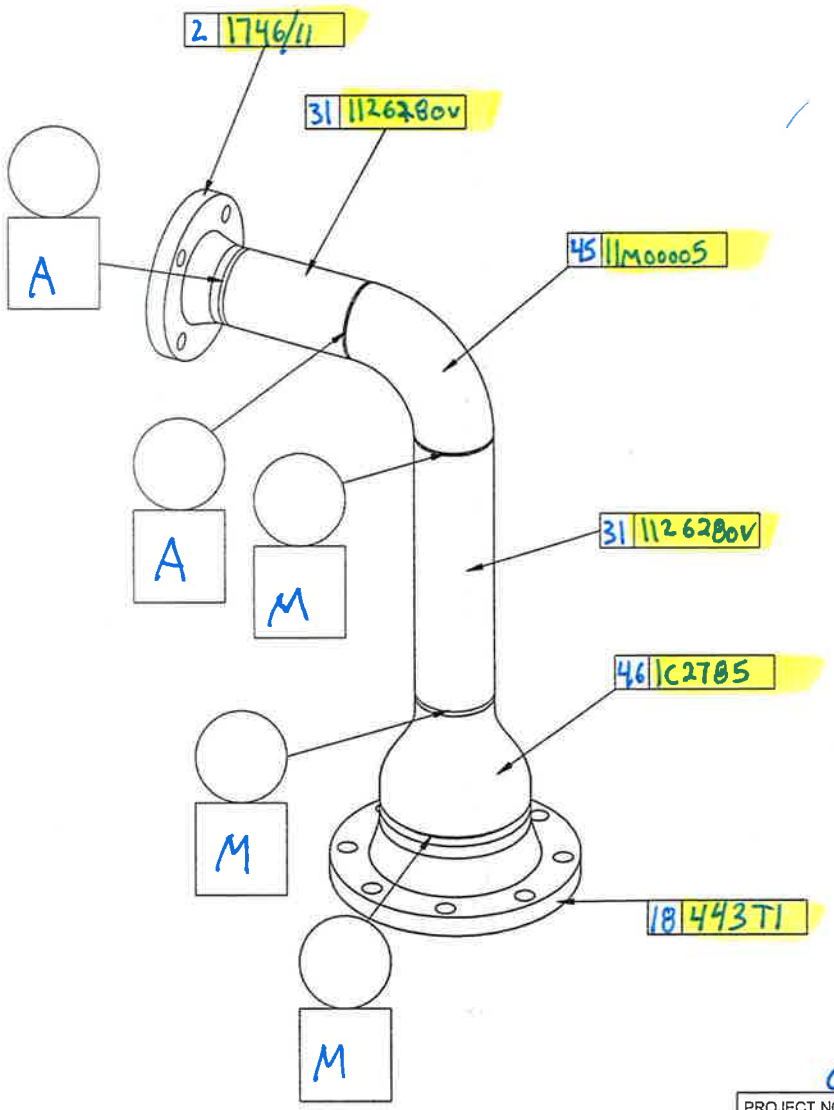
MTR LOG # = [ ] = HEAT NUMBER

CSN 11439

PROJECT NO.: P1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
CLIENT NO.: 8400432736	
SPOOL NO.: 24783	DRAWING NO.: 1024910-WM-01A



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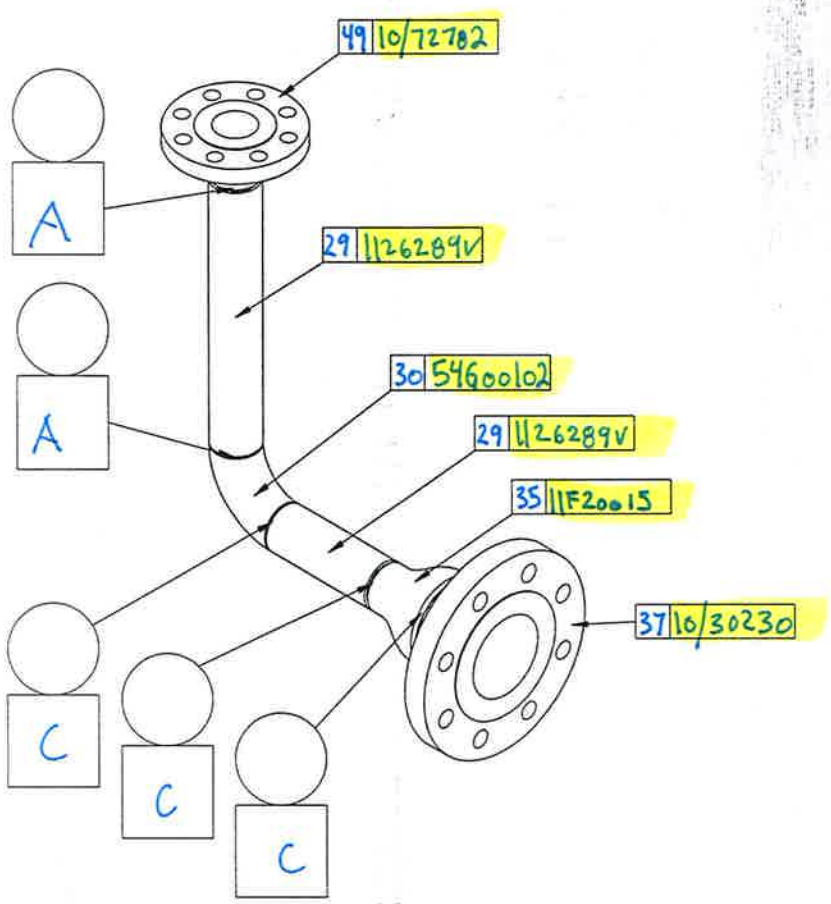
MTR LOG # = [ ] = HEAT NUMBER

CSN 11439

PROJECT NO.: P 1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
CLIENT NO.: 8400432736	
SPOOL NO.: 24784	DRAWING NO.: 1024910-WM-01B



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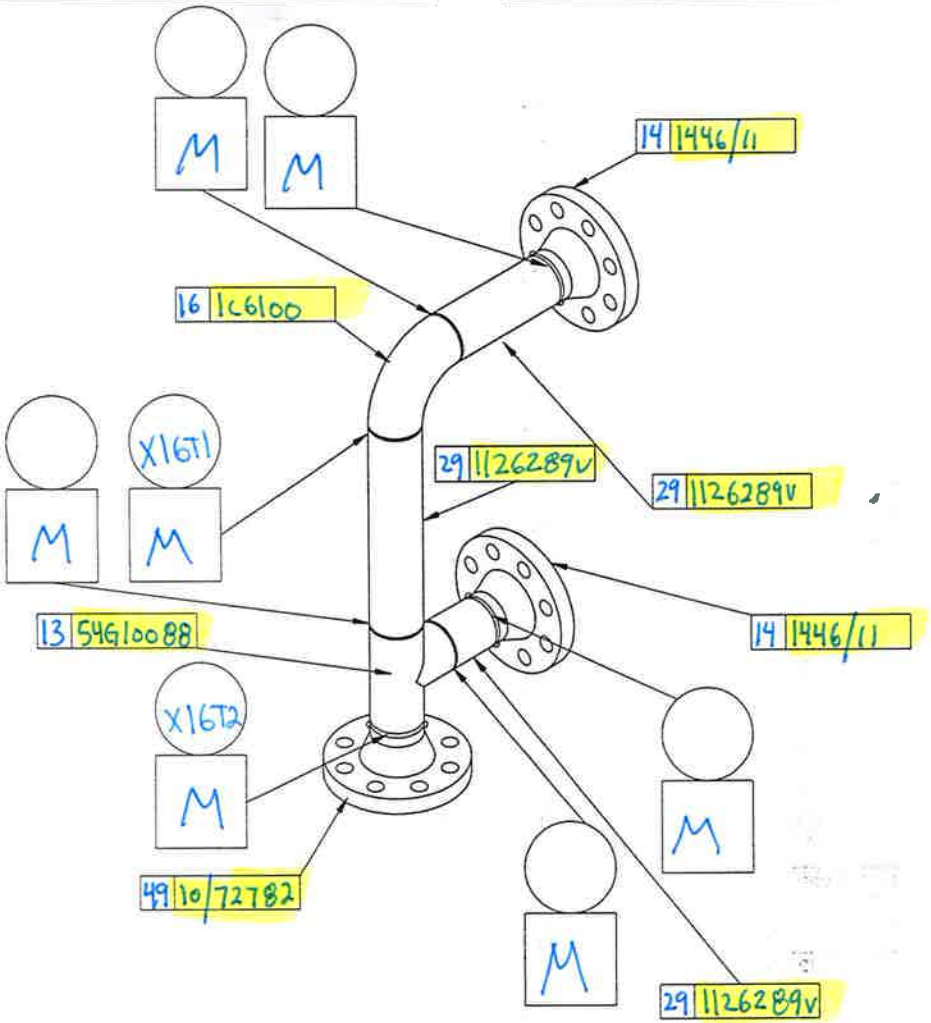
MTR LOG # = [ ] = HEAT NUMBER

CSN 11439

PROJECT NO.: P1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
CLIENT NO.: 8400432736	
SPOOL NO.: 24794	DRAWING NO.: 1024910-WM-03A



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MTR LOG # = [ ] = HEAT NUMBER

CSN 11439

PROJECT NO.: P1378	CRIMTECH Services Ltd
CLIENT NO.: 8400432736	WWW.CRIMTECH.COM PH 1-800-993-9958
SPOOL NO.: 24804	DRAWING NO.: 1024910-WM-03B

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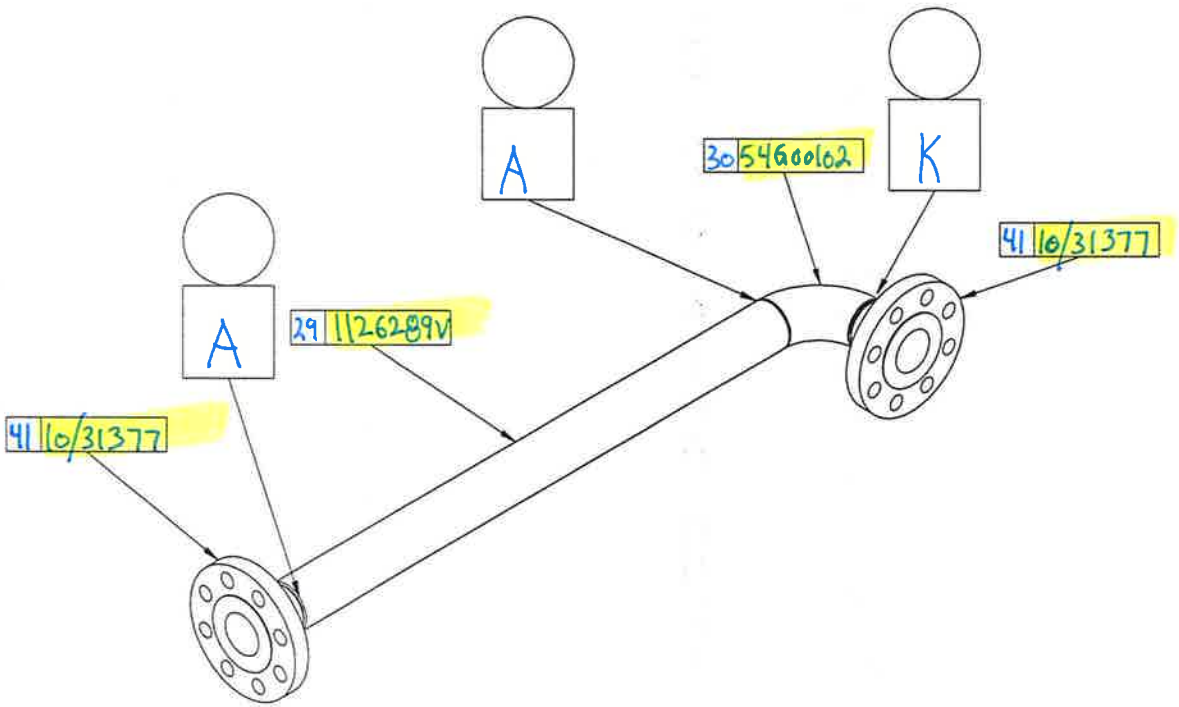

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MTR LOG # = = HEAT NUMBER

CSN 11439

PROJECT NO.: P1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
CLIENT NO.: 8400432736	
SPOOL NO.: 24778	DRAWING NO.: 1024910-WM-05A

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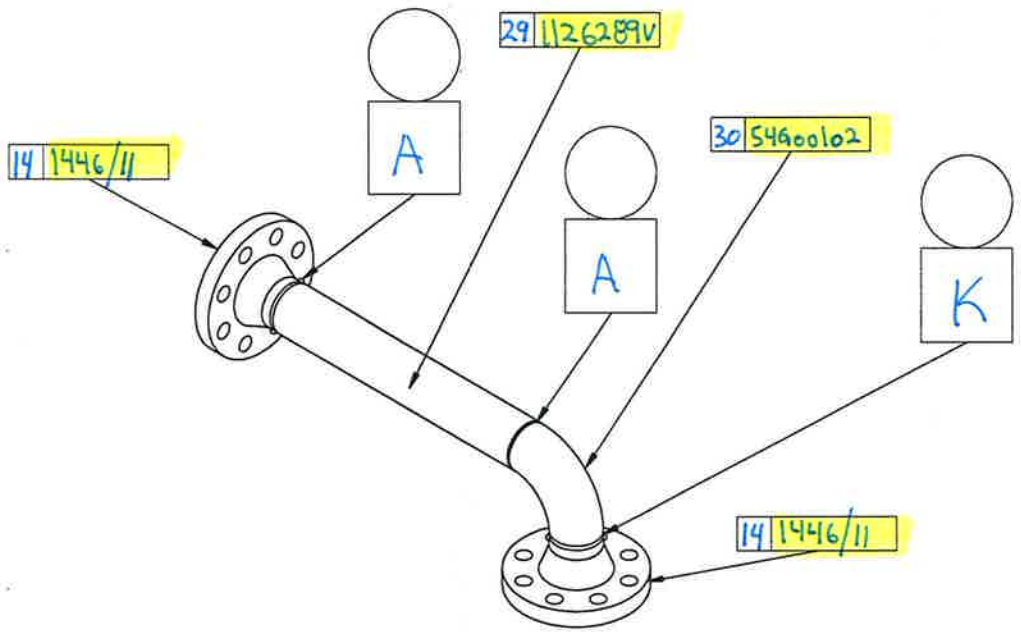

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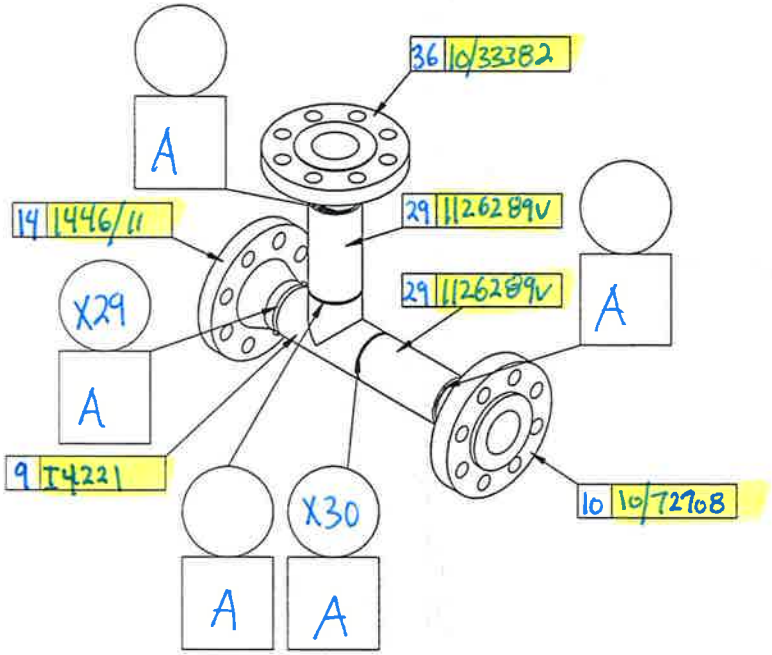
MTR LOG # = [ ] = HEAT NUMBER

CSN 11439

PROJECT NO.: P 1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
CLIENT NO.: 8400432736	
SPOOL NO.: 24806	DRAWING NO.: 1024910-WM-05B



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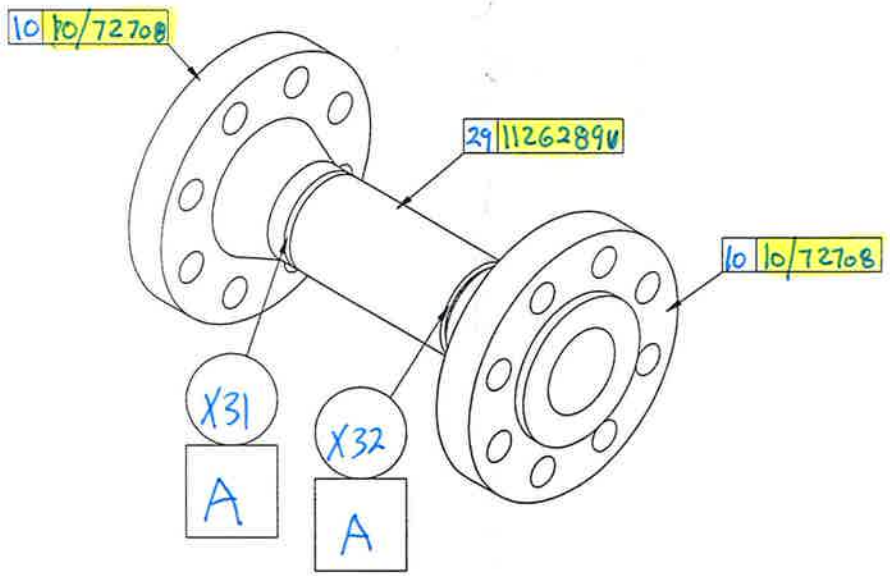
MTR LOG # = | | = HEAT NUMBER

CSN 11439

PROJECT NO.: P 1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
CLIENT NO.: 8400432736	
SPOOL NO.: 24789	DRAWING NO.: 1024910-WM-06A



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MTR LOG # = | | = HEAT NUMBER

CSN 11439

PROJECT NO.: P1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
CLIENT NO.: 8400432736	
SPOOL NO.: 24790	DRAWING NO: 1024910-WM-06B

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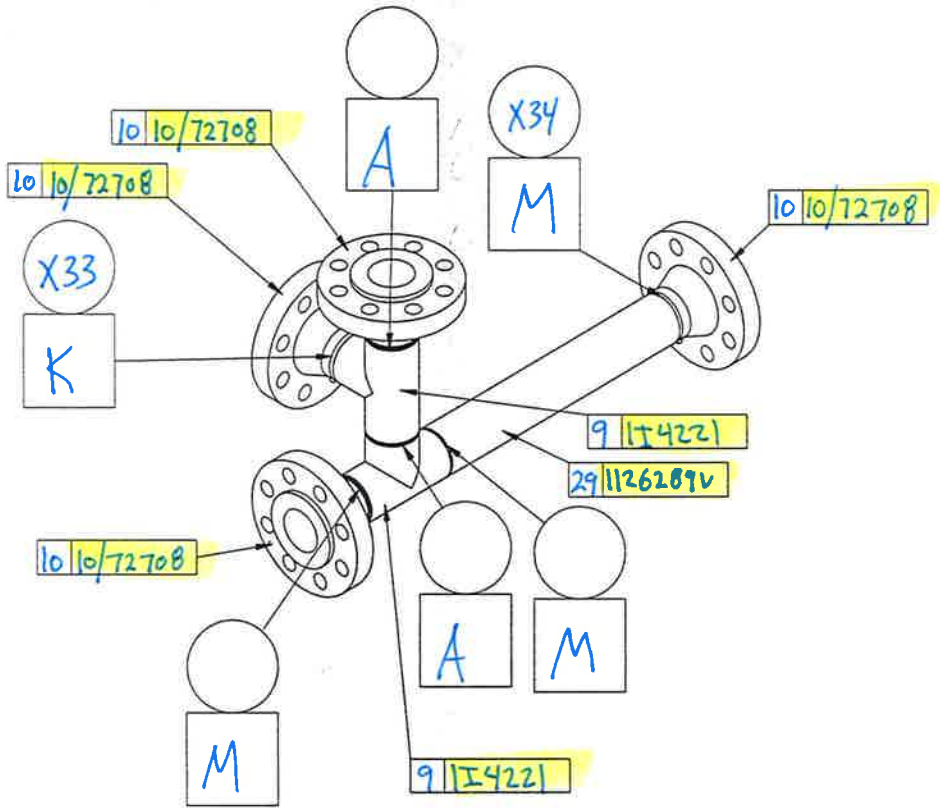

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MTR LOG # = = HEAT NUMBER

CSN 11439

PROJECT NO.: P 1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
CLIENT NO.: 8400432736	
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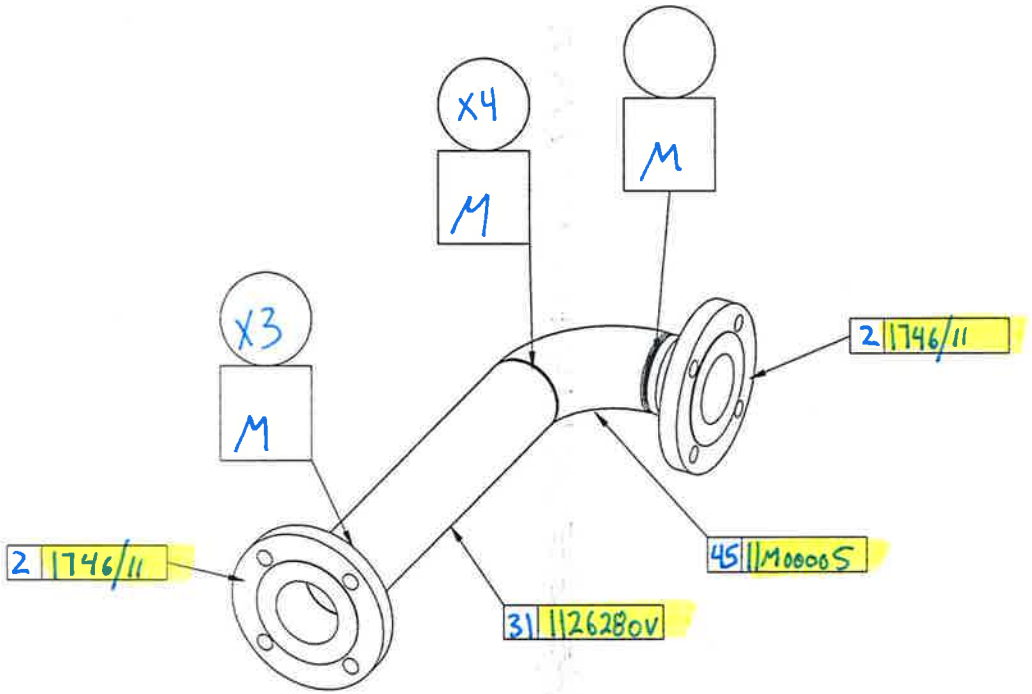

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CSN 11440

PROJECT NO.: P1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
CLIENT NO.: 8400432736	
SPOOL NO.: 24792	DRAWING NO.: 1024910-WM-01A

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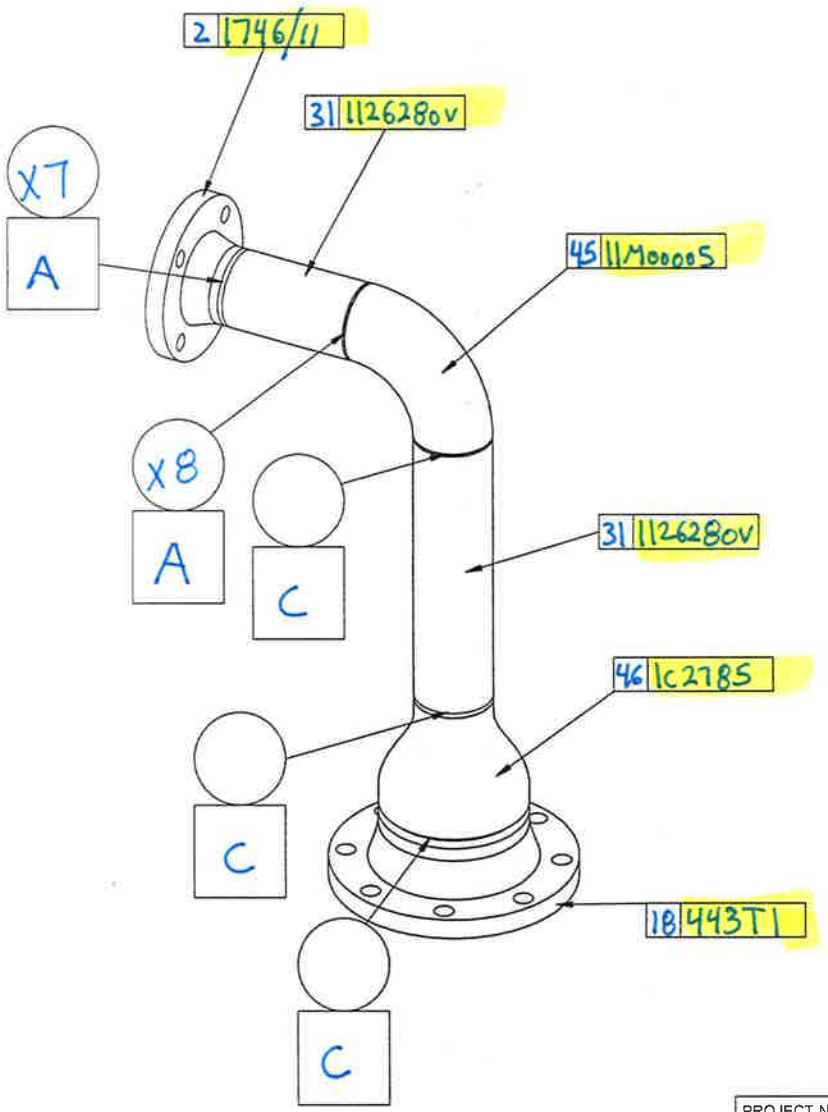

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CSN 11440

PROJECT NO.: P1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
CLIENT NO.: 8400432736	
SPOOL NO.: 24802	DRAWING NO.: 1024910-WM-01B

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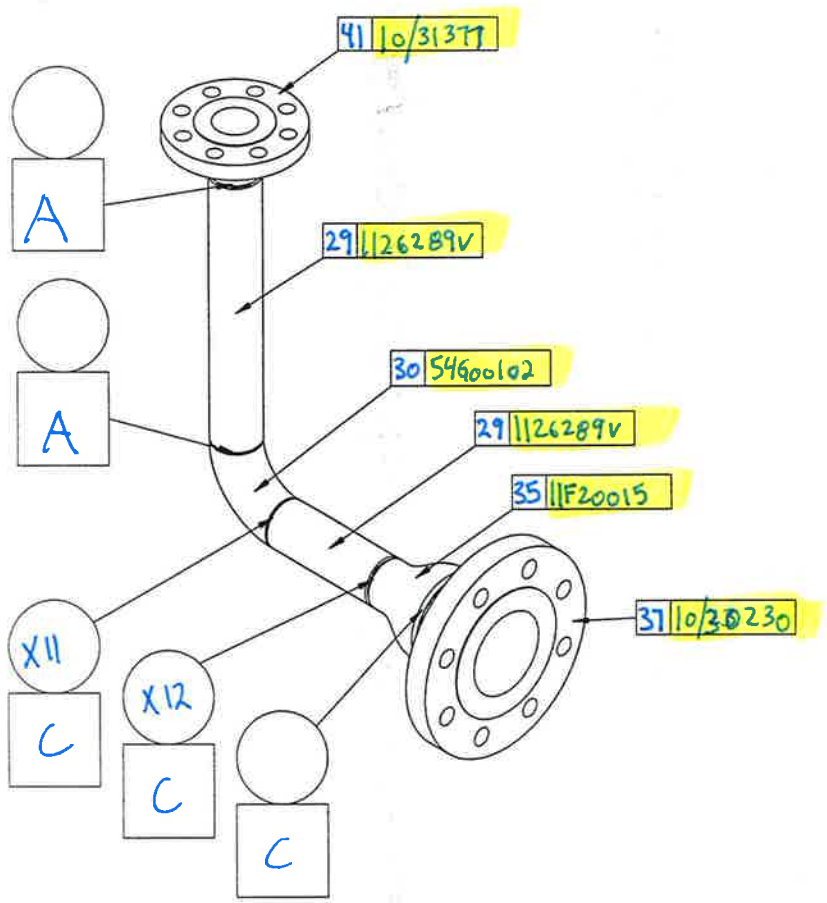

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CSN 11440

PROJECT NO.: P1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
CLIENT NO.: 8400432736	
SPOOL NO.: 24785	DRAWING NO.: 1024910-WM-03A

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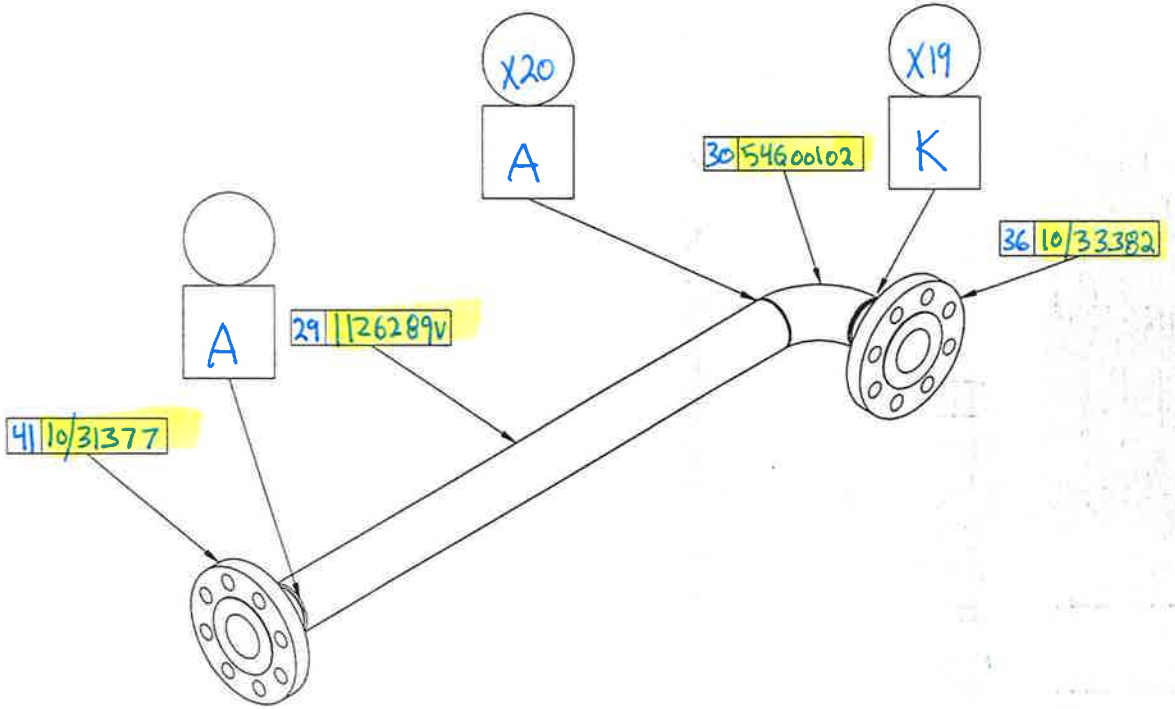

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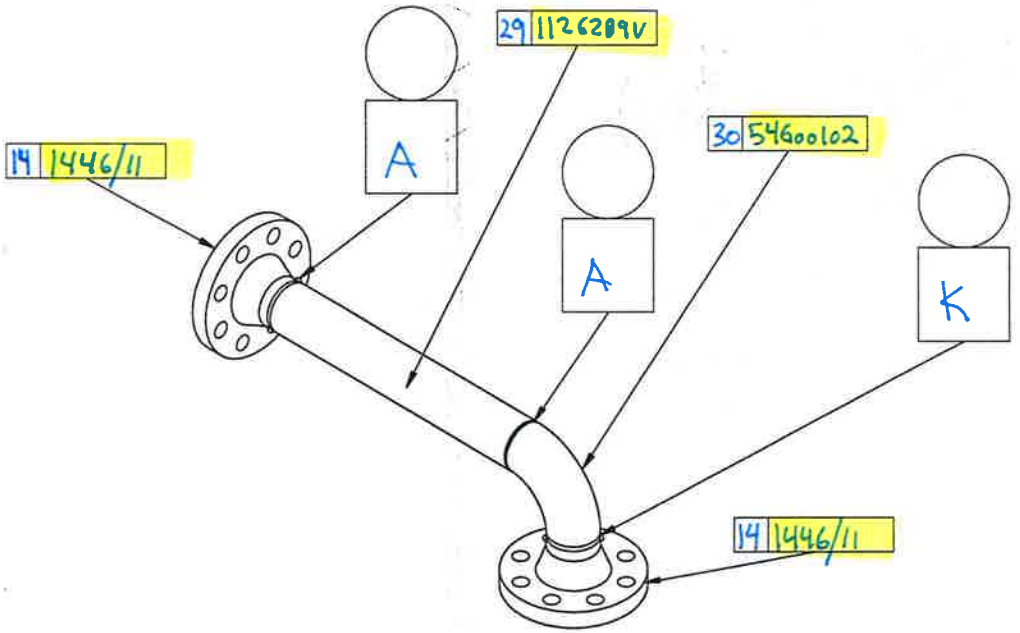
CSN 11440

PROJECT NO.: P1378	CRIMTECH Services Ltd
CLIENT NO.: 8400432736	WWW.CRIMTECH.COM PH 1-800-993-9958
SPOOL NO.: 24787	DRAWING NO.: 1024910-WM-05A



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CSN 11440

PROJECT NO.: P1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
CLIENT NO.: 8400432736	
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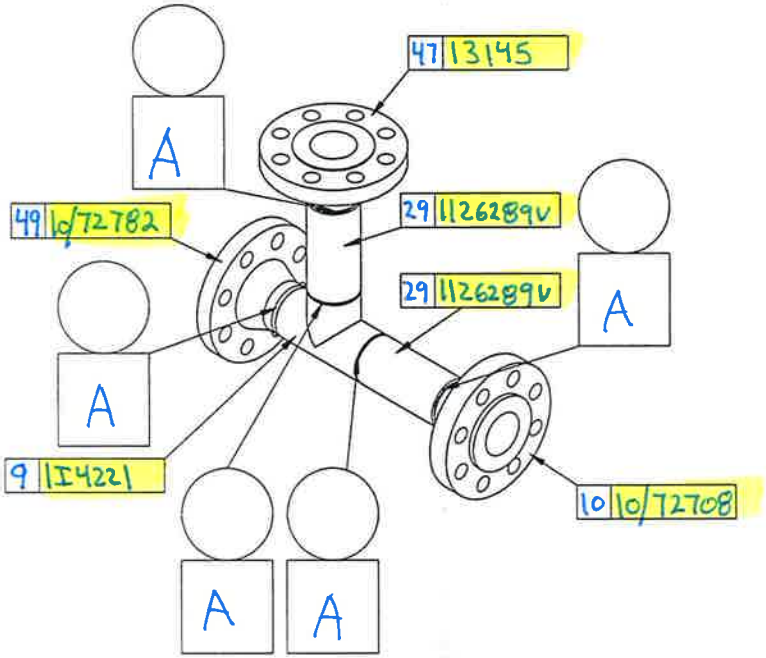

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CSN 11440

PROJECT NO.: P1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
CLIENT NO.: 8400432736	
SPOOL NO.: 24780	DRAWING NO.: 1024910-WM-06A

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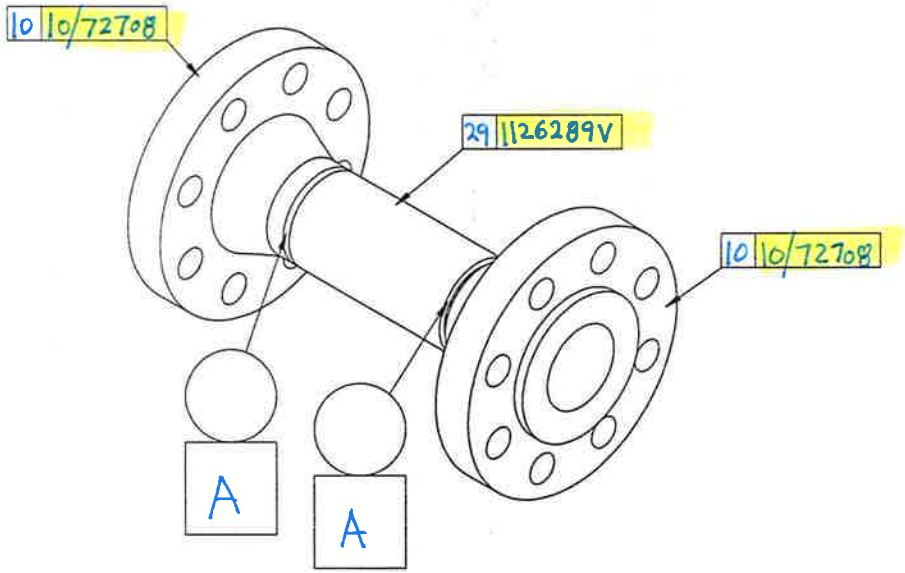

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PROJECT NO.: P1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
CLIENT NO.: 8400432736	
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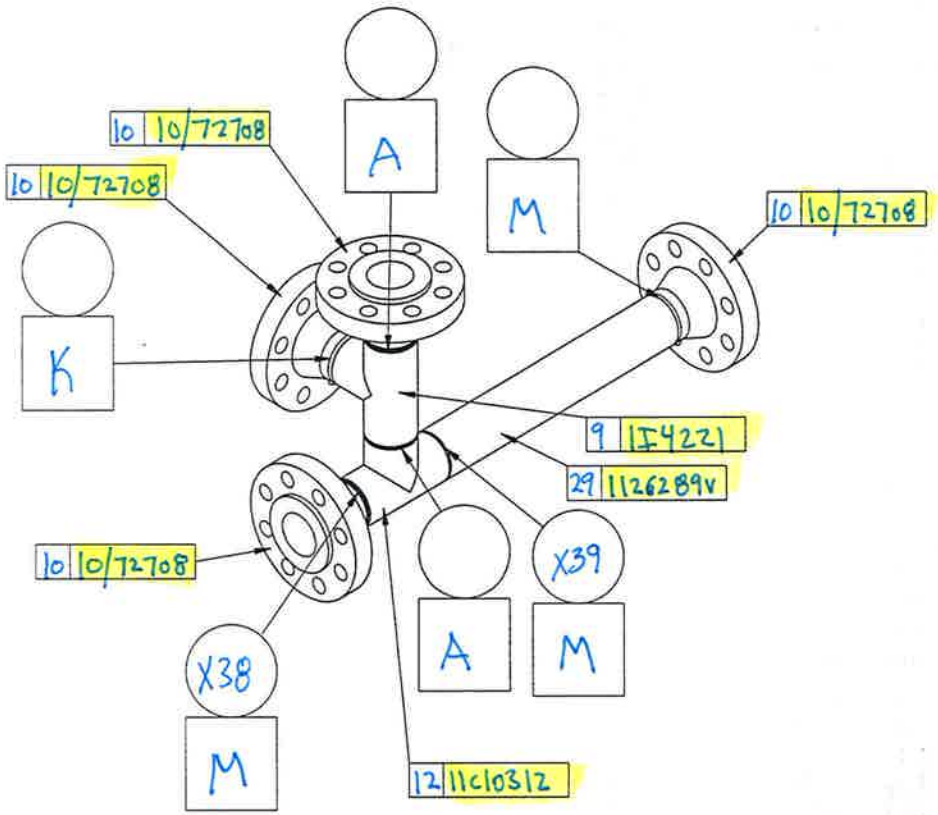

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CSN 11440

PROJECT NO.: P 1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
CLIENT NO.: 8400432736	
SPOOL NO.: 24809	DRAWING NO.: 1024910-WM-06C

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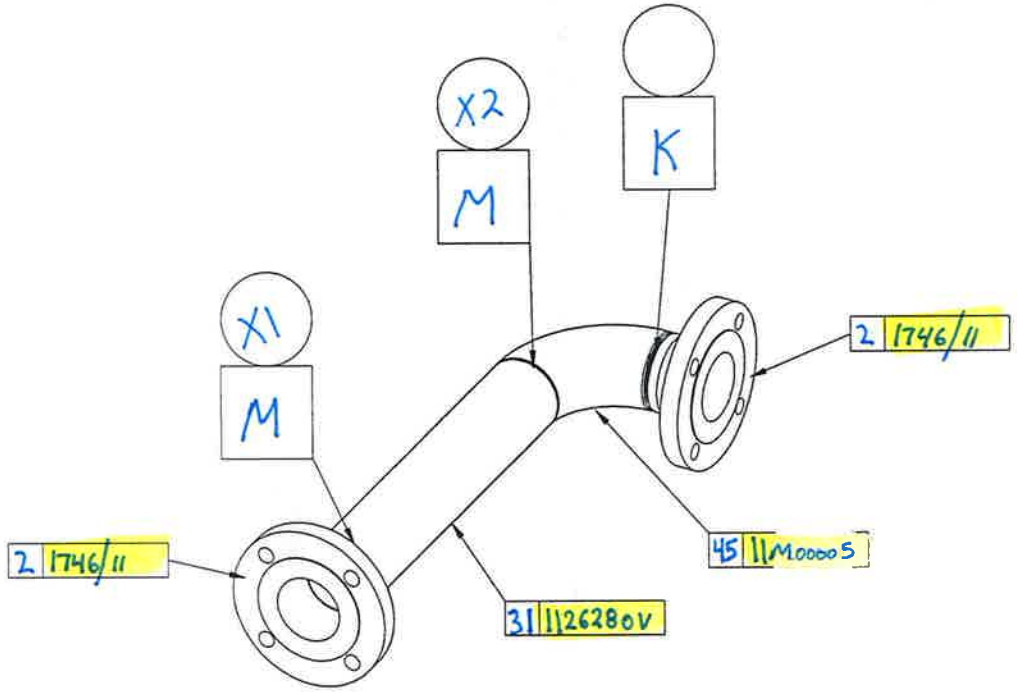

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MTR LOG # = = HEAT NUMBER

CSN 11441

PROJECT NO.: P1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
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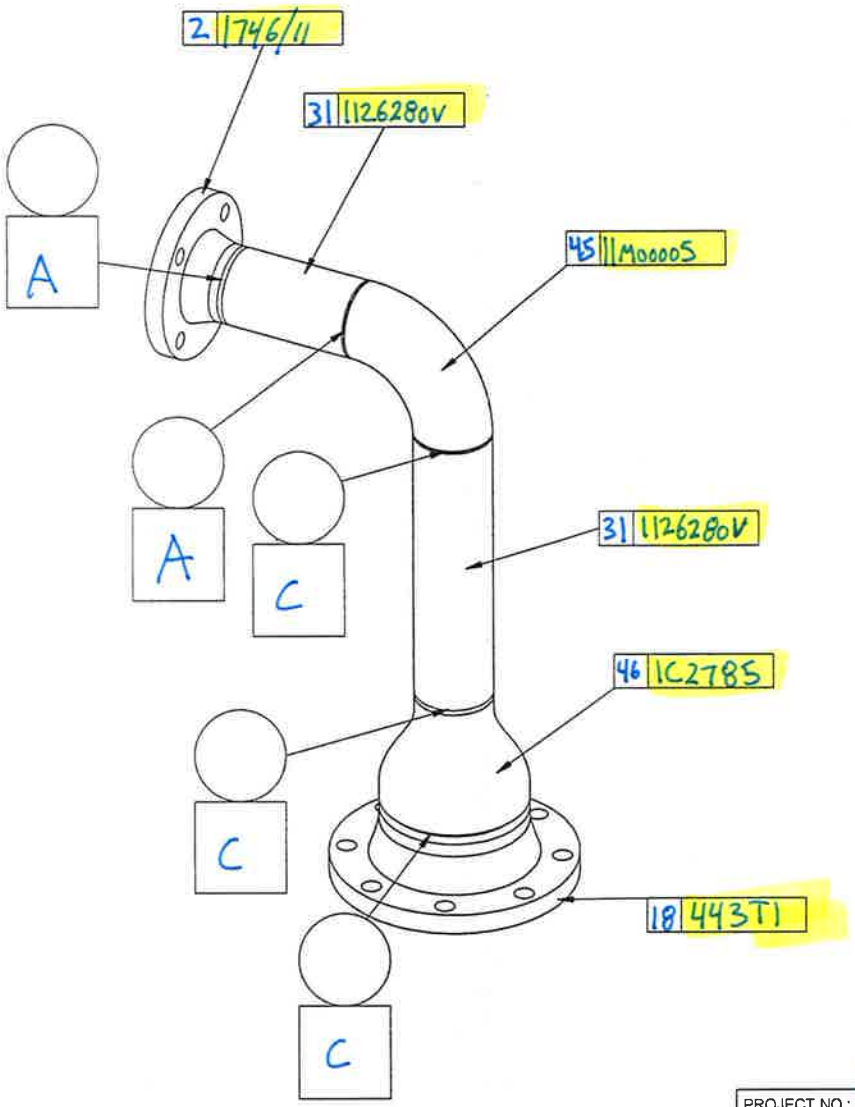

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MTR LOG # = [ ] = HEAT NUMBER

CSN 11441

PROJECT NO.: P1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
CLIENT NO.: 8400432736	
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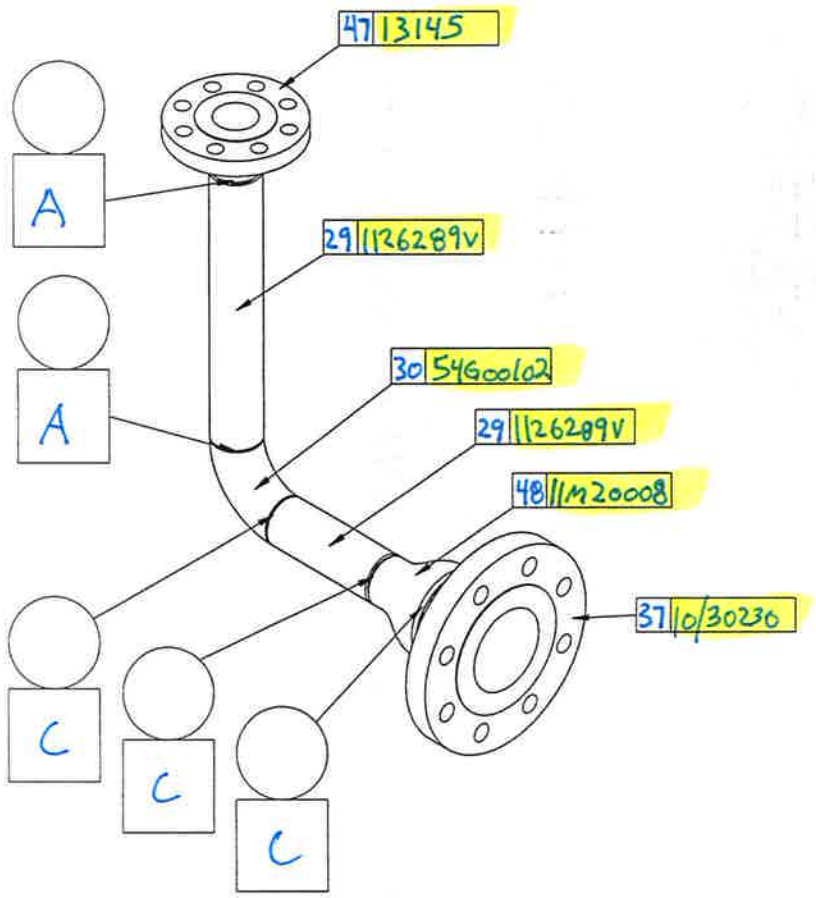

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MTR LOG # = [ ] = HEAT NUMBER

CSN 11441

PROJECT NO.: P1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
CLIENT NO.: 8400432736	
SPOOL NO.: 24776	DRAWING NO.: 1024910-WM-03A

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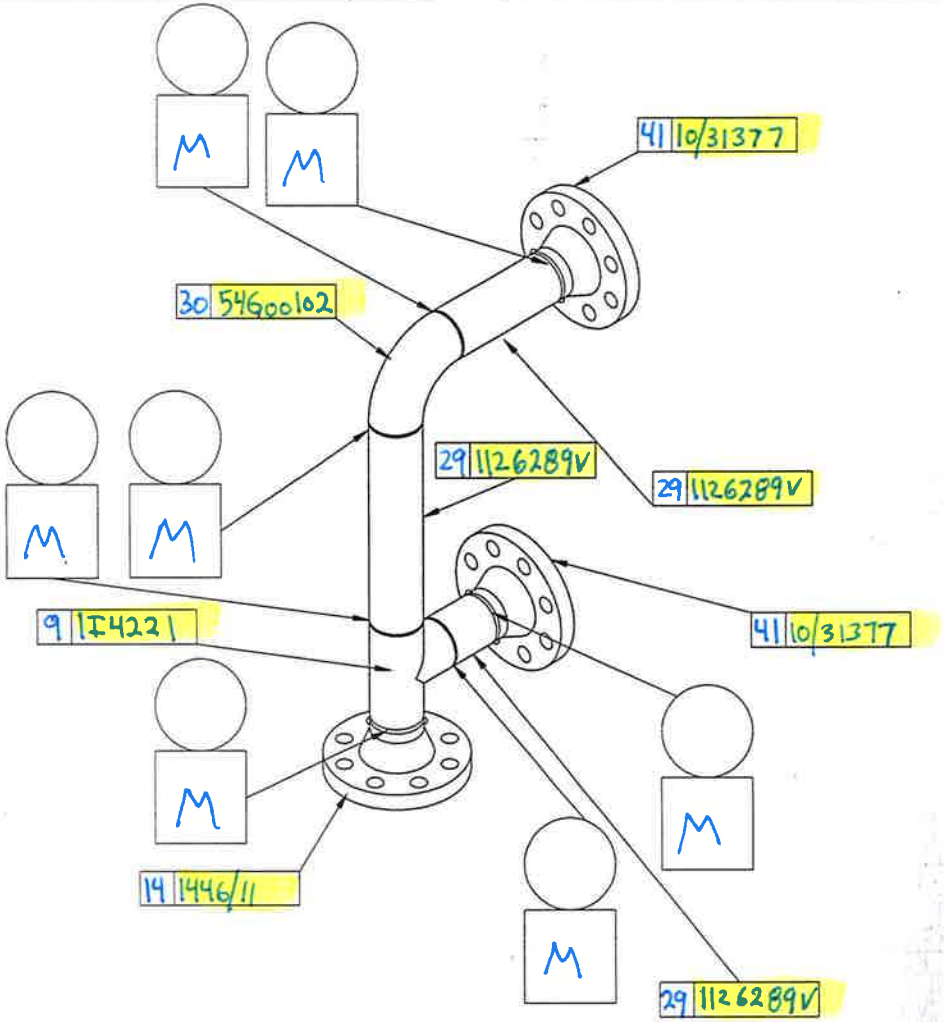

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CSN 11441

PROJECT NO.: P1378	CRIMTECH Services Ltd
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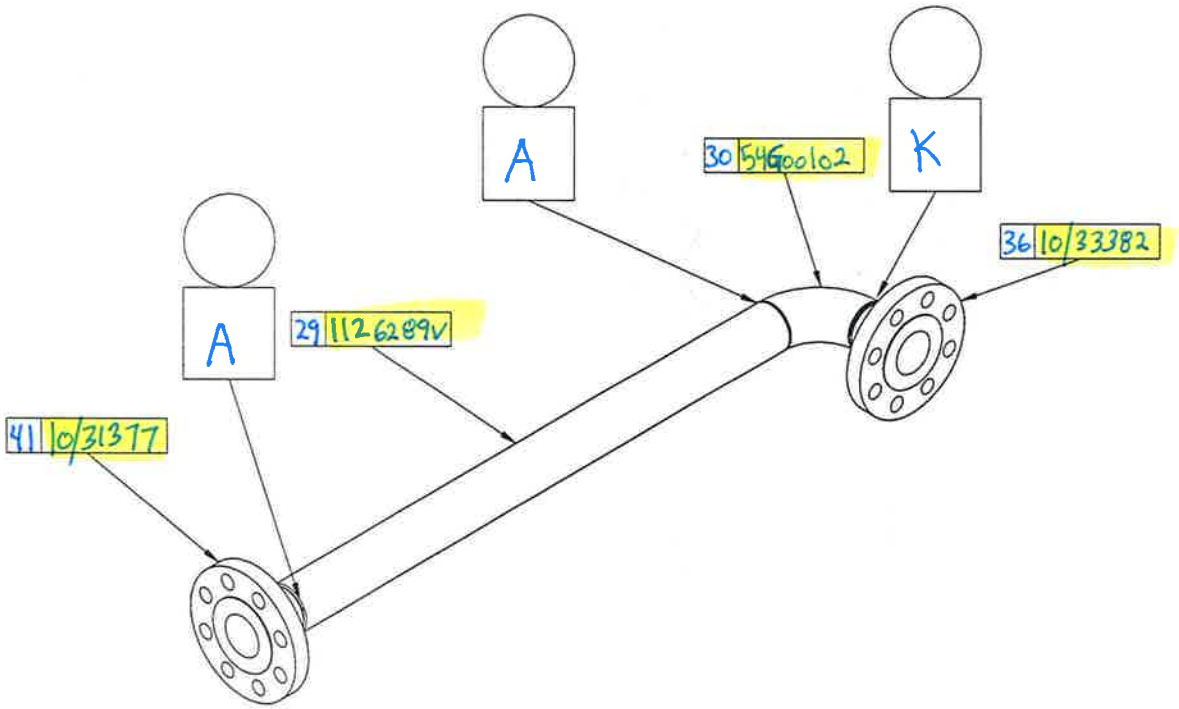
SPOOL NO.: 24786	DRAWING NO.: 1024910-WM-03B



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MTR LOG # = | | = HEAT NUMBER

CSN 11441

PROJECT NO.: P1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
CLIENT NO.: 8400432736	
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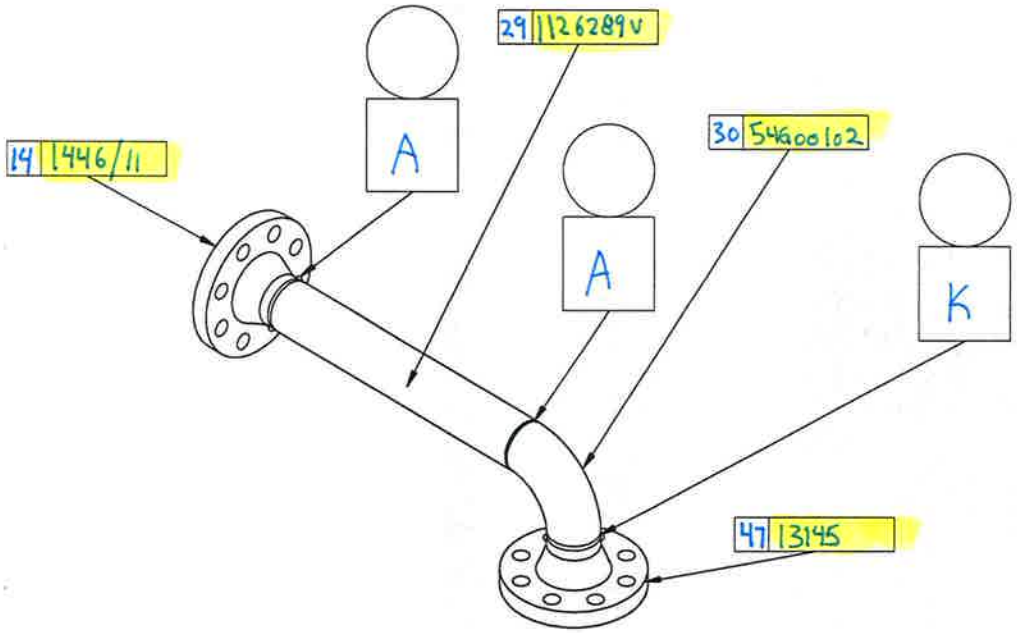

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MTR LOG # = = HEAT NUMBER

CSN 11441

PROJECT NO.: P1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
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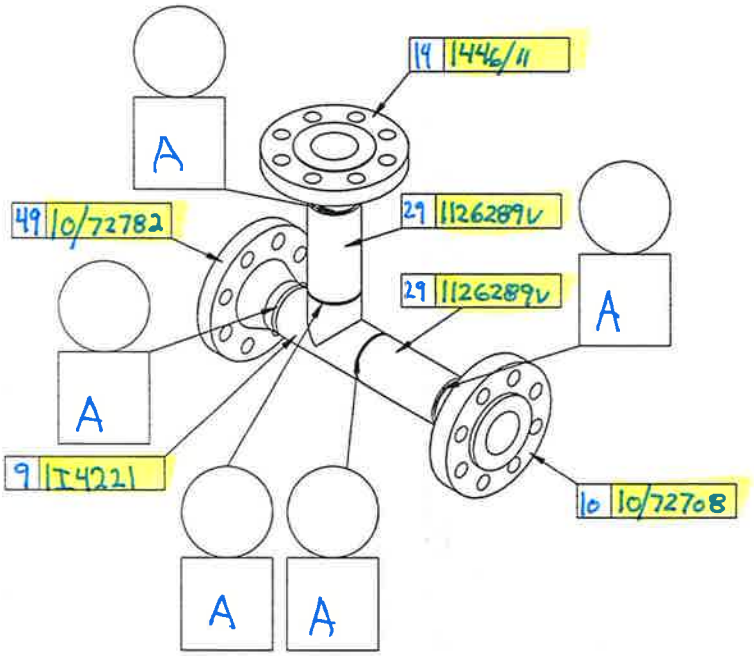

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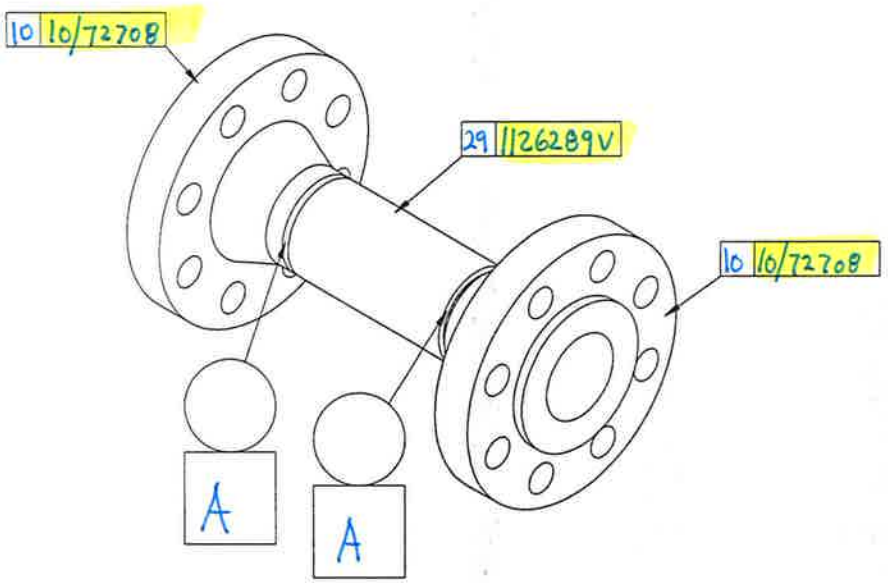
MTR LOG # = | | = HEAT NUMBER

CSN 11441

PROJECT NO.: P1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
CLIENT NO.: 8400432736	
SPOOL NO.: 24807	DRAWING NO.: 1024910-WM-06A



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MTR LOG # = | | = HEAT NUMBER

CSN 11441

PROJECT NO.: P1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
CLIENT NO.: 8400432736	
SPOOL NO.: 24781	DRAWING NO.: 1024910-WM-06B

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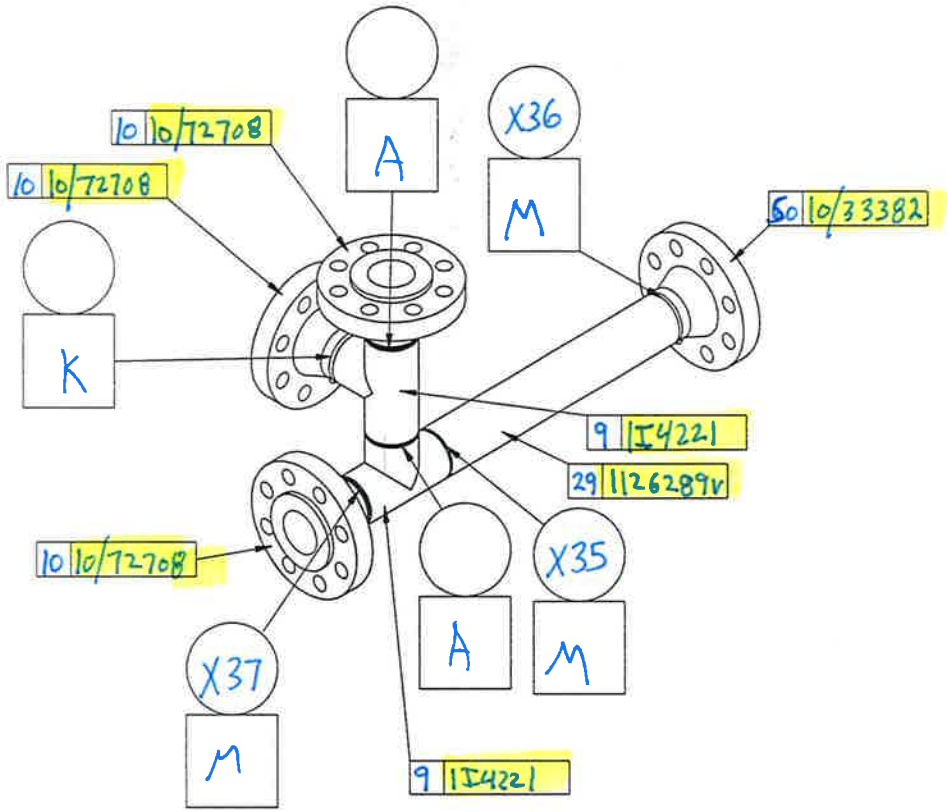

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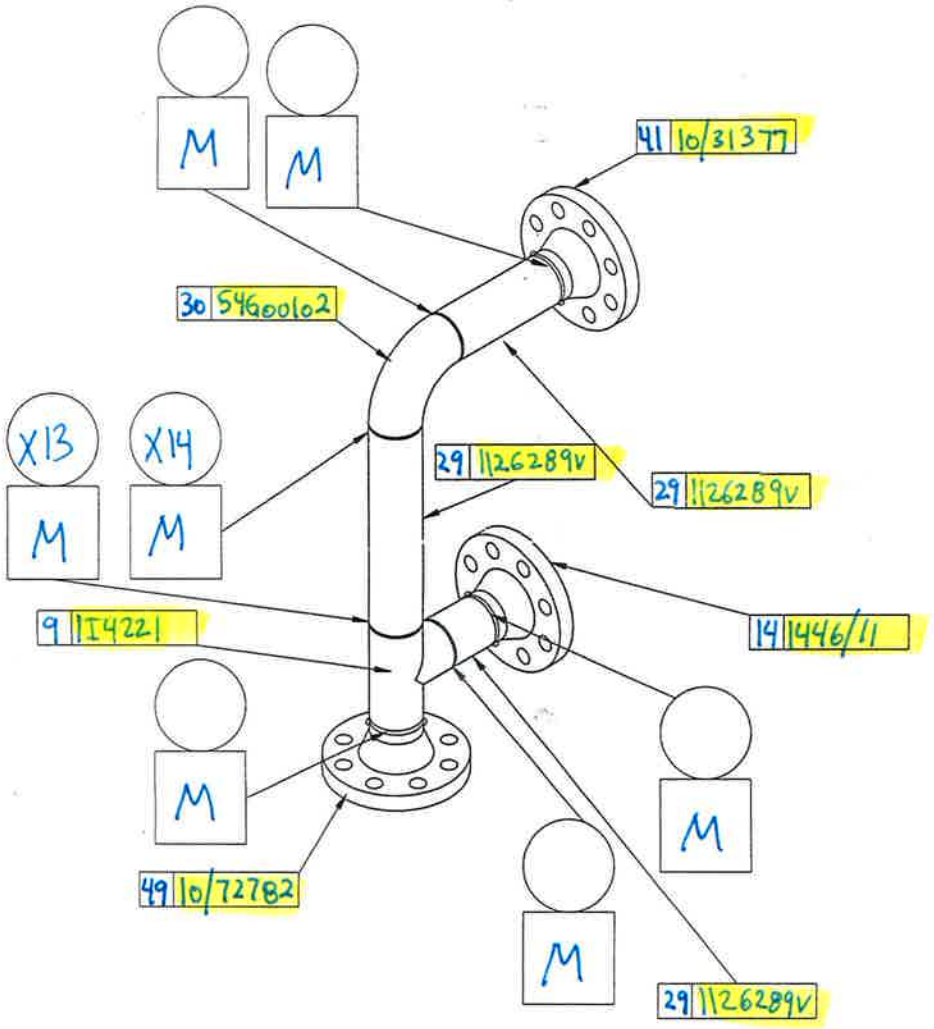
MTR LOG # = [ ] = HEAT NUMBER

CSN 11441

PROJECT NO.: P1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
CLIENT NO.: 8400432736	
SPOOL NO.: 24791	DRAWING NO.: 1024910-WM-06C

PRINTED: 2/8/2012 C:\PDM Working Files\1024910-WM-06C



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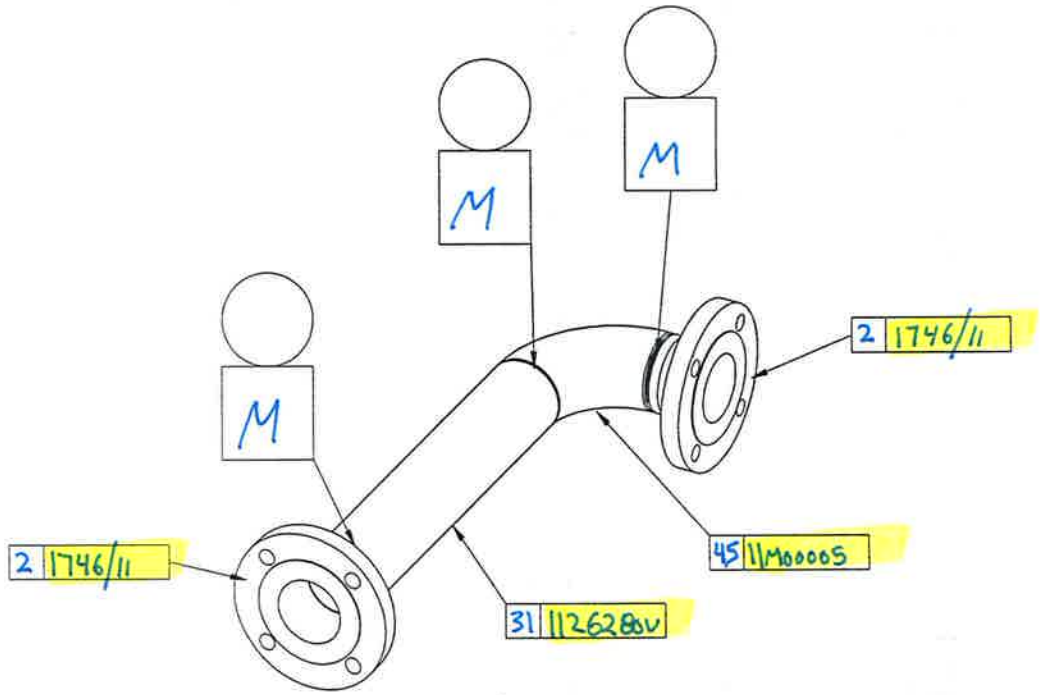
MTR LOG # = [ ] = HEAT NUMBER

CSN 11440

PROJECT NO.: P1378	CRIMTECH Services Ltd
CLIENT NO.: 8400432736	WWW.CRIMTECH.COM PH 1-800-993-9958
SPOOL NO.: 24768	DRAWING NO.: 1024910-WM-03B



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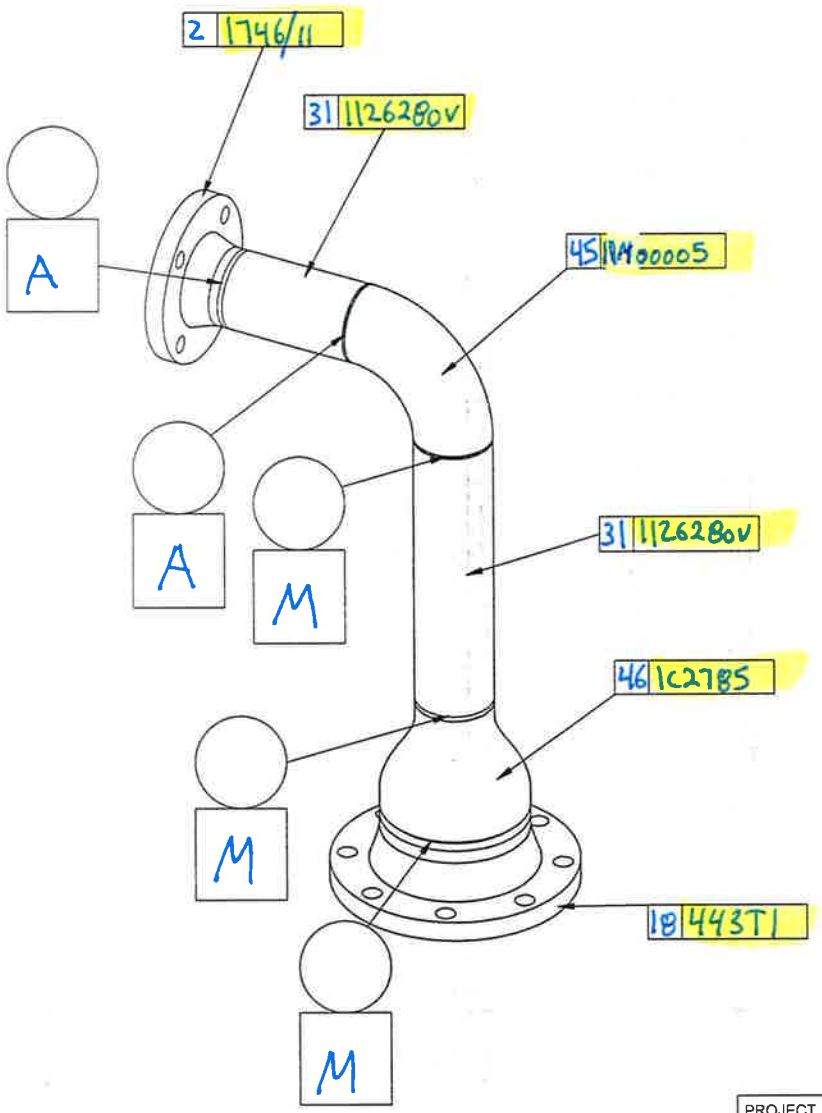
MTR LOG # = [ ] = HEAT NUMBER

CSN 11437

PROJECT NO.: P1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
CLIENT NO.: 8400432736	
SPOOL NO.: 24774	DRAWING NO.: 1024910-WM-01A



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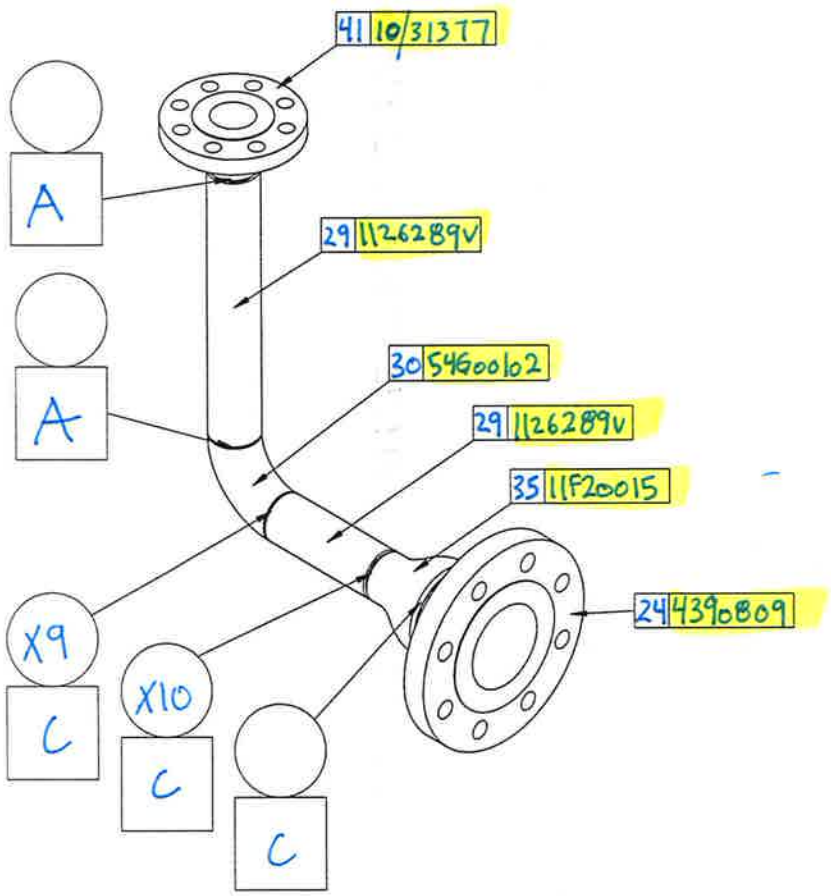
MTR LOG # = [ ] = HEAT NUMBER

CSN 11437

PROJECT NO.: P 1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
CLIENT NO.: 8400432736	
SPOOL NO.: 24793	DRAWING NO.: 1024910-WM-01B



WELD MAP LEGEND

= NDE

= WELDER

MTR LOG # = | | = HEAT NUMBER

CSN 11437

PROJECT NO.: P1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
CLIENT NO.: 8400432736	
SPOOL NO.: 24767	DRAWING NO.: 1024910-WM-03A

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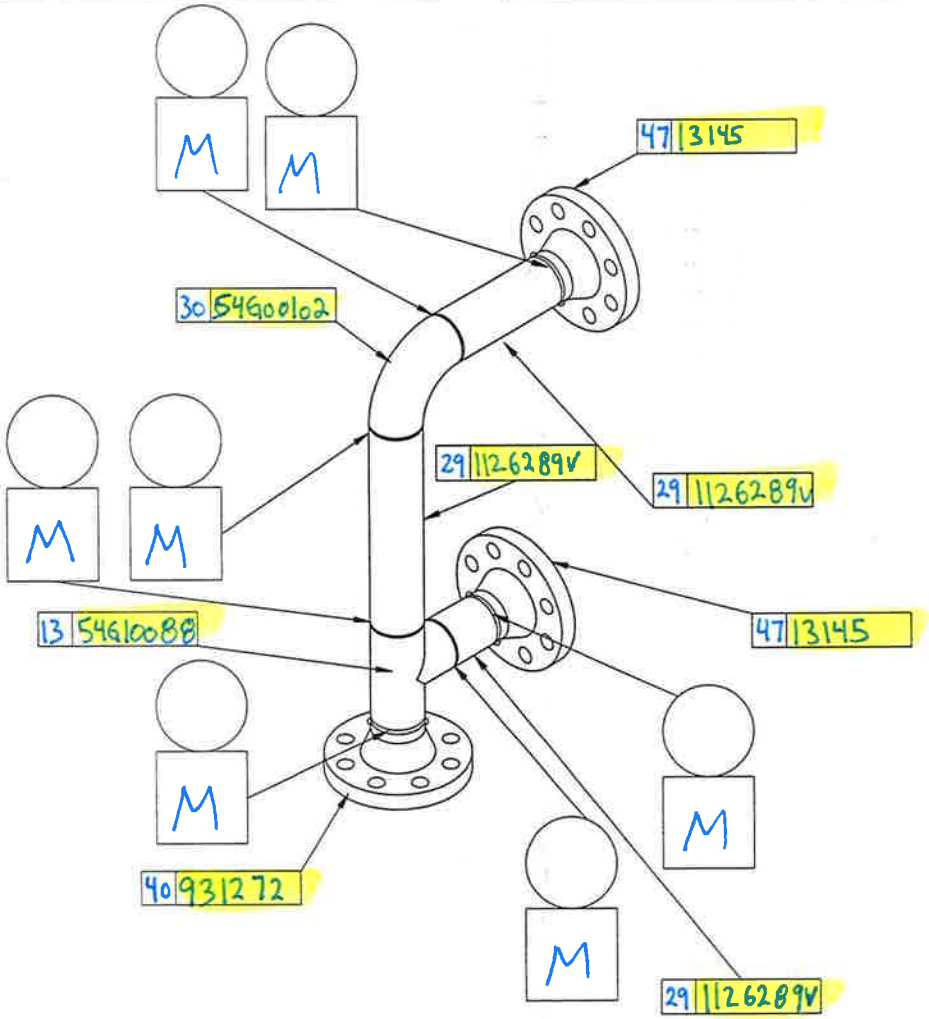

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MTR LOG # = [ ] = HEAT NUMBER

CSN 11437

PROJECT NO.: P1378	CRIMTECH Services Ltd
CLIENT NO.: 8400432736	WWW.CRIMTECH.COM PH 1-800-993-9958
SPOOL NO.: 24777	DRAWING NO.: 1024910-WM-03B

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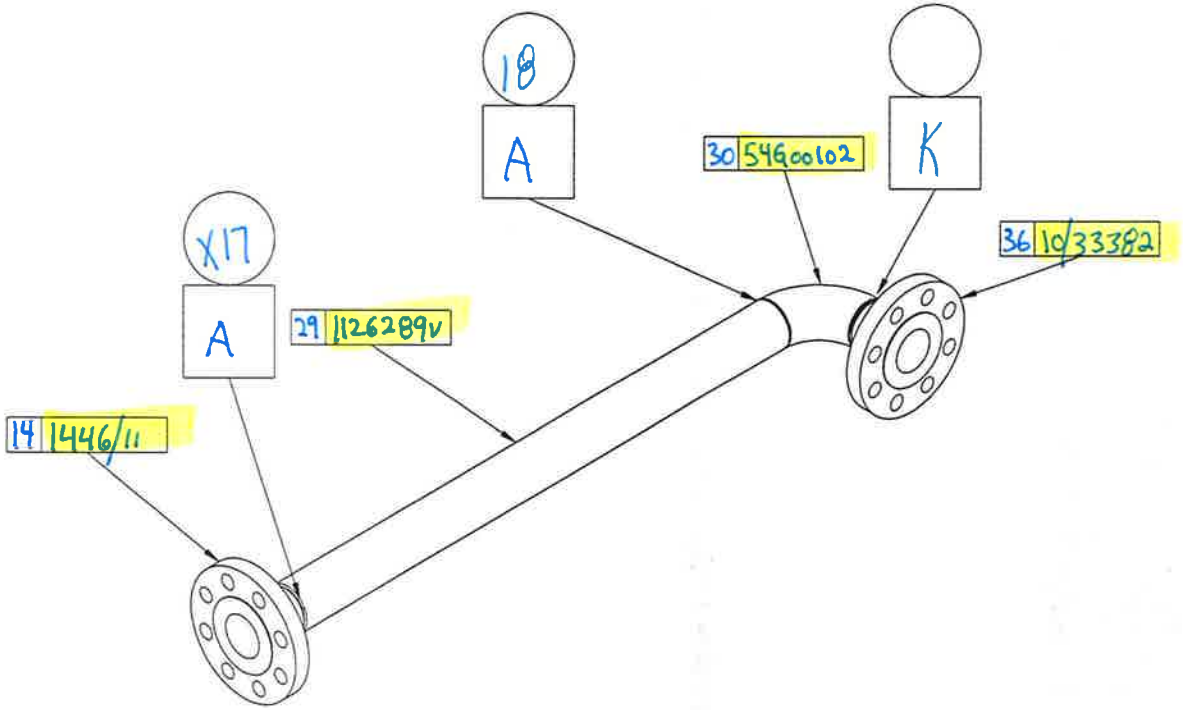

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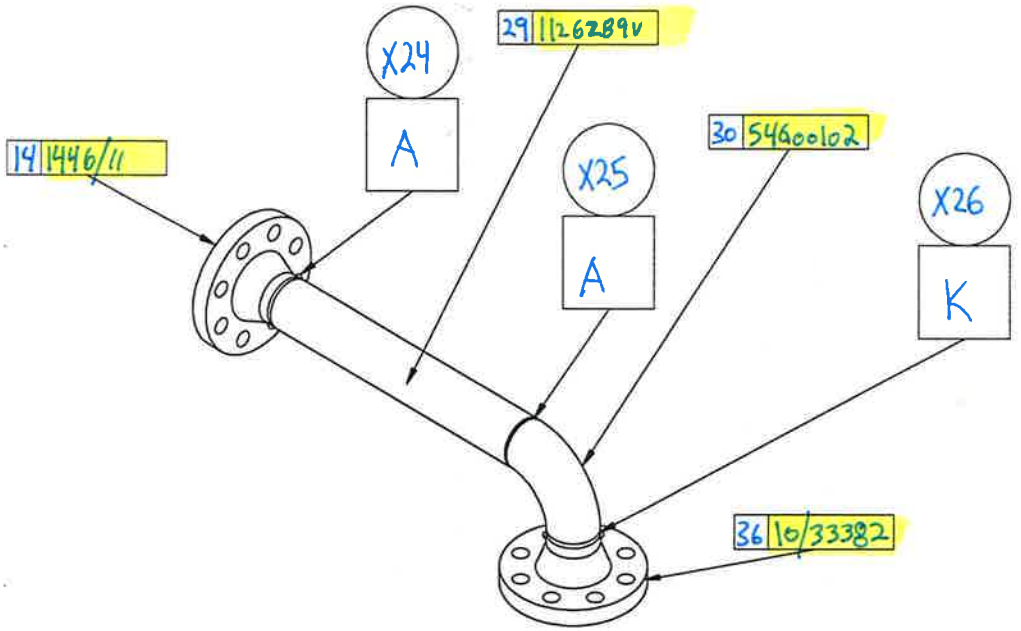
MTR LOG # = [ ] = HEAT NUMBER

CSN 11437

PROJECT NO.: P 1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
CLIENT NO.: 8400432736	
SPOOL NO.: 24769	DRAWING NO.: 1024910-WM-05A



WELD MAP LEGEND

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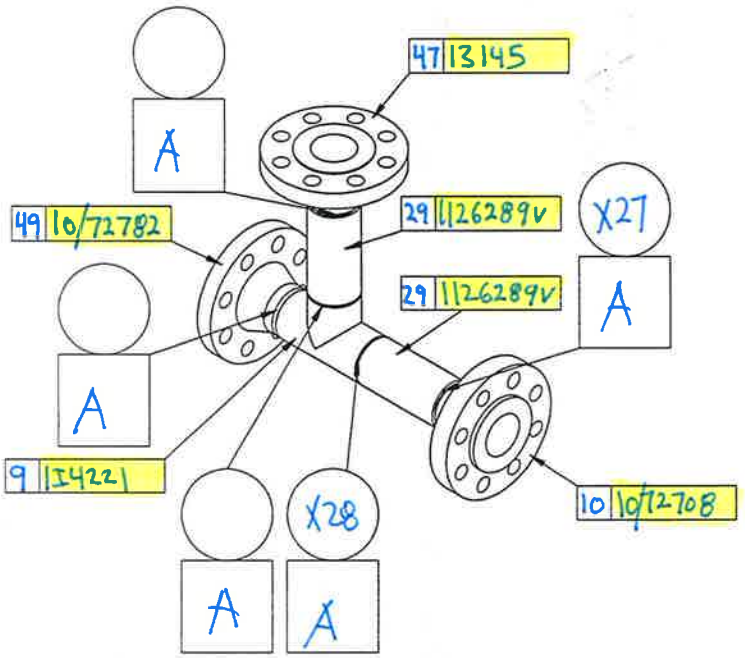
= WELDER

MTR LOG # = = HEAT NUMBER

CON 11437

PROJECT NO.: P1378	CRIMTECH Services Ltd
CLIENT NO.: 8400432736	WWW.CRIMTECH.COM PH 1-800-993-9958
SPOOL NO.: 24797	DRAWING NO.: 1024910-WM-05B



WELD MAP LEGEND

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= WELDER

MTR LOG # = | | = HEAT NUMBER

CSN 11437

PROJECT NO.: P 1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
CLIENT NO.: 8400432736	
SPOOL NO.: 24771	DRAWING NO.: 1024910-WM-06A

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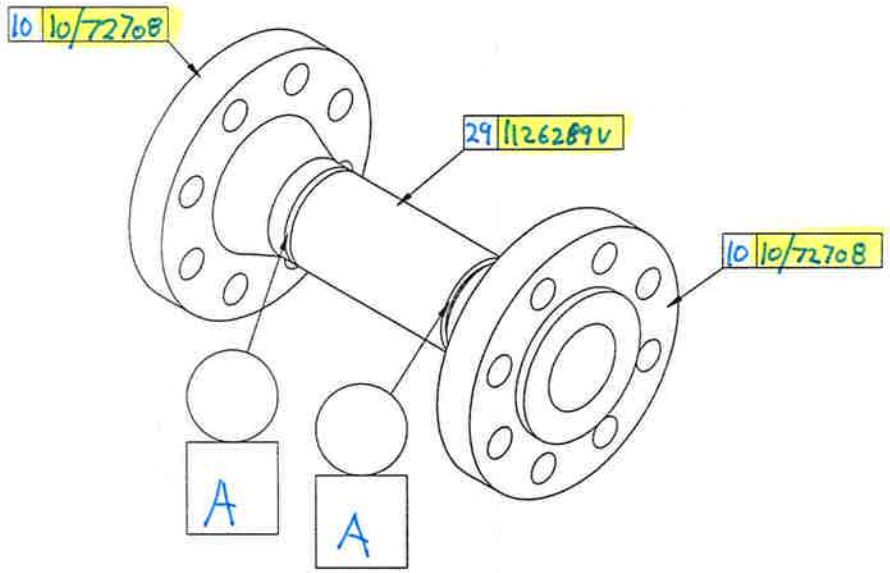

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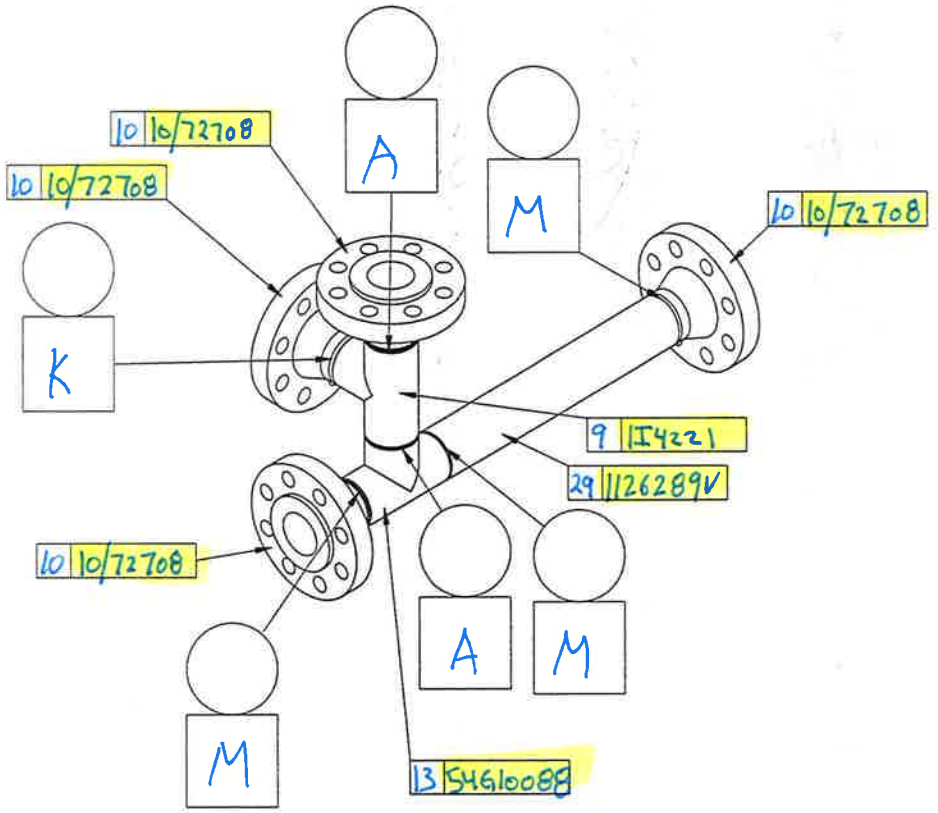
= WELDER

MTR LOG # = = HEAT NUMBER

CSN 11437

PROJECT NO.: P 1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
CLIENT NO.: 8400432736	
SPOOL NO.: 24772	DRAWING NO.: 1024910-WM-06B

PRINTED: 2/8/2012 C:\PDM Working Files\1024910-WM-06B



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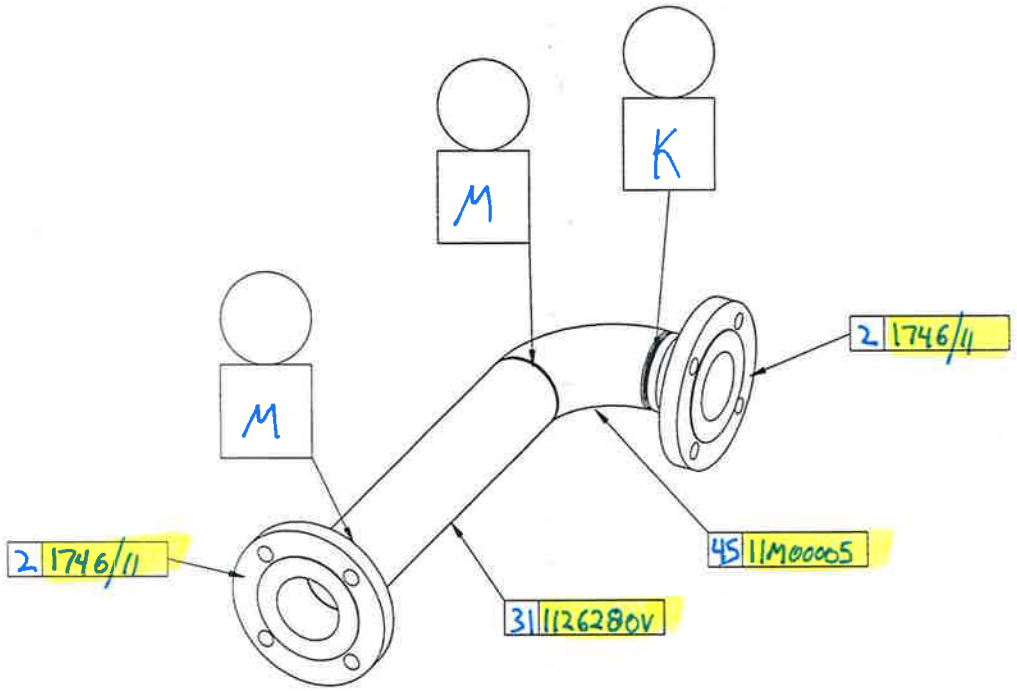
= WELDER

MTR LOG # = [ ] = HEAT NUMBER

CSN 11437

PROJECT NO.: P1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
CLIENT NO.: 8400432736	
SPOOL NO.: 24782	DRAWING NO.: 1024910-WM-06C

PRINTED: 2/8/2012 C:\PDM Working Files\1024910-WM-06C



WELD MAP LEGEND

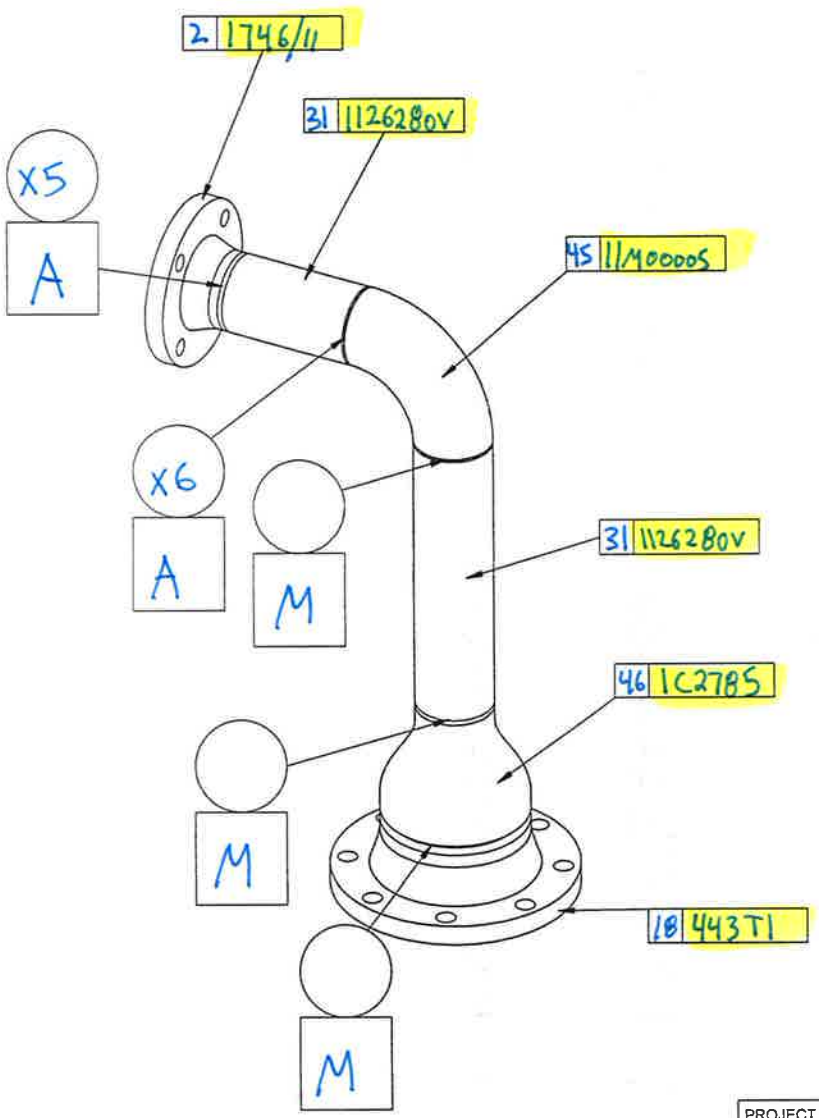
= NDE

= WELDER

MTR LOG # = [ ] = HEAT NUMBER

CSN 11438

PROJECT NO.: P1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
CLIENT NO.: 8400432736	
SPOOL NO.: 24801	DRAWING NO.: 1024910-WM-01A



WELD MAP LEGEND

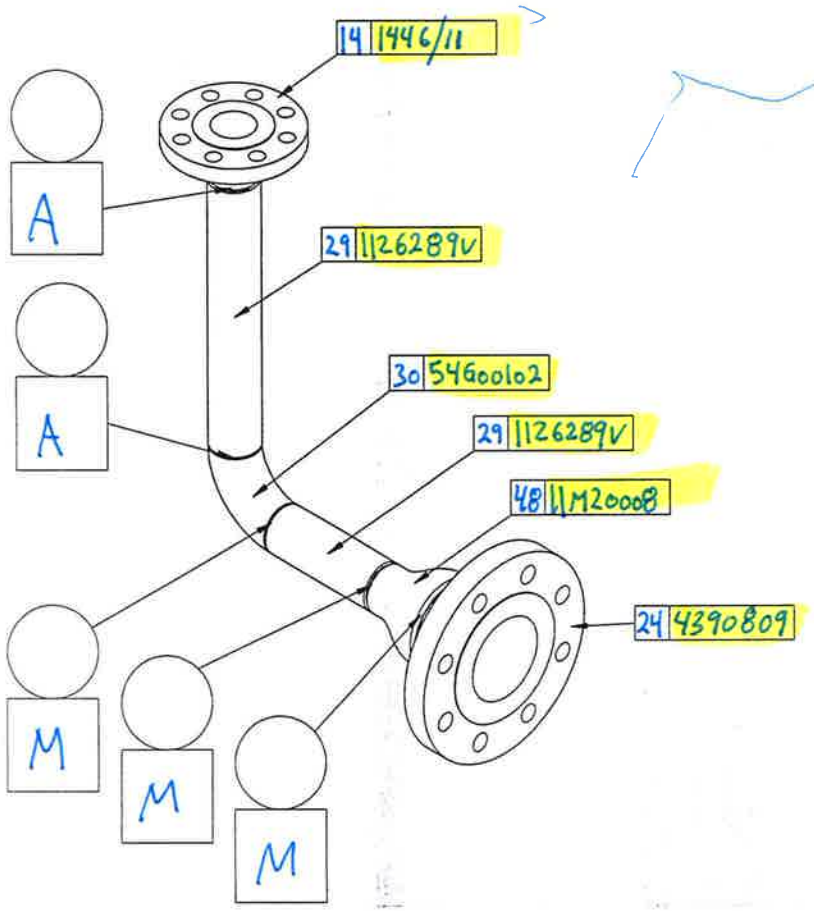
= NDE

= WELDER

MTR LOG # = [ ] = HEAT NUMBER

CSN 11438

PROJECT NO.: P1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
CLIENT NO.: 8400432736	
SPOOL NO.: 24775	DRAWING NO.: 1024910-WM-01B



WELD MAP LEGEND

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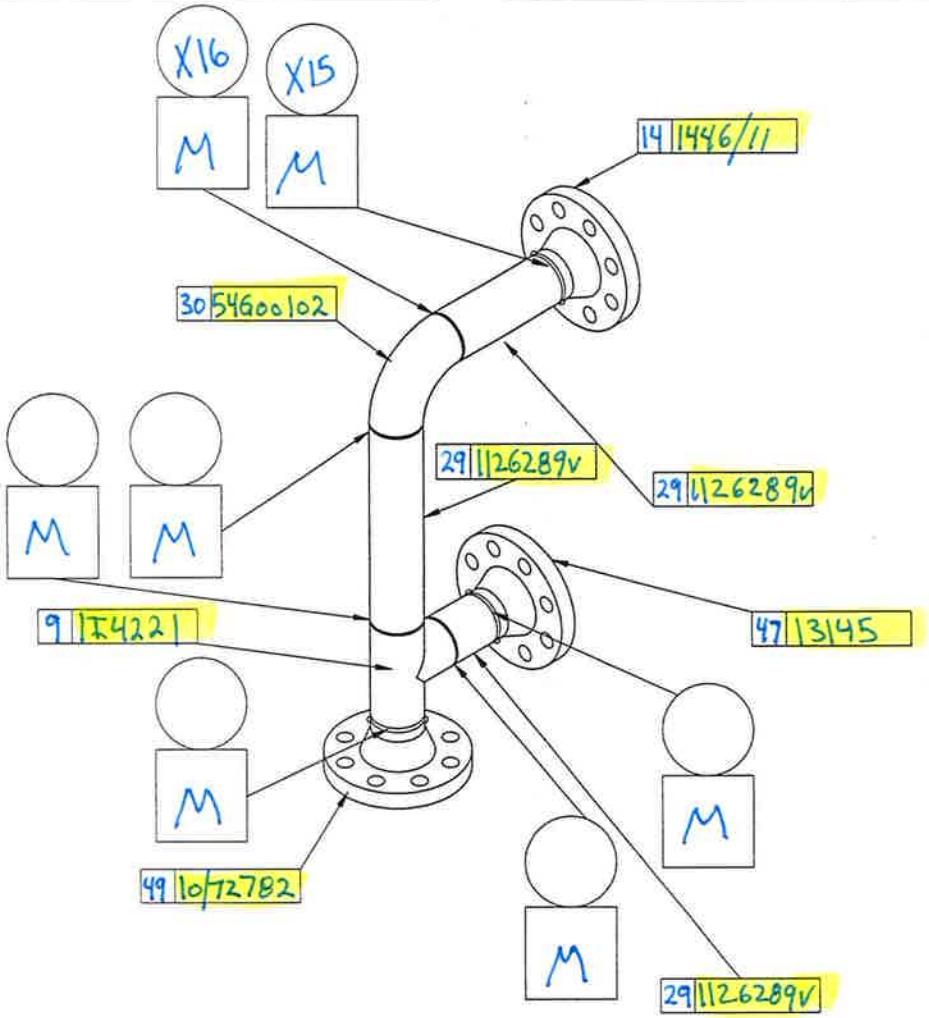
= WELDER

MTR LOG # = | | = HEAT NUMBER

CSN 11438

PROJECT NO.: P 1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
CLIENT NO.: 8400432736	
SPOOL NO.: 24803	DRAWING NO.: 1024910-WM-03A



WELD MAP LEGEND

= NDE

= WELDER

MTR LOG # = | | = HEAT NUMBER

CSN 11438

PROJECT NO.: P 1378	CRIMTECH Services Ltd
CLIENT NO.: 8400432736	WWW.CRIMTECH.COM PH 1-800-993-9958
SPOOL NO.: 24795	DRAWING NO.: 1024910-WM-03B

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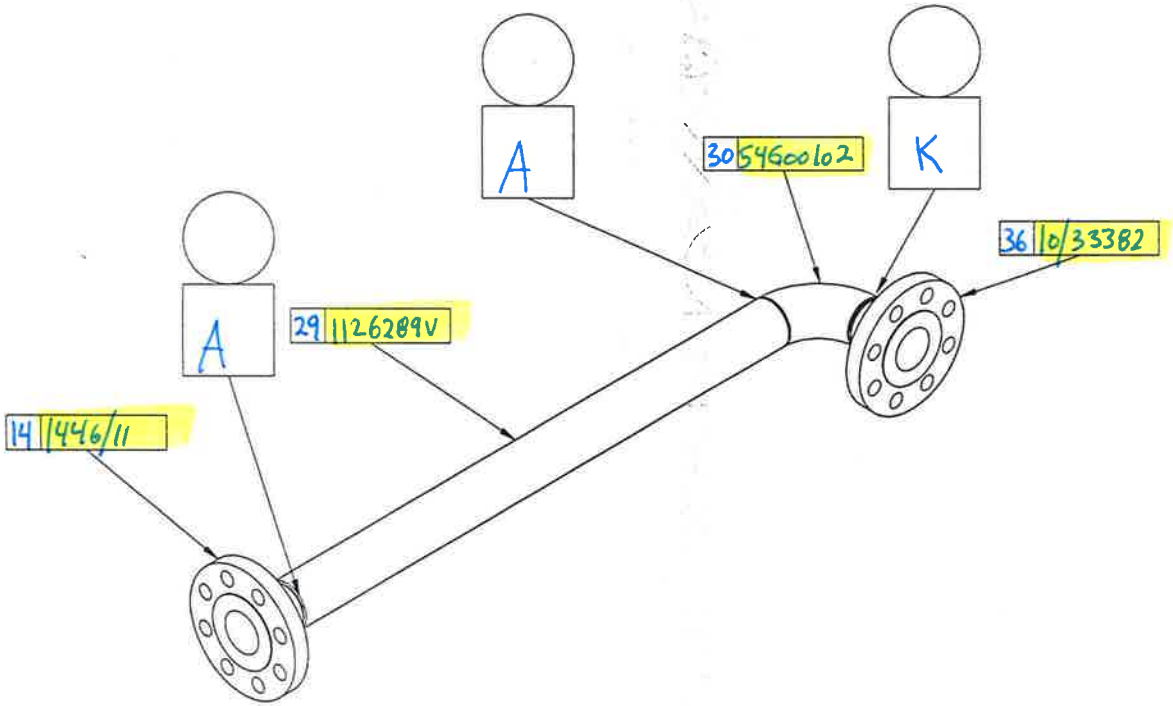


WELD MAP LEGEND

= NDE

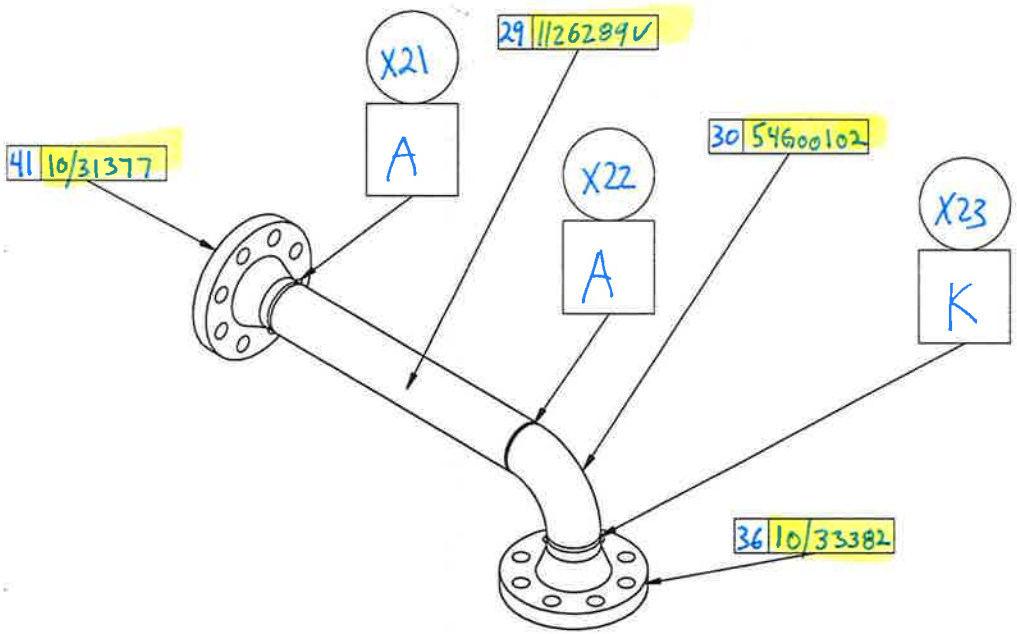
= WELDER

MTR LOG # = = HEAT NUMBER

CSN 11438

PROJECT NO.: P 1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
CLIENT NO.: 84004327.36	
SPOOL NO.: 24796	DRAWING NO.: 1024910-WM-05A

PRINTED: 2/8/2012 C:\PDM Working Files\1024910-WM-05A



WELD MAP LEGEND

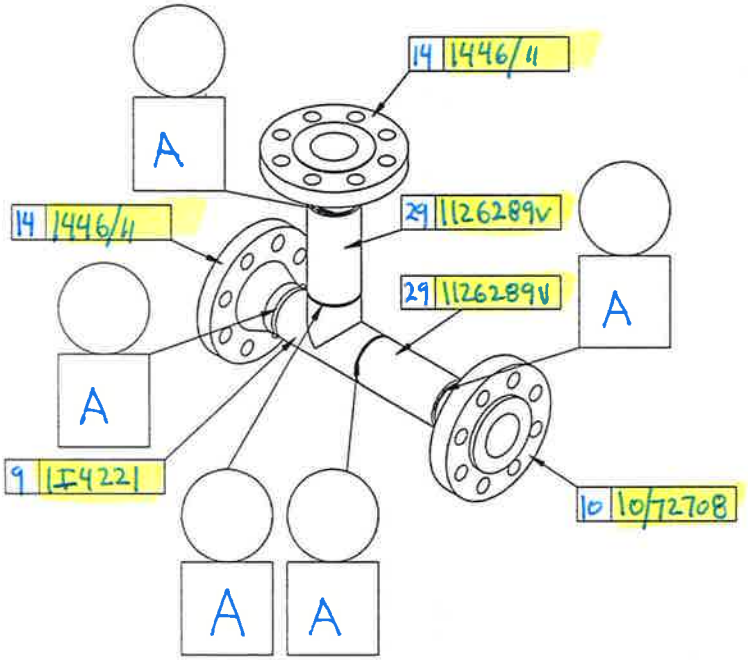
= NDE

= WELDER

MTR LOG # = = HEAT NUMBER

CSN 11438

PROJECT NO.: P1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
CLIENT NO.: 8400432736	
SPOOL NO.: 24779	DRAWING NO.: 1024910-WM-05B



WELD MAP LEGEND

= NDE

= WELDER

MTR LOG # = = HEAT NUMBER

CSN 11438

PROJECT NO.: P1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
CLIENT NO.: 8400432736	
SPOOL NO.: 24798	DRAWING NO.: 1024910-WM-06A

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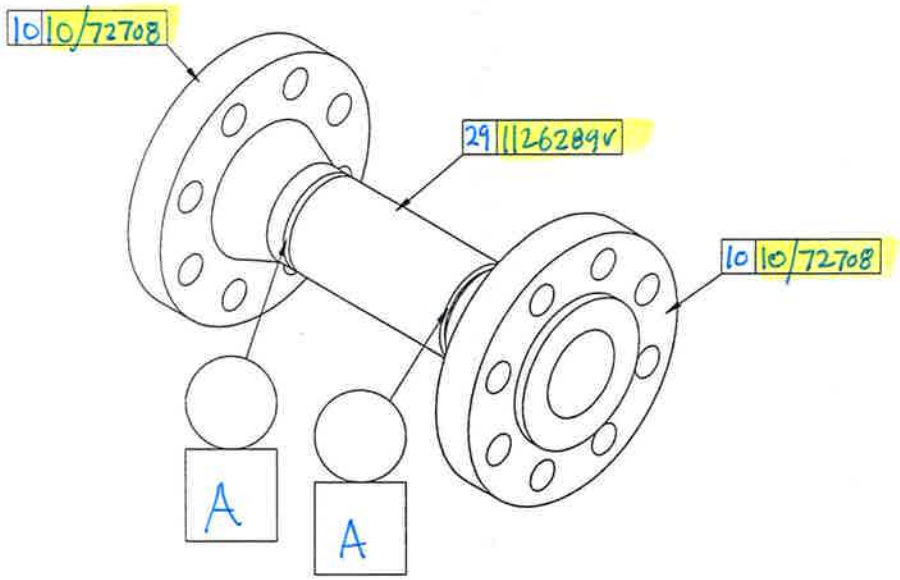

WELD MAP LEGEND

= NDE

= WELDER

MTR LOG # = [ ] = HEAT NUMBER

CSN 11438

PROJECT NO.: P1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
CLIENT NO.: 8400432736	
SPOOL NO.: 24799	DRAWING NO.: 1024910-WM-06B

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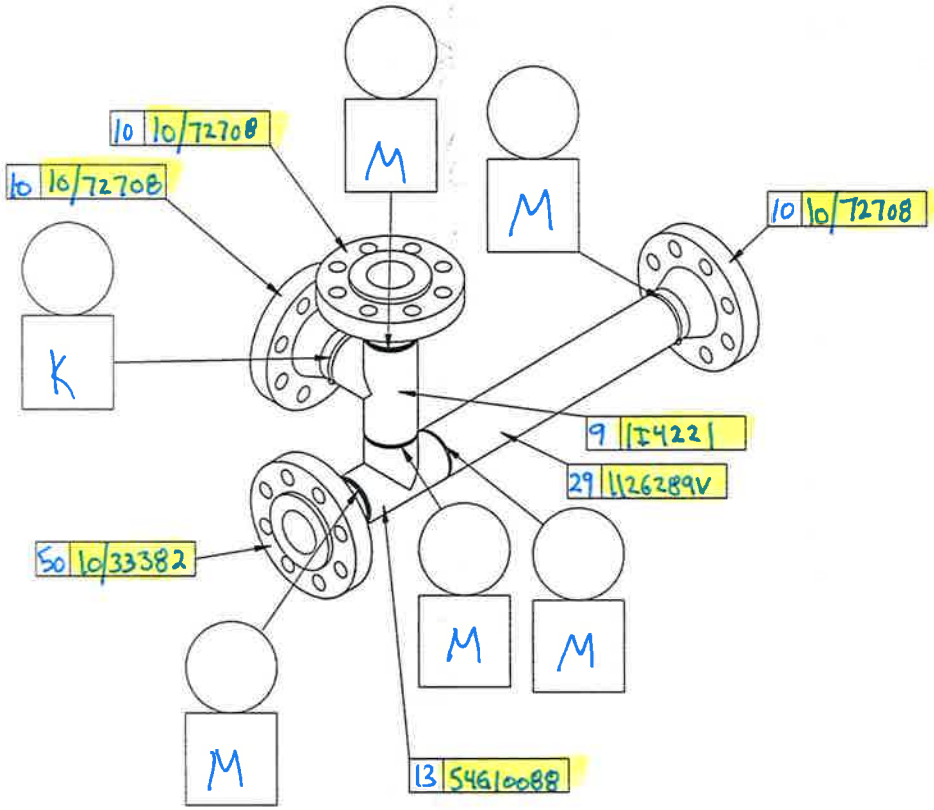


WELD MAP LEGEND

= NDE

= WELDER

MTR LOG # = | | = HEAT NUMBER

CSN 11438

PROJECT NO.: P1378	CRIMTECH Services Ltd WWW.CRIMTECH.COM PH 1-800-993-9958
CLIENT NO.: 8400432736	
SPOOL NO.: 24800	DRAWING NO.: 1024910-WM-06C

PRINTED: 2/8/2012 C:\PDM Working Files\1024910-WM-06C

PRODUCTS DIVISION
Quality Control Department
Hydrostatic Test Report

CRIMTECH Services Ltd

Client: Husky		Project No.: P1378-4	
Project Description: Water transfer Skid		Test Date: April 17, 2012	
Test Location: Crimtech Shop	Vessel S/N: N/A	Package CSN: 11437 to 11441	
Number of Spools in Hydro:	10	Number of Spools Recorded:	10

Piping Spool S/N's:
24775; 24743; 24765; 24774; 24783; 24792; 24802; 24706
24801; 24784

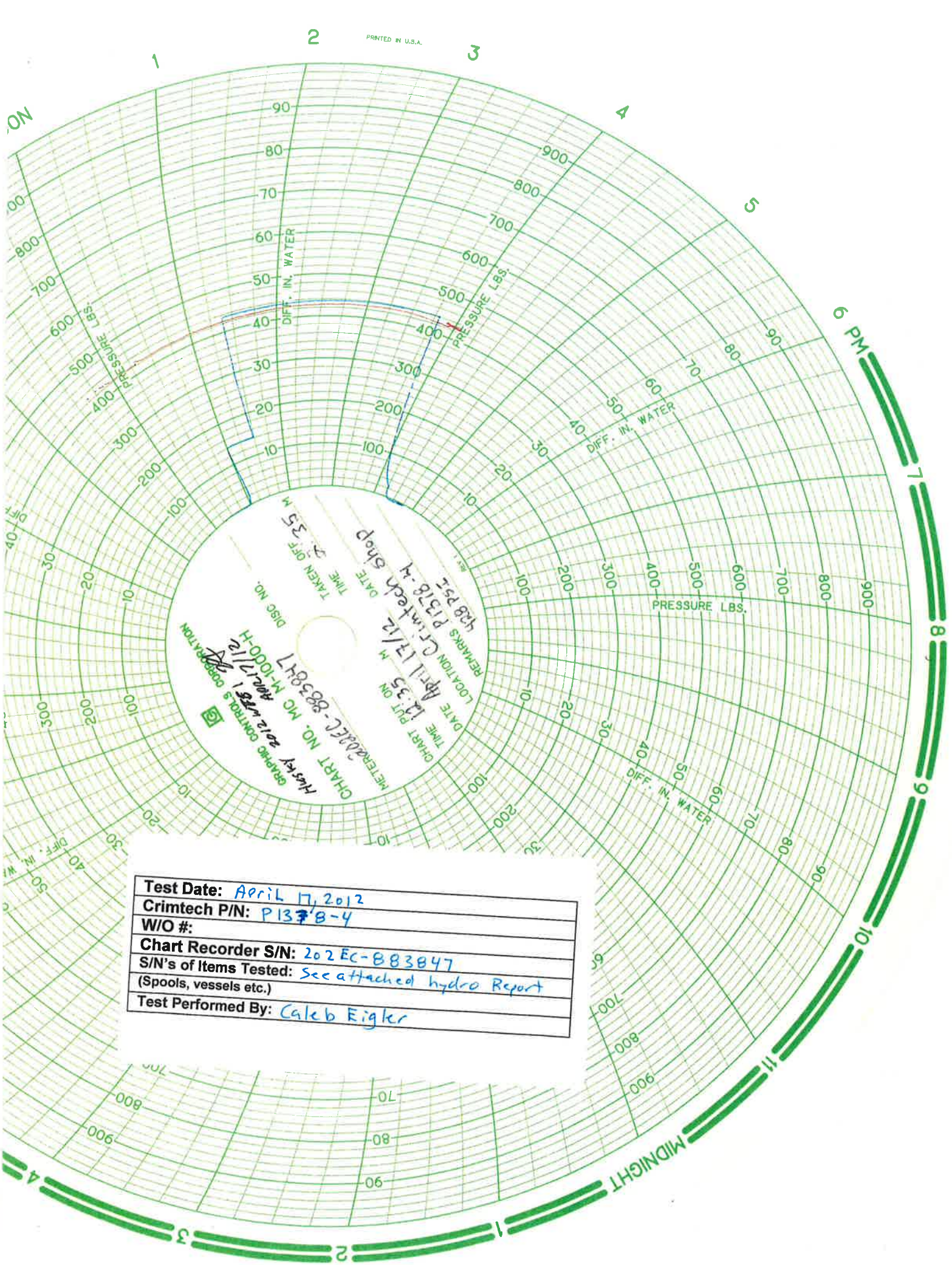
Pressure Test Preparation	Shop (Initials)	QC (Initials)
Area secured, flagged off, signs up, barracades & safety cages considered	CE.	KG
Does the client have their own pressure test specifications to follow (ie. gauge calibration dates 6 or 12 months, dead weight gauge required)	CE.	KG
Test pressure matches drawings (pressure gauges to be between 1.5 and 4 times the test pressure)	CE.	KG
Hydrotest equipment calibration verified	CE.	KG
Hoses, fittings, gauges suitable for test pressure and in good repair	CE.	KG
All items which could be damaged by test isolated or removed (control valves, safety valves, instruments, lower pressure piping, vessels)	CE.	KG
Equipment with internals that could be damaged, isolated or removed	CE.	KG
All air bled out and fluid temperature stabilized	CE.	KG
Valves opened halfway	CE.	KG

Test Conducted By: Caleb Eigler — Test Medium: Water
Test Gauge No's: 32595, 646472-1-1 — Chart Recorder No.: 202EC-883847
Test Pressure: 428 ☑ PSI ☐ kPa — Holding Time at Test Pressure: (Minimum 15 minutes) 1 hour
Test Results:
held pressure and no leaks

Hydrostatic Test Verification: Pressure Test Code: ☐ ASME ☒ CSA ☐ ATMS

☐ N/A	K. Funnytus (Client Representative Name)	(Signature)	Date:	04 Mo	17 Day	12 Yr
☐ N/A	Kelly Gates (Crimtech QC Inspector Name)	Kelly Gates (Signature)	Date:	4 Mo	17 Day	12 Yr
☒ N/A	(Authorized Inspector Name)	(Signature)	Date:	Mo	Day	Yr

Comments:



Test Date:	April 17, 2012
Crimtech P/N:	P1378-4
W/O #:	
Chart Recorder S/N:	202EC-883847
S/N's of Items Tested: (Spools, vessels etc.)	See attached hydro Report
Test Performed By:	Caleb Eigler

PRODUCTS DIVISION
Quality Control Department
Hydrostatic Test Report

CRIMTECH Services Ltd

Client: Husky		Project No.: P1378-4	
Project Description: Water transfer Skid		Test Date: April 17, 2012	
Test Location: Crimtech Shop	Vessel S/N: N/A	Package CSN: 11437 to 11441	
Number of Spools in Hydro: 25		Number of Spools Recorded:	25

Piping Spool S/N's:

· 24779 ; 24789 ; 24807 ; 24806 ; 24787 ; 24788 ; 24770 ; 24778
· 24780 , 24798 , 24768 ; 24777 ; 24804 ; 24786 ; 24795 ; 24796 ,
· 24797 , 24767 , 24785 ; 24794 ; 24805 ; 24771 ; 24769 ; 24776
· 24803

Pressure Test Preparation	Shop (Initials)	QC (Initials)
Area secured, flagged off, signs up, barracades & safety cages considered	CE.	KG
Does the client have their own pressure test specifications to follow (ie. gauge calibration dates 6 or 12 months, dead weight gauge required)	CE.	KG
Test pressure matches drawings (pressure gauges to be between 1.5 and 4 times the test pressure)	CE.	KG
Hydrotest equipment calibration verified	CE.	KG
Hoses, fittings, gauges suitable for test pressure and in good repair	CE.	KG
All items which could be damaged by test isolated or removed (control valves, safety valves, instruments, lower pressure piping, vessels)	CE.	KG
Equipment with internals that could be damaged, isolated or removed	CE.	KG
All air bled out and fluid temperature stabilized	CE.	KG
Valves opened halfway	CE.	KG

Test Conducted By: Caleb Eigler — Test Medium: Water

Test Gauge No's: CT003 , 547239 — Chart Recorder No.: 202E-160920

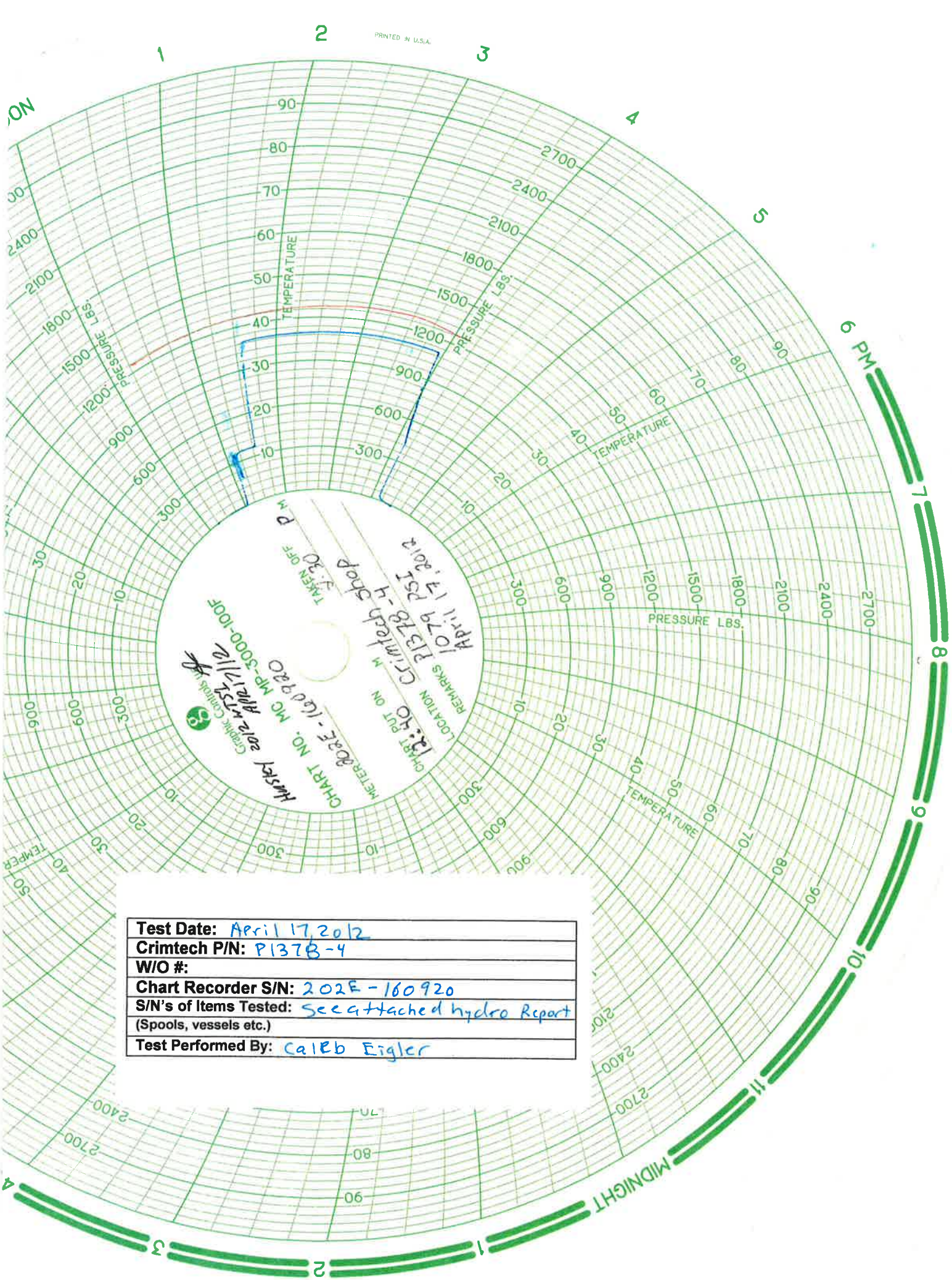
Test Pressure: 1079 (min) ☑ PSI ☐ kPa — Holding Time at Test Pressure: (Minimum 15 minutes) 1 hours

Test Results:
held pressure and no leaks

Hydrostatic Test Verification: Pressure Test Code: ☐ ASME ☒ CSA ☐ ATMS

☐ N/A	K. Fundytus (Client Representative Name)	(Signature)	Date:	04 Mo	17 Day	12 Yr
☐ N/A	Kelly Gates (Crimtech QC Inspector Name)	Kelly Gates (Signature)	Date:	4 Mo	17 Day	12 Yr
☒ N/A	(Authorized Inspector Name)	(Signature)	Date:	Mo	Day	Yr

Comments:



Test Date:	April 17, 2012
Crimtech P/N:	P137B-4
W/O #:	
Chart Recorder S/N:	202E-160920
S/N's of Items Tested:	See attached Hydro Report
(Spools, vessels etc.)	
Test Performed By:	Caleb Eigler

PRODUCTS DIVISION
Quality Control Department
Hydrostatic Test Report

CRIMTECH Services Ltd

Client: Husky		Project No.: P1378-4	
Project Description: Water transfer skid		Test Date: April, 17, 2012	
Test Location: Crimtech Shop	Vessel S/N:	Package CSN: 11437 to 11491	
Number of Spools in Hydro:	10	Number of Spools Recorded:	10

Piping Spool S/N's:

24808, 24791, 24800, 24773, 24809, 24781, 24782, 24799
24772, 24790

Pressure Test Preparation	Shop (Initials)	QC (Initials)
Area secured, flagged off, signs up, barracades & safety cages considered	CE.	KG
Does the client have their own pressure test specifications to follow (ie. gauge calibration dates 6 or 12 months, dead weight gauge required)	CE.	KG
Test pressure matches drawings (pressure gauges to be between 1.5 and 4 times the test pressure)	CE.	KG
Hydrotest equipment calibration verified	CE.	KG
Hoses, fittings, gauges suitable for test pressure and in good repair	CE.	KG
All items which could be damaged by test isolated or removed (control valves, safety valves, instruments, lower pressure piping, vessels)	CE.	KG
Equipment with internals that could be damaged, isolated or removed	CE.	KG
All air bled out and fluid temperature stabilized	CE.	KG
Valves opened halfway	CE.	KG

Test Conducted By: Caleb Eigler — Test Medium: Water

Test Gauge No's: CT006, 545730 — Chart Recorder No.: 202E-032838

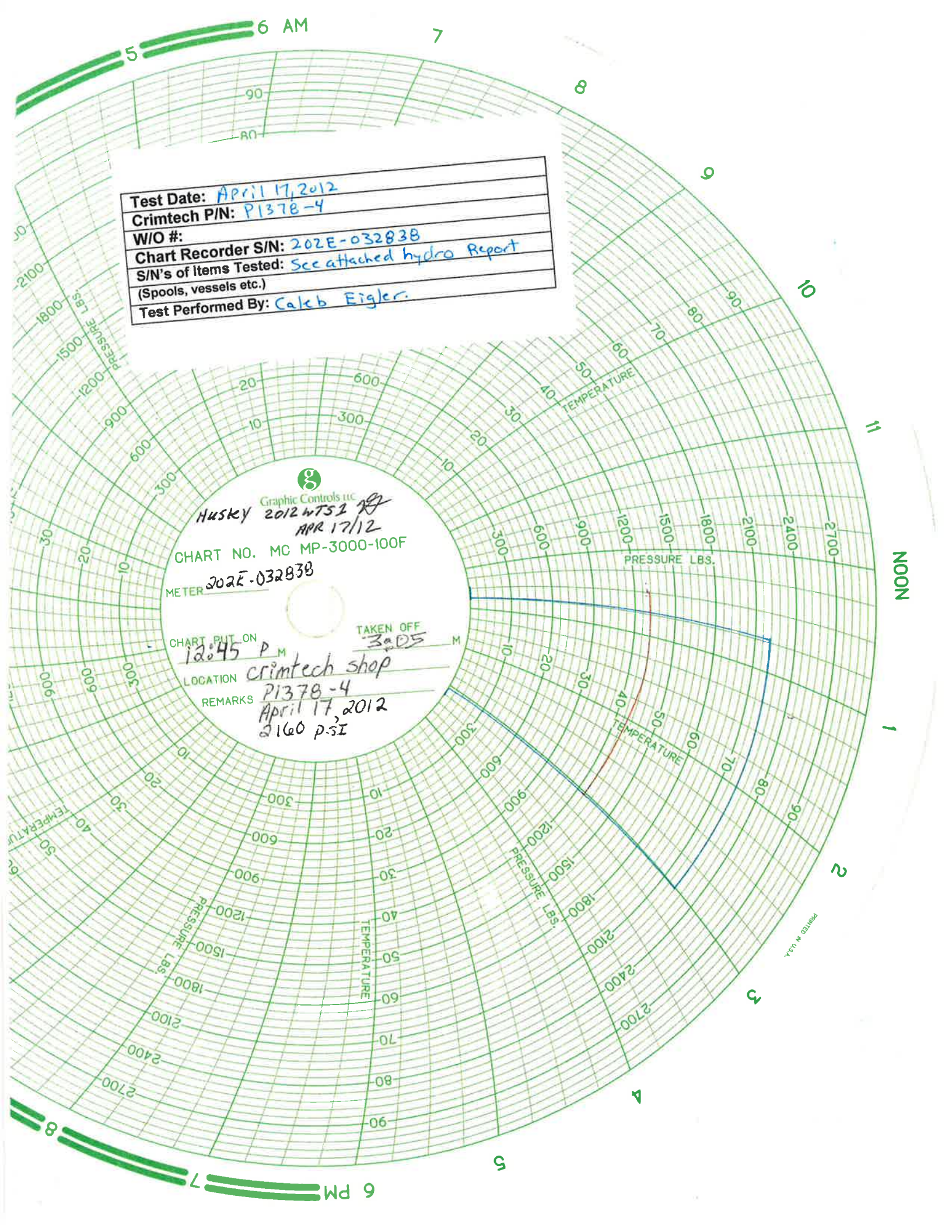
Test Pressure: 2160 (min) ☑ PSI ☐ kPa — Holding Time at Test Pressure (Minimum 15 minutes): 1 hour

Test Results:
held pressure and no leak's

Hydrostatic Test Verification: Pressure Test Code: ☐ ASME ☒ CSA ☐ ATMS

☐ N/A	K. Funduthus (Client Representative Name)	(Signature)	Date:	04 Mo	17 Day	12 Yr
☐ N/A	Kelly Gates (Crimtech QC Inspector Name)	Kelly Gates (Signature)	Date:	4 Mo	17 Day	12 Yr
☒ N/A	(Authorized Inspector Name)	(Signature)	Date:	Mo	Day	Yr

Comments:



Test Date:	April 17, 2012
Crimtech P/N:	P1378-4
W/O #:	
Chart Recorder S/N:	202E-032838
S/N's of Items Tested: (Spools, vessels etc.)	See attached hydro Report
Test Performed By:	Caleb Eigler.

Hydrostatic Test Report

Quality Control

CRIMTECH Services Ltd

Client:	Husky			Test Number:	1378-3,4,5,6 (Project Number - Seq)
Project Description:	Large Water Transfer Skids			Test Date:	08/29/2012 (MM/DD/YYYY)
Test Location:	Crimtech Shop	Vessel S/N:	N/A	Package CSN:	11432-11451 KG
Number of Spools in Hydro:		Number of Spools Recorded:			

Piping Spool S/N's: 20 Sets of 1" Threaded Stainless Piping

Batch 3-6

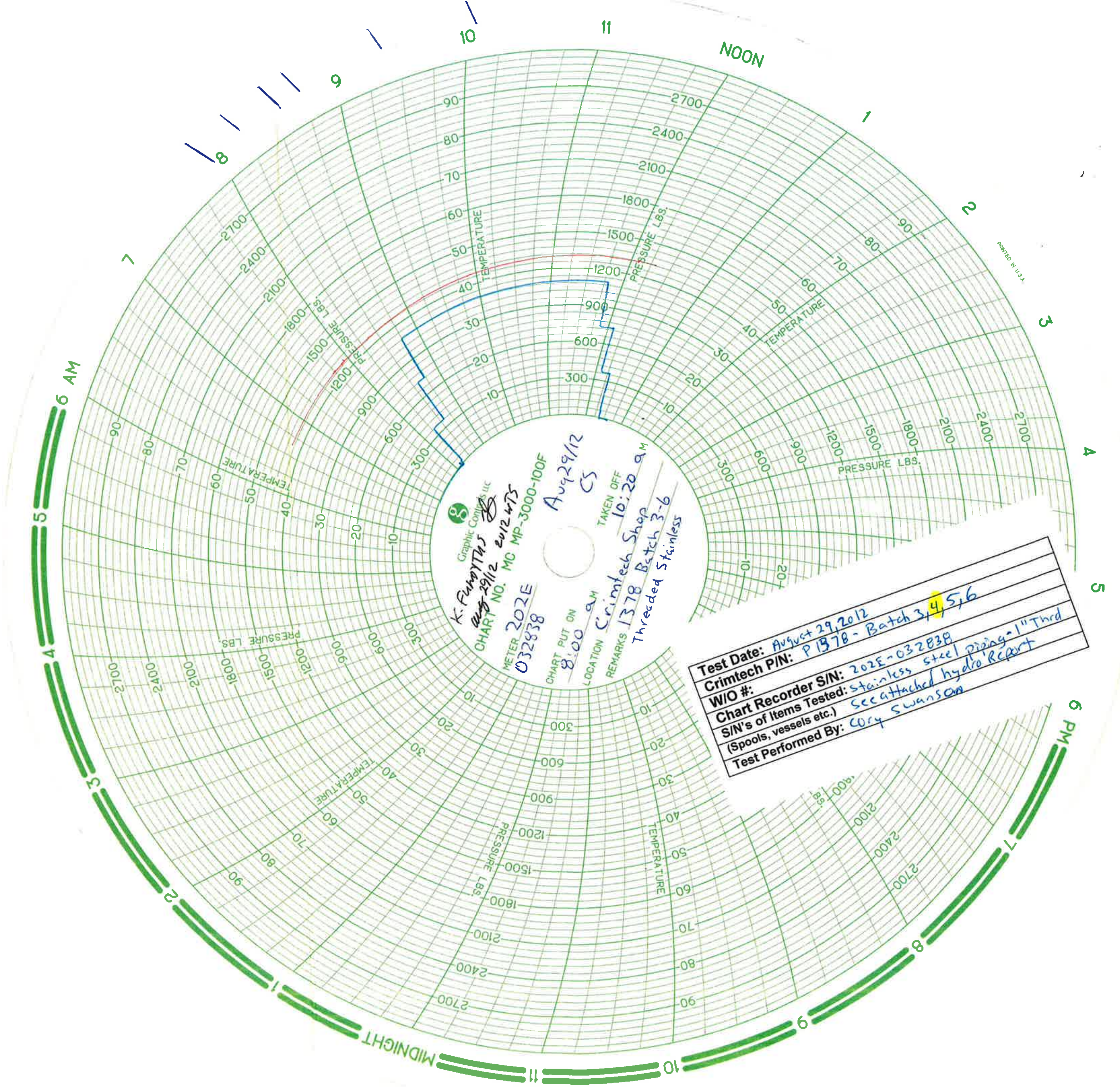
Pressure Test Preparation	Shop (Initials)	QC (Initials)
Area secured, flagged off, signs up, barracades & safety cages considered	CS	KG
Does the client have their own pressure test specifications to follow (ie. gauge calibration dates 6 or 12 months, dead weight gauge required)	CS	KG
Test pressure matches drawings (pressure gauges to be between 1.5 and 4 times the test pressure)	CS	KG
Hydrotest equipment calibration verified	CS	KG
Hoses, fittings, gauges suitable for test pressure and in good repair	CS	KG
All items which could be damaged by test isolated or removed (control valves, safety valves, instruments, lower pressure piping, vessels)	CS	KG
Equipment with internals that could be damaged, isolated or removed	CS	KG
All air bled out and fluid temperature stabilized	CS	KG
Valves opened halfway	CS	KG

Test Conducted By:	Cory Swanson	Test Medium: **Water**	
Test Gauge No's:	Crystal 547239, 203041-2-2	Chart Recorder No.:	202E-032838
Test Pressure: 1079 ☑ PSI ☐ kPa		Holding Time at Test Pressure: (Minimum 15 minutes)	1 hour

Test Results: No Visible Leaks at Time of Test

Hydrostatic Test Verification: Pressure Test Code: ☐ ASME ☒ CSA ☐ ATMS

☐ N/A	K. Funoytus (Client Representative Name)	(Signature)	Date: aug 29/12 (MM/DD/YYYY)
☐ N/A	Kelly Gates (Crimtech QC Inspector Name)	Kelly Gates (Signature)	Date: 08/29/12 (MM/DD/YYYY)
☒ N/A	(Authorized Inspector Name)	(Signature)	Date: (MM/DD/YYYY)



Graphic Controls LLC
CHART NO. MC MP-3000-100F
METER 202E 032838
CHART PUT ON 8:00 am
TAKEN OFF 10:20 am
Aug29/12
CS
LOCATION Crimtech Shop
REMARKS 1378 Batch 3-6 Threaded Stainless
K. Fumythus aug 29/12 2012 WTS
PRESSURE LBS.
TEMPERATURE
NOON
MIDNIGHT
6 AM
6 PM
Test Date: August 29, 2012
Crimtech P/N: P1378 - Batch 3, 4, 5, 6
W/O #:
Chart Recorder S/N: 202E-032838
S/N's of Items Tested: Stainless steel piping - 1" Thrd
(Spools, vessels etc.) See attached hydro Report
Test Performed By: Cory Swanson

Certificate of Calibration

Harvie Instruments Ltd. Certifies that this instrument was calibrated using measurement standards traceable to the National Research Council, Institute for National Measurement Standards.

Pressure Standard #1 TB-1 Hydraulic Dead Weight Tester
Pressure Standard #2 TB-2 Hydraulic Dead Weight Tester

Client: Crimtech Services **Date:** December 5, 2011

Device: Falcon EDWG **Device Accuracy Rating**
Serial #: 32595 .4 % of Span
Pressure Range: **5,000** PSI

Final Comparison Results					
Step #	% Scale	Standard	Gauge	Deviation	% Span
		psi	psi	psi	
1	0	0	0	0	0
2	10.0	500	500.5	0.5	0.01
3	20.0	1,000	1,000.3	0.3	0.01
4	40.0	2,000	2,000.1	0.1	0.00
5	60.0	3,000	2,999.7	-0.3	-0.01
6	80.0	4,000	3,999.5	-0.5	-0.01
7	100.0	5,000	4,998.1	-1.9	-0.04
8	50.0	2,500	2,500.0	0.0	0.00
9	0	0	0	0	0.00
Max. Deviation				1.9	0.04

ACCEPTED AT STATED ACCURACY
Calibrated/Certified by or under the direct supervision of:

D.Schulze
Calibration Technician

Remarks:

Any number of factors can cause the gauge to drift out of tolerance at any time following its calibration.

HARVIE Instruments Ltd

6884 - 52 Ave

Red Deer, AB. Canada T4N 4L1

Ph: 403-347-6001

Proudly Serving Industry Since 1967

Certificate of Calibration

Harvie Instruments Ltd. Certifies that this instrument was calibrated using measurement standards traceable to the National Research Council, Institute for National Measurement Standards.

Pressure Standard #1 Hydraulic Dead Weight Tester
Pressure Standard #2 Hydraulic Dead Weight Tester

Client: Crimtech Services Ltd. **Date:** March 12, 2012

Device: Wet Gauge **Device Accuracy Rating**
Serial #: 646472-1-1 1.00 % of Span
Pressure Range: **1,000** PSI

Final Comparison Results

Step #	% Scale	DW	Gauge	Deviation	% Span
		psi	psi	psi	
1	0	0	0	0.0	0
2	10	100	93	-7.0	-0.70
3	20	200	195	-5.0	-0.50
4	40	400	397	-3.0	-0.30
5	60	600	600	0.0	0.00
6	80	800	810	10.0	1.00
7	100	1,000	1,010	10.0	1.00
8	50	500	498	-2.0	-0.20
9	0	0	0	0	
Max. Deviation				10.0	1.00

ACCEPTED AT STATED ACCURACY
Calibrated/Certified by or under the direct supervision of:

Dany Schulze
D.Schulze
Calibration Technician

Remarks:

Any number of factors can cause the gauge to drift out of tolerance at any time following its calibration.

HARVIE Instruments Ltd

6884 - 52 Ave

Red Deer, AB. Canada T4N 4L1

Ph: 403-347-6001

Certificate of Calibration

Harvie Instruments Ltd. Certifies that this instrument was calibrated using measurement standards traceable to the National Research Council, Institute for National Measurement Standards.

Pressure Standard #1 TB-1 Hydraulic Dead Weight Tester
Pressure Standard #2 TB-2 Hydraulic Dead Weight Tester

Client: Crimtech Services **Date:** March 12, 2012

Device: Wet Gauge **Device Accuracy Rating**
Serial #: CT-003 1.00 % of Span
Press Range: **3,000** PSI

Final Comparison Results

Step #	% Scale	DW	Gauge	Deviation	% Span
		psi	psi	psi	
1	0	0	0	0	0
2	10	300	300	0	0.00
3	20	600	600	0	0.00
4	40	1,200	1,199	-1	-0.03
5	60	1,800	1,799	-1	-0.03
6	80	2,400	2,390	-10	-0.33
7	100	3,000	2,990	-10	-0.33
8	50	1,500	1,499	-1	-0.03
9	0	0	0		
Max. Deviation				10	0.33

ACCEPTED AT STATED ACCURACY
Calibrated/Certified by or under the direct supervision of:

Dave Schulze
D.Schulze
Calibration Technician

Remarks:

Any number of factors can cause the gauge to drift out of tolerance at any time following its calibration.

HARVIE Instruments Ltd

6884 - 52 Ave

Red Deer, AB. Canada T4N 4L1

Ph: 403-347-6001

Certificate of Calibration

Harvie Instruments Ltd. Certifies that this instrument was calibrated using measurement standards traceable to the National Research Council, Institute for National Measurement Standards.

Pressure Standard #1 Hydraulic Dead Weight Tester
Pressure Standard #2 Hydraulic Dead Weight Tester

Client: Crimtech Services **Date:** March 22, 2012

Device: Crystal DTG
Serial #: 547239
Pressure Range: **5,000** PSI

Device Accuracy Rating
.40 % of Span

Final Comparison Results

Step #	% Scale	DW	Gauge	Deviation	% Span
		psi	psi	psi	
1	0	0	0	0	0
2	10	500	500.2	0.2	0.00
3	20	1,000	1,000.1	0.1	0.00
4	40	2,000	1,999.7	-0.3	-0.01
5	60	3,000	2,999	-0.6	-0.01
6	80	4,000	3,998.9	-1.1	-0.02
7	100	5,000	4,997.4	-2.6	-0.05
8	50	2,500	2499.5	0.5	0.0
9	0	0	0		
Max. Deviation				2.6	0.05

ACCEPTED AT STATED ACCURACY
Calibrated/Certified by or under the direct supervision of:

J. Vincent
Calibration Technician

Remarks:

Any number of factors can cause the gauge to drift out of tolerance at any time following its calibration.

HARVIE Instruments Ltd

6884 - 52 Ave

Red Deer, AB. Canada T4N 4L1

Ph: 403-347-6001

Proudly Serving Industry Since 1967

Certificate of Calibration

Harvie Instruments Ltd. Certifies that this instrument was calibrated using measurement standards traceable to the National Research Council, Institute for National Measurement Standards.

Pressure Standard #1 Hydraulic Dead Weight Tester
Pressure Standard #2 Hydraulic Dead Weight Tester

Client: Crimtech Services **Date:** March 9, 2012

Device: Wet Gauge
Serial #: CT-006
Pressure Range: **5,000** PSI

Device Accuracy Rating
1.00 % of Span

Final Comparison Results					
Step #	% Scale	DW	Gauge	Deviation	% Span
		psi	psi	psi	
1	0	0	0	0	0
2	10.0	500	500	0	0.0
3	20.0	1,000	1,000	0	0.0
4	40.0	2,000	1,995	-5	-0.1
5	60.0	3,000	2,980	-20	-0.4
6	80.0	4,000	3,975	-25	-0.5
7	100.0	5,000	5,000	0	0.0
8	50.0	2,500	2,480	-20	-0.4
9	0	0	0	0	0.0
Max. Deviation				25	0.50

ACCEPTED AT STATED ACCURACY
Calibrated/Certified by or under the direct supervision of:

Dean Schulze
D.Schulze
Calibration Technician

Remarks:

HARVIE Instruments Ltd

6884 - 52 Ave

Red Deer, AB. Canada T4N 4L1

Ph: 403-347-6001

Certificate of Calibration

Harvie Instruments Ltd. Certifies that this instrument was calibrated using measurement standards traceable to the National Research Council, Institute for National Measurement Standards, Report MS-312 & MS-55.

Pressure Standard #1 TB1-FW
Pressure Standard #2 TB-1
Pressure Standard #3 WLP-1

Client:	Crimtech Services Ltd.	**Date:**	July 13, 2011
Device:	Crystal EDWG	**Device Accuracy Rating**	
Serial #:	545730	.4 % of Span	
Press Range:	5,000 PSI		

Final Comparison Results					
Step #	% Scale	DW	Gauge	Deviation	% Span
		psi	psi	psi	
1	0	0	0	0	0
2	10.0	500	500.1	0.1	0.002
3	20.0	1,000	999.7	-0.3	-0.006
4	40.0	2,000	1,998.8	-1.2	-0.024
5	60.0	3,000	2,997.5	-2.5	-0.050
6	80.0	4,000	3,995.7	-4.3	-0.086
7	100.0	5,000	4,993.6	-6.4	-0.128
8	50.0	2,500	2,498.2	-1.8	-0.036
9	0	0		0	0.0
10					
Max. Deviation				6.4	0.128

ACCEPTED AT STATED ACCURACY
Calibrated/Certified by or under the direct supervision of:

Denny Schulze
D.Schulze
Calibration Technician

Remarks:

HARVIE Instruments Ltd

6884 - 52 Ave

Red Deer, AB. Canada T4N 4L1

Ph: 403-347-6001

Proudly Serving Industry Since 1967

Certificate of Calibration

Harvie Instruments Ltd. Certifies that this instrument was calibrated using measurement standards traceable to the National Research Council, Institute for National Measurement Standards.

Pressure Standard #1 TB-1
Pressure Standard #2 TB-2
Pressure Standard #3 1208091

Client: Crimtech Services **Date:** May 11, 2012

Device: Wet Gauge **Device Accuracy Rating**
Serial #: 203041-2-2 1.00 % of Span
Press Range: 3,000 PSI

Final Comparison Results

Step #	% Scale	DW	Gauge	Deviation	% Span
		psi	psi	psi	
1	0	0	0	0	0
2	10	300	303	3	0.10
3	20	600	603	3	0.10
4	40	1,200	1,202	2	0.07
5	60	1,800	1,808	8	0.27
6	80	2,400	2,415	15	0.50
7	100	3,000	3,030	30	1.00
8	50	1,500	1,505	5	0.17
9	0	0	0		
Max. Deviation				30	1.00

ACCEPTED AT STATED ACCURACY
Calibrated/Certified by or under the direct supervision of:

J. Vincent
Calibration Technician

Remarks:

Any number of factors can cause the gauge to drift out of tolerance at any time following its calibration

HARVIE Instruments Ltd

6884 - 52 Ave
Red Deer, AB. Canada T4N 4L1
Ph: 403-347-6001

Certificate of Calibration

Harvie Instruments Ltd. Certifies that this instrument was calibrated using measurement standards traceable to the National Research Council, Institute for National Measurement Standards.

Pressure Standard #1 1208091 Manometer S/N 61480850
Pressure Standard #2 TB-1
Pressure Standard #3 TB-2
Temperature Reference: Liquid in glass thermometer

Client:	**Crimtech Services**		**Date:**	January 12, 2012
Device:	Chart Recorder			**Device Accuracy Rating**
Serial #:	202E-032838			1.00 % of Span
Pressure Range:	3,000	Psi		
Temperature Range:	150	Fahrenheit		

Final Comparison Results					
Step #	% Scale	DW	Recorder	Temperature Test	
		psi	psi	Standard	Meter
1	0	0	0		
2	10	300	300	32	32
3	20	600	600	64	64
4	40	1,200	1,200	86	86
5	60	1,800	1,800		
6	80	2,400	2,400		
7	100	3,000	3,000		
8	50	1,500	1,500		
9	0	0	0		

ACCEPTED AT STATED ACCURACY
Calibrated/Certified by or under the direct supervision of:

D. Schulze
Calibration Technician

Remarks:

HARVIE Instruments Ltd

6884 - 52 Ave

Red Deer, AB. Canada T4N 4L1

Ph: 403-347-6001

Certificate of Calibration

Harvie Instruments Ltd. Certifies that this instrument was calibrated using measurement standards traceable to the National Research Council, Institute for National Measurement Standards.

Pressure Standard #1 1208091 Manometer S/N 61480850
Pressure Standard #2 TB-1
Pressure Standard #3 TB-2
Temperature Reference: Liquid in glass thermometer

Client:	**Crimtech Services**	**Date:**	May 16, 2012
Device:	Chart Recorder	**Device Accuracy Rating**	
Serial #:	202E-032838	1.00 % of Span	
Pressure Range:	3,000	Psi	
Temperature Range:	150	Fahrenheit	

Final Comparison Results

Step #	% Scale	DW	Recorder	Temperature Test	
		psi	psi	Standard	Meter
1	0	0	0		
2	10	300	300	32	32
3	20	600	600	64	64
4	40	1,200	1,200	86	86
5	60	1,800	1,800		
6	80	2,400	2,400		
7	100	3,000	3,000		
8	50	1,500	1,500		
9	0	0	0		

ACCEPTED AT STATED ACCURACY
Calibrated/Certified by or under the direct supervision of:

D. Schulze
Calibration Technician

Remarks:

HARVIE Instruments Ltd

6884 - 52 Ave

Red Deer, AB. Canada T4N 4L1

Ph: 403-347-6001

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Certificate of Calibration

Harvie Instruments Ltd. Certifies that this instrument was calibrated using measurement standards traceable to the National Research Council, Institute for National Measurement Standards.

Pressure Standard #1 1208091 Manometer S/N 61480850
Pressure Standard #2 TB-1
Pressure Standard #3 TB1-FW
Temperature Reference: Liquid in glass thermometer

Client:	**Crimtech Services Ltd.**		**Date:**	August 26, 2011
Device:	Chart Recorder			**Device Accuracy Rating**
Serial #:	202EC-883847			1.00 % of Span
Pressure Range:		1,000	Psi	
Temperature Range:		150	Farenheit	

Final Comparison Results					
Step #	% Scale	DW	Recorder	Temperature Test	
		psi	psi	Standard	Meter
1	0	0	0		
2	10	100	100	32	32
3	20	200	200	64	64
4	40	400	400	86	86
5	60	600	600		
6	80	800	800		
7	100	1,000	1,000		
8	50	500	500		
9	0	0	0		

ACCEPTED AT STATED ACCURACY
Calibrated/Certified by or under the direct supervision of:

Mark Ibanez
Calibration Technician

Remarks:

HARVIE Instruments Ltd

6884 - 52 Ave

Red Deer, AB. Canada T4N 4L1

Ph: 403-347-6001

Proudly Serving Industry Since 1967

Certificate of Calibration

Harvie Instruments Ltd. Certifies that this instrument was calibrated using measurement standards traceable to the National Research Council, Institute for National Measurement Standards.

Pressure Standard #1 1208091 Manometer S/N 61480850
Pressure Standard #2 TB-1
Pressure Standard #3 TB1-FW
Temperature Reference: Liquid in glass thermometer

Client:	**Crimtech Services**		**Date:**	January 12, 2012
Device:	Chart Recorder			**Device Accuracy Rating**
Serial #:	202E-160920			1.00 % of Span
Pressure Range:		3,000	Psi	
Temperature Range:		150	Farenheit	

Final Comparison Results

Step #	% Scale	DW	Recorder	Temperature Test	
		psi	psi	Standard	Meter
1	0	0	0		
2	10	300	300	32	32
3	20	600	600	64	64
4	40	1,200	1,200	86	86
5	60	1,800	1,800	125	125
6	80	2,400	2,400		
7	100	3,000	3,000		
8	50	1,500	1,500		
9	0	0	0		

ACCEPTED AT STATED ACCURACY
Calibrated/Certified by or under the direct supervision of:

D. Schulze
Calibration Technician

Remarks:

HARVIE Instruments Ltd

6884 - 52 Ave
Red Deer, AB. Canada T4N 4L1
Ph: 403-347-6001

Proudly Serving Industry Since 1967

Pneumatic Test Report

Quality Control

CRIMTECH Services Ltd

Client:	Husky	Test Number:	1578-4 (Project Number - Seq)
Project Description:	Water transfer skids	Test Date:	10/11/2012 (MM/DD/YYYY)
Test Location:	Crimtech Shop	Package CSN:	11437
Number of Spools in Test:	N/A	Number of Spools Recorded:	N/A

Piping Spool S/N's:

Stored Energy Determined by:

- ☐ Engineering Report attached
- ☑ Stored Energy Calculation Worksheet attached

Total Stored Energy: 18 kJ

Pressure Test Preparation	Shop (Initials)	QC (Initials)
Area secured, flagged off, signs up, barracades & safety cages considered. Barricade set-back 30 m (100 ft) unless safety cages or alternate method used (i.e. inside a building)	CS	
Does the client have their own pressure test specifications to follow (ie. gauge calibration dates 6 or 12 months, dead weight gauge required)	CS	
Test pressure matches drawings (pressure gauges to be between 1.5 and 4 times the test pressure)	CS	
Pressure test equipment calibrations verified	CS	
Hoses, fittings, gauges suitable for test pressure and in good repair	CS	
Valves opened halfway	CS	

Test Conducted By:	Cory Swanson	Test Medium:	☑ Air ☐ Nitrogen
Test Gauge No's:	New Gauges on Skid	Chart Recorder No.:	N/A
Test Pressure:	690 ☐ PSI ☑ kPa	Holding Time at Test Pressure: (Minimum 10 minutes)	15 min

Step No.	1	2	3	4	5	6	7	8	9	10
Pressure										
Hold Time (min)										

Test Results: All Connections were sprayed with Snoop ® Liquid Leak Dector solution or equivalent. There were no visible leaks at the time of test. All functions correct.

Pneumatic Test Verification:

Pressure Test Code: ☐ ASME ☒ CSA ☐ ATMS ☒ other

☐ N/A	K. Fumerton (Client Representative Name)	(Signature)	Date:	oct 11/12 (MM/DD/YYYY)
☐ N/A	Kaylon Clements (Crimtech QC Inspector Name)	(Signature)	Date:	10/11/12 (MM/DD/YYYY)
☒ N/A	(Authorized Inspector Name)	(Signature)	Date:	(MM/DD/YYYY)

Stored Energy Calculation Worksheet

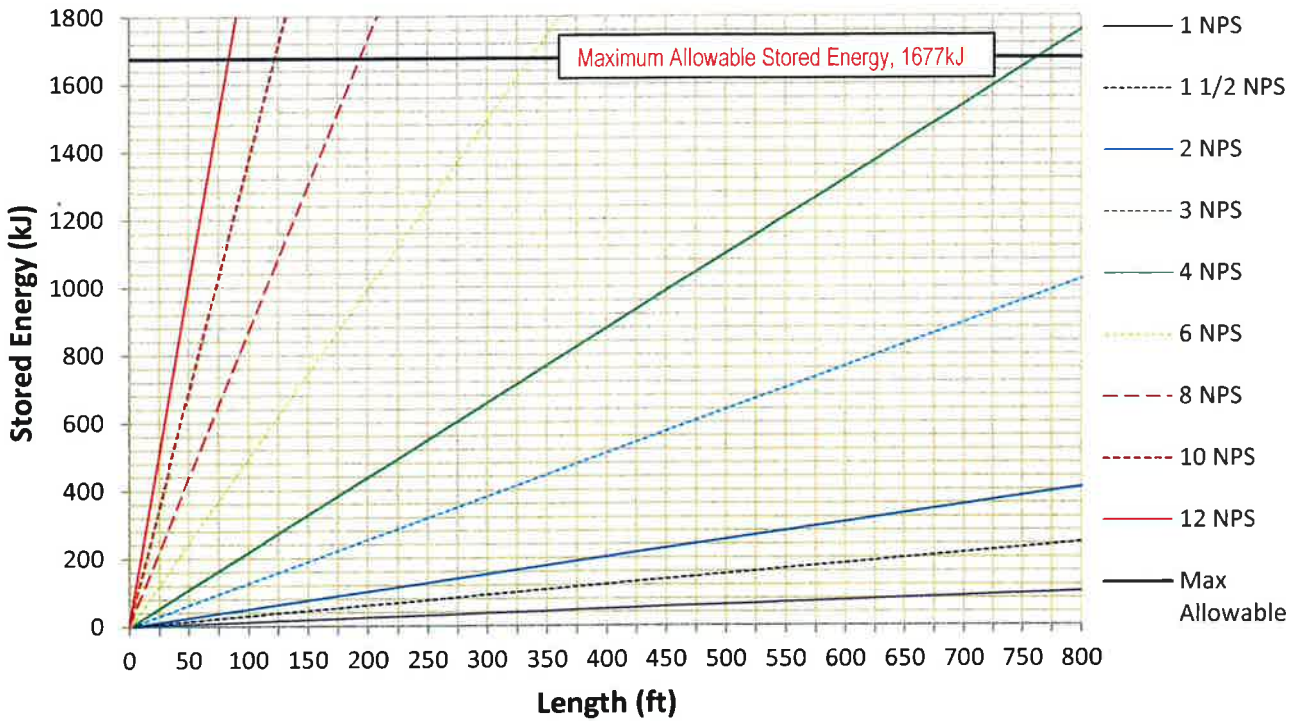
Quality Control

100 psi (690 kPa) Test Procedure

CRIMTECH Services Ltd

Client	Husky Energy	Test Number:	P1378-5 (Project Number – Seq)
Project Description:	Large water transfer skids	Test Date:	10/24/2012 (MM/DD/YYYY)
Calculation Completed By:	Caleb Engler		CSN 114~~37~~

Stored Energy at 100 PSI



To calculate the stored energy of pipework use the following steps:

1. Find the required length of pipe on the X axis (along the bottom of the graph).
2. Move up the graph to the correct pipe size (NPS).
3. Look across to the Y axis (the left side of the graph) and read the stored energy.
4. Record the stored energy in the table to the right.
5. Repeat steps 1 to 4 for all pipe sizes to be tested.
6. Add the stored energy for each NPS in the table to find the total stored energy to be tested.
7. If the total stored energy is under 1677 kJ the test may be carried out using WP-04-0494-CS Pneumatic Strength Test for ASME Pipework.
8. If the total stored energy is over 1677 kJ DO NOT CONDUCT TEST. Consult Engineering Department for alternative test.

Stored Energy Calculation Table

	NPS	Length of Pipe (ft)	Stored Energy (kJ) from graph
1	3"	8 ½	10 KJ
2	2"	23½	6 KJ
3	1"	4½	2KJ
4			
5			
6			
7			
8			
9			
10			
Total Stored Energy =		18	kJ

Note:

1. All lines sizes based on schedule 40 pipe wall thicknesses.
2. Use the 1 NPS line for piping and tubing sizes less than 1 NPS.

Pneumatic Test Report

Quality Control

CRIMTECH Services Ltd

Client:	Husky Energy	Test Number:	P1378-4 (Project Number - Seq)
Project Description:	Large Water Transfer unit	Test Date:	10/11/2012 (MM/DD/YYYY)
Test Location:	Crimtech Shop	Package CSN:	11438
Number of Spools in Test:	NA	Number of Spools Recorded:	NA

Piping Spool S/N's:

Stored Energy Determined by:

- ☐ Engineering Report attached
- ☑ Stored Energy Calculation Worksheet attached

Total Stored Energy: 18 kJ

Pressure Test Preparation	Shop (Initials)	QC (Initials)
Area secured, flagged off, signs up, barracades & safety cages considered. Barricade set-back 30 m (100 ft) unless safety cages or alternate method used (i.e. inside a building)	CE.	
Does the client have their own pressure test specifications to follow (ie. gauge calibration dates 6 or 12 months, dead weight gauge required)	CE.	
Test pressure matches drawings (pressure gauges to be between 1.5 and 4 times the test pressure)	CE.	
Pressure test equipment calibrations verified	CE.	
Hoses, fittings, gauges suitable for test pressure and in good repair	CE.	
Valves opened halfway	CE.	

Test Conducted By:	Cory Swanson	Test Medium:	☑ Air ☐ Nitrogen
Test Gauge No's:	New gauges on skid	Chart Recorder No.:	N/A
Test Pressure:	690 ☐ PSI ☑ kPa	Holding Time at Test Pressure: (Minimum 10 minutes)	15 minutes min.

Step No.	1	2	3	4	5	6	7	8	9	10
Pressure										
Hold Time (min)										

Test Results: All Connections were sprayed with Snoop ® Liquid Leak Dector solution or equivalent. There were no visible leaks at the time of test. All functions correct.

Pneumatic Test Verification:

Pressure Test Code: ☐ ASME ☒ CSA ☐ ATMS ☒ other

☐ N/A	K. Funoytus (Client Representative Name)	(Signature)	Date:	oct 11/12 (MM/DD/YYYY)
☐ N/A	Kaylon Clement (Crimtech QC Inspector Name)	(Signature)	Date:	10/11/12 (MM/DD/YYYY)
☒ N/A	(Authorized Inspector Name)	(Signature)	Date:	(MM/DD/YYYY)

Stored Energy Calculation Worksheet

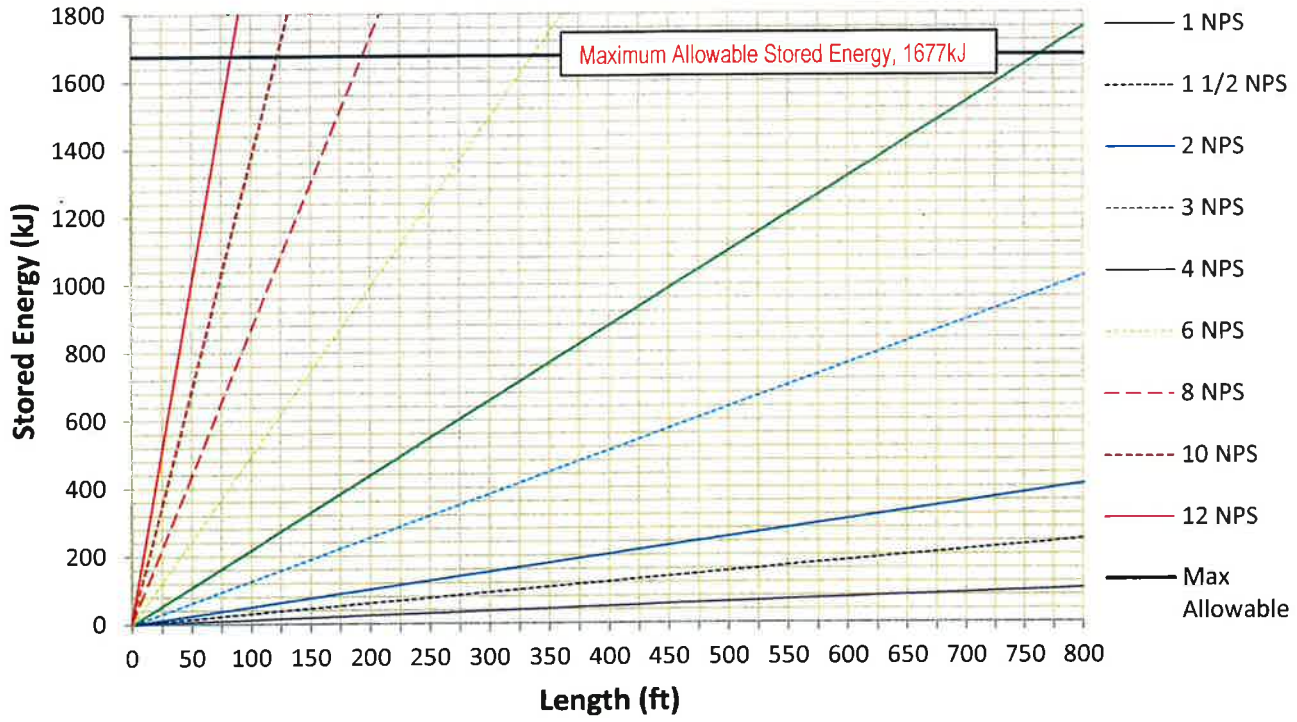
Quality Control

100 psi (690 kPa) Test Procedure

CRIMTECH Services Ltd

Client	Husky Energy	Test Number:	P1378-5 (Project Number – Seq)
Project Description:	Large water transfer skids	Test Date:	10/24/2012 (MM/DD/YYYY)
Calculation Completed By:	Caleb Engler		CSN 114388

Stored Energy at 100 PSI



To calculate the stored energy of pipework use the following steps:

1. Find the required length of pipe on the X axis (along the bottom of the graph).
2. Move up the graph to the correct pipe size (NPS).
3. Look across to the Y axis (the left side of the graph) and read the stored energy.
4. Record the stored energy in the table to the right.
5. Repeat steps 1 to 4 for all pipe sizes to be tested.
6. Add the stored energy for each NPS in the table to find the total stored energy to be tested.
7. If the total stored energy is under 1677 kJ the test may be carried out using WP-04-0494-CS Pneumatic Strength Test for ASME Pipework.
8. If the total stored energy is over 1677 kJ DO NOT CONDUCT TEST. Consult Engineering Department for alternative test.

Stored Energy Calculation Table

	NPS	Length of Pipe (ft)	Stored Energy (kJ) from graph
1	3"	8 ½	10 KJ
2	2"	23 ½	6 KJ
3	1"	4 ½	2 KJ
4			
5			
6			
7			
8			
9			
10			
Total Stored Energy =		18	kJ

Note:

1. All lines sizes based on schedule 40 pipe wall thicknesses.
2. Use the 1 NPS line for piping and tubing sizes less than 1 NPS.

Pneumatic Test Report

Quality Control

CRIMTECH Services Ltd

Client:	Husky Energy	Test Number:	P1378-4 (Project Number - Seq)
Project Description:	Large Water Transfer Unit	Test Date:	10/11/2012 (MM/DD/YYYY)
Test Location:	Crimtech Shop	Package CSN:	11439
Number of Spools in Test:	NA	Number of Spools Recorded:	NA

Piping Spool S/N's:

Stored Energy Determined by:

- ☐ Engineering Report attached
- ☑ Stored Energy Calculation Worksheet attached

Total Stored Energy: 18 kJ

Pressure Test Preparation	Shop (Initials)	QC (Initials)
Area secured, flagged off, signs up, barracades & safety cages considered. Barricade set-back 30 m (100 ft) unless safety cages or alternate method used (i.e. inside a building)	CE	ℛ
Does the client have their own pressure test specifications to follow (ie. gauge calibration dates 6 or 12 months, dead weight gauge required)	CE.	ℛ
Test pressure matches drawings (pressure gauges to be between 1.5 and 4 times the test pressure)	CE	ℛ
Pressure test equipment calibrations verified	CE	ℛ
Hoses, fittings, gauges suitable for test pressure and in good repair	CE	ℛ
Valves opened halfway	CE.	ℛ

Test Conducted By:	Cory Swanson	Test Medium:	☑ Air ☐ Nitrogen
Test Gauge No's:	New gauges on Skid	Chart Recorder No.:	NA
Test Pressure:	690 ☐ PSI ☑ kPa	Holding Time at Test Pressure: (Minimum 10 minutes)	15 minutes min.

Step No.	1	2	3	4	5	6	7	8	9	10
Pressure										
Hold Time (min)										

Test Results: All Connections were sprayed with Snoop ® Liquid Leak Dector solution or equivalent. There were no visible leaks at the time of test. All functions correct.

Pneumatic Test Verification:

Pressure Test Code: ☐ ASME ☒ CSA ☐ ATMS ☒ other

☐ N/A	K. Fernovits (Client Representative Name)	(Signature)	Date:	oct 11/12 (MM/DD/YYYY)
☐ N/A	Kaylon Clement (Crimtech QC Inspector Name)	(Signature)	Date:	10/11/12 (MM/DD/YYYY)
☒ N/A	(Authorized Inspector Name)	(Signature)	Date:	(MM/DD/YYYY)

Stored Energy Calculation Worksheet

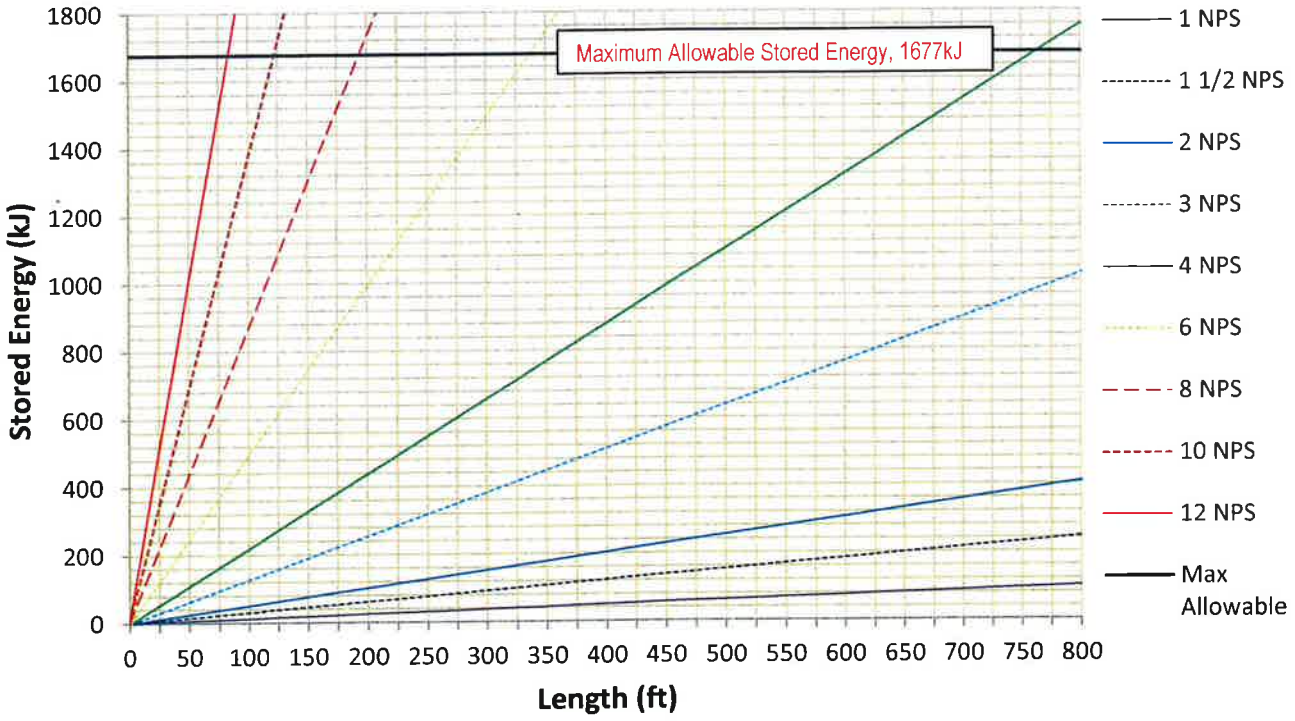
Quality Control

100 psi (690 kPa) Test Procedure

CRIMTECH Services Ltd

Client	Husky Energy	Test Number:	P1378-5 (Project Number – Seq)
Project Description:	Large water transfer skids	Test Date:	10/24/2012 (MM/DD/YYYY)
Calculation Completed By:	Caleb Engler		CSN 11439

Stored Energy at 100 PSI



To calculate the stored energy of pipework use the following steps:

1. Find the required length of pipe on the X axis (along the bottom of the graph).
2. Move up the graph to the correct pipe size (NPS).
3. Look across to the Y axis (the left side of the graph) and read the stored energy.
4. Record the stored energy in the table to the right.
5. Repeat steps 1 to 4 for all pipe sizes to be tested.
6. Add the stored energy for each NPS in the table to find the total stored energy to be tested.
7. If the total stored energy is under 1677 kJ the test may be carried out using WP-04-0494-CS Pneumatic Strength Test for ASME Pipework.
8. If the total stored energy is over 1677 kJ DO NOT CONDUCT TEST. Consult Engineering Department for alternative test.

Stored Energy Calculation Table

	NPS	Length of Pipe (ft)	Stored Energy (kJ) from graph
1	3"	8 ½	10 KJ
2	2"	23 ½	6 KJ
3	1"	4 ½	2 KJ
4			
5			
6			
7			
8			
9			
10			
Total Stored Energy =		18	kJ

Note:

1. All lines sizes based on schedule 40 pipe wall thicknesses.
2. Use the 1 NPS line for piping and tubing sizes less than 1 NPS.

Pneumatic Test Report

Quality Control

CRIMTECH Services Ltd

Client:	Husky Energy	Test Number:	PH9378-4 (Project Number - Seq)
Project Description:	Large Water Transfer unit	Test Date:	10/11/2012 (MM/DD/YYYY)
Test Location:	Crimtech Shop	Package CSN:	11440
Number of Spools in Test:	NA	Number of Spools Recorded:	NA

Piping Spool S/N's:

Stored Energy Determined by:

☐ Engineering Report attached

☑ Stored Energy Calculation Worksheet attached

Total Stored Energy: 18 kJ

Pressure Test Preparation	Shop (Initials)	QC (Initials)
Area secured, flagged off, signs up, barracades & safety cages considered. Barricade set-back 30 m (100 ft) unless safety cages or alternate method used (i.e. inside a building)	CE.	
Does the client have their own pressure test specifications to follow (ie. gauge calibration dates 6 or 12 months, dead weight gauge required)	CE.	
Test pressure matches drawings (pressure gauges to be between 1.5 and 4 times the test pressure)	CE.	
Pressure test equipment calibrations verified	CE.	
Hoses, fittings, gauges suitable for test pressure and in good repair	CE.	
Valves opened halfway	CE.	

Test Conducted By:	Cory Swanson	Test Medium: ☑ Air ☐ Nitrogen	
Test Gauge No's:	New gauges on skid	Chart Recorder No.:	NA
Test Pressure: 690	☐ PSI ☑ kPa	Holding Time at Test Pressure: (Minimum 10 minutes)	15 minutes min.

Step No.	1	2	3	4	5	6	7	8	9	10
Pressure										
Hold Time (min)										

Test Results: All Connections were sprayed with Snoop ® Liquid Leak Dector solution or equivalent. There were no visible leaks at the time of test. All functions correct.

Pneumatic Test Verification:

Pressure Test Code: ☐ ASME ☒ CSA ☐ ATMS ☒ other

☐ N/A	K. Fernandes (Client Representative Name)	(Signature)	Date: oct 11/12 (MM/DD/YYYY)
☐ N/A	Kaylon Clement (Crimtech QC Inspector Name)	(Signature)	Date: 10/11/12 (MM/DD/YYYY)
☒ N/A	(Authorized Inspector Name)	(Signature)	Date: (MM/DD/YYYY)

Stored Energy Calculation Worksheet

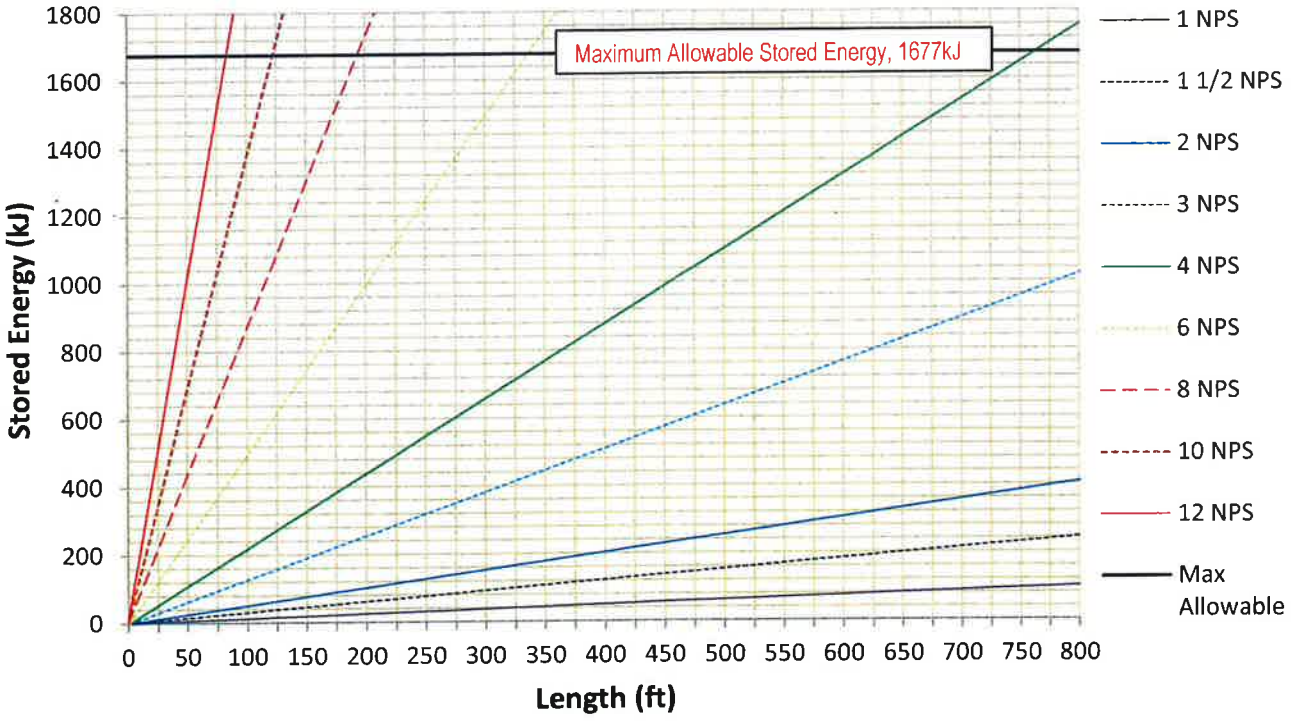
Quality Control

100 psi (690 kPa) Test Procedure

CRIMTECH Services Ltd

Client	Husky Energy	Test Number:	P1378-5 (Project Number – Seq)
Project Description:	Large water transfer skids	Test Date:	10/24/2012 (MM/DD/YYYY)
Calculation Completed By:	Caleb Engler		CSN 11440

Stored Energy at 100 PSI



To calculate the stored energy of pipework use the following steps:

1. Find the required length of pipe on the X axis (along the bottom of the graph).
2. Move up the graph to the correct pipe size (NPS).
3. Look across to the Y axis (the left side of the graph) and read the stored energy.
4. Record the stored energy in the table to the right.
5. Repeat steps 1 to 4 for all pipe sizes to be tested.
6. Add the stored energy for each NPS in the table to find the total stored energy to be tested.
7. If the total stored energy is under 1677 kJ the test may be carried out using WP-04-0494-CS Pneumatic Strength Test for ASME Pipework.
8. If the total stored energy is over 1677 kJ DO NOT CONDUCT TEST. Consult Engineering Department for alternative test.

Stored Energy Calculation Table

	NPS	Length of Pipe (ft)	Stored Energy (kJ) from graph
1	3"	8 ½	10 KJ
2	2"	23 ½	6 KJ
3	1"	4 ½	2 KJ
4			
5			
6			
7			
8			
9			
10			
Total Stored Energy =		18	kJ

Note:

1. All lines sizes based on schedule 40 pipe wall thicknesses.
2. Use the 1 NPS line for piping and tubing sizes less than 1 NPS.

Pneumatic Test Report

Quality Control

CRIMTECH Services Ltd

Client:	Husky Energy	Test Number:	P1378-4 (Project Number - Seq)
Project Description:	Large Water Transfer Unit	Test Date:	10/11/2012 (MM/DD/YYYY)
Test Location:	Crimtech Shop	Package CSN:	11441
Number of Spools in Test:	N/A	Number of Spools Recorded:	N/A

Piping Spool S/N's:

Stored Energy Determined by:
- ☐ Engineering Report attached
- ☑ Stored Energy Calculation Worksheet attached

Total Stored Energy: 18 kJ

Pressure Test Preparation	Shop (Initials)	QC (Initials)
Area secured, flagged off, signs up, barracades & safety cages considered. Barricade set-back 30 m (100 ft) unless safety cages or alternate method used (i.e. inside a building)	CE.	
Does the client have their own pressure test specifications to follow (ie. gauge calibration dates 6 or 12 months, dead weight gauge required)	CE.	
Test pressure matches drawings (pressure gauges to be between 1.5 and 4 times the test pressure)	CE.	
Pressure test equipment calibrations verified	CE.	
Hoses, fittings, gauges suitable for test pressure and in good repair	CE.	
Valves opened halfway	CE.	

Test Conducted By:	Cory Swanson	Test Medium:	☒ Air ☐ Nitrogen
Test Gauge No's:	New Gauges on Skid	Chart Recorder No.:	N/A
Test Pressure:	690 ☐ PSI ☑ kPa	Holding Time at Test Pressure: (Minimum 10 minutes)	15 minutes min.

Step No.	1	2	3	4	5	6	7	8	9	10
Pressure										
Hold Time (min)										

Test Results: All Connections were sprayed with Snoop ® Liquid Leak Dector solution or equivalent. There were no visible leaks at the time of test. All functions correct.

Pneumatic Test Verification:

Pressure Test Code: ☐ ASME ☒ CSA ☐ ATMS ☒ other ~~AA~~

☐ N/A	K. Fanovtus (Client Representative Name)	(Signature)	Date: ~~Oct~~ 11/12 (MM/DD/YYYY)
☐ N/A	Krayton Clement (Crimtech QC Inspector Name)	(Signature)	Date: 10/11/12 (MM/DD/YYYY)
☒ N/A	(Authorized Inspector Name)	(Signature)	Date: (MM/DD/YYYY)

Stored Energy Calculation Worksheet

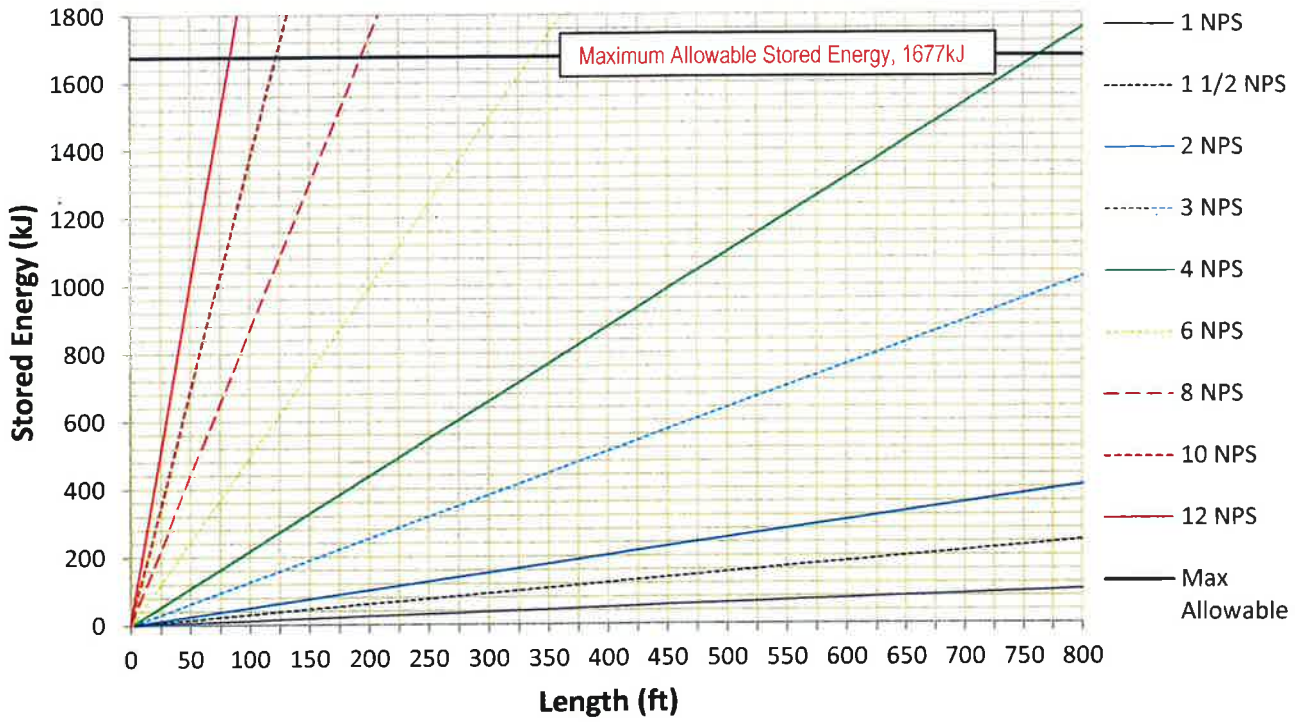
Quality Control

100 psi (690 kPa) Test Procedure

CRIMTECH Services Ltd

Client	Husky Energy	Test Number:	P1378-5 (Project Number – Seq)
Project Description:	Large water transfer skids	Test Date:	10/24/2012 (MM/DD/YYYY)
Calculation Completed By:	Caleb Egler		CSN 11441

Stored Energy at 100 PSI



To calculate the stored energy of pipework use the following steps:

1. Find the required length of pipe on the X axis (along the bottom of the graph).
2. Move up the graph to the correct pipe size (NPS).
3. Look across to the Y axis (the left side of the graph) and read the stored energy.
4. Record the stored energy in the table to the right.
5. Repeat steps 1 to 4 for all pipe sizes to be tested.
6. Add the stored energy for each NPS in the table to find the total stored energy to be tested.
7. If the total stored energy is under 1677 kJ the test may be carried out using WP-04-0494-CS Pneumatic Strength Test for ASME Pipework.
8. If the total stored energy is over 1677 kJ DO NOT CONDUCT TEST. Consult Engineering Department for alternative test.

Stored Energy Calculation Table

	NPS	Length of Pipe (ft)	Stored Energy (kJ) from graph
1	3"	8 ½	10 KJ
2	2"	23 ½	6 KJ
3	1"	4 ½	2 KJ
4			
5			
6			
7			
8			
9			
10			
Total Stored Energy =		18	kJ

Note:

1. All lines sizes based on schedule 40 pipe wall thicknesses.
2. Use the 1 NPS line for piping and tubing sizes less than 1 NPS.

Pneumatic Test Report

Quality Control

CRIMTECH Services Ltd

Client:	Husky	Test Number:	1578-4 (Project Number - Seq)
Project Description:	Water transfer skids	Test Date:	10/11/2012 (MM/DD/YYYY)
Test Location:	Crimtech Shop	Package CSN:	11437
Number of Spools in Test:	N/A	Number of Spools Recorded:	N/A

Piping Spool S/N's:

Stored Energy Determined by:

- ☐ Engineering Report attached
- ☑ Stored Energy Calculation Worksheet attached

Total Stored Energy: 18 kJ

Pressure Test Preparation	Shop (Initials)	QC (Initials)
Area secured, flagged off, signs up, barracades & safety cages considered. Barricade set-back 30 m (100 ft) unless safety cages or alternate method used (i.e. inside a building)	CS	
Does the client have their own pressure test specifications to follow (ie. gauge calibration dates 6 or 12 months, dead weight gauge required)	CS	
Test pressure matches drawings (pressure gauges to be between 1.5 and 4 times the test pressure)	CS	
Pressure test equipment calibrations verified	CS	
Hoses, fittings, gauges suitable for test pressure and in good repair	CS	
Valves opened halfway	CS	

Test Conducted By:	Cory Swanson	Test Medium:	☑ Air ☐ Nitrogen
Test Gauge No's:	New Gauges on Skid	Chart Recorder No.:	N/A
Test Pressure:	690 ☐ PSI ☑ kPa	Holding Time at Test Pressure: (Minimum 10 minutes)	15 min

Step No.	1	2	3	4	5	6	7	8	9	10
Pressure										
Hold Time (min)										

Test Results: All Connections were sprayed with Snoop ® Liquid Leak Dector solution or equivalent. There were no visible leaks at the time of test. All functions correct.

Pneumatic Test Verification:

Pressure Test Code: ☐ ASME ☒ CSA ☐ ATMS ☒ other

☐ N/A	K. Fumerton (Client Representative Name)	(Signature)	Date: oct 11/12	(MM/DD/YYYY)
☐ N/A	Kaylon Clement (Crimtech QC Inspector Name)	(Signature)	Date: 10/11/12	(MM/DD/YYYY)
☒ N/A	(Authorized Inspector Name)	(Signature)	Date:	(MM/DD/YYYY)

Stored Energy Calculation Worksheet

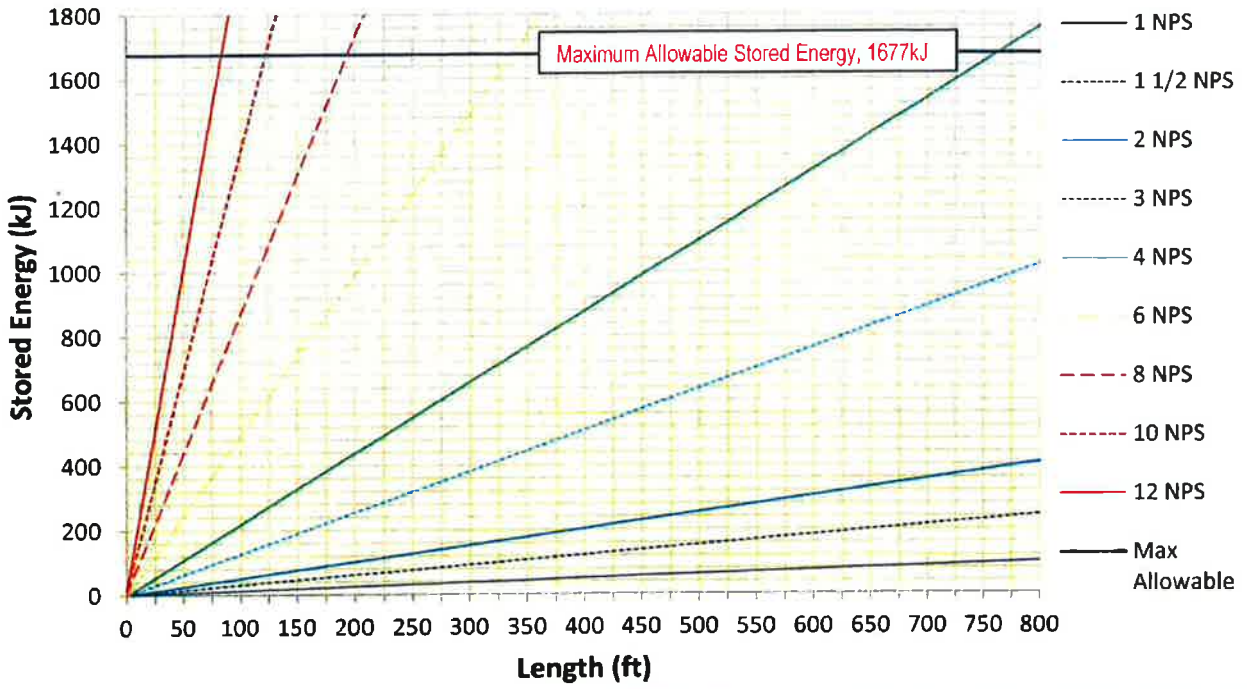
Quality Control

100 psi (690 kPa) Test Procedure

CRIMTECH Services Ltd

Client	Husky Energy	Test Number:	P1378-5 (Project Number – Seq)
Project Description:	Large water transfer skids	Test Date:	10/24/2012 (MM/DD/YYYY)
Calculation Completed By:	Caleb Engler		CSN 114374

Stored Energy at 100 PSI



To calculate the stored energy of pipework use the following steps:

1. Find the required length of pipe on the X axis (along the bottom of the graph).
2. Move up the graph to the correct pipe size (NPS).
3. Look across to the Y axis (the left side of the graph) and read the stored energy.
4. Record the stored energy in the table to the right.
5. Repeat steps 1 to 4 for all pipe sizes to be tested.
6. Add the stored energy for each NPS in the table to find the total stored energy to be tested.
7. If the total stored energy is under 1677 kJ the test may be carried out using WP-04-0494-CS Pneumatic Strength Test for ASME Pipework.
8. If the total stored energy is over 1677 kJ DO NOT CONDUCT TEST. Consult Engineering Department for alternative test.

Stored Energy Calculation Table

	NPS	Length of Pipe (ft)	Stored Energy (kJ) from graph
1	3"	8 ½	10 KJ
2	2"	23 ½	6 KJ
3	1"	4 ½	2KJ
4			
5			
6			
7			
8			
9			
10			
Total Stored Energy =		18	kJ

Note:

1. All lines sizes based on schedule 40 pipe wall thicknesses.
2. Use the 1 NPS line for piping and tubing sizes less than 1 NPS.

Pneumatic Test Report

Quality Control

CRIMTECH Services Ltd

Client:	Husky Energy	Test Number:	P1378-4 (Project Number - Seq)
Project Description:	Large Water Transfer unit	Test Date:	10/11/2012 (MM/DD/YYYY)
Test Location:	Crimtech Shop	Package CSN:	11438
Number of Spools in Test:	NA	Number of Spools Recorded:	NA

Piping Spool S/N's:

Stored Energy Determined by:
- ☐ Engineering Report attached
- ☑ Stored Energy Calculation Worksheet attached

Total Stored Energy: 18 kJ

Pressure Test Preparation	Shop (Initials)	QC (Initials)
Area secured, flagged off, signs up, barracades & safety cages considered. Barricade set-back 30 m (100 ft) unless safety cages or alternate method used (i.e. inside a building)	CE.	
Does the client have their own pressure test specifications to follow (ie. gauge calibration dates 6 or 12 months, dead weight gauge required)	CE.	
Test pressure matches drawings (pressure gauges to be between 1.5 and 4 times the test pressure)	CE.	
Pressure test equipment calibrations verified	CE.	
Hoses, fittings, gauges suitable for test pressure and in good repair	CE.	
Valves opened halfway	CE.	

Test Conducted By:	Cory Swanson	Test Medium:	☑ Air ☐ Nitrogen
Test Gauge No's:	New gauges on skid	Chart Recorder No.:	N/A
Test Pressure:	690 ☐ PSI ☑ kPa	Holding Time at Test Pressure: (Minimum 10 minutes)	15 minutes min.

Step No.	1	2	3	4	5	6	7	8	9	10
Pressure										
Hold Time (min)										

Test Results: All Connections were sprayed with Snoop ® Liquid Leak Dector solution or equivalent. There were no visible leaks at the time of test. All functions correct.

Pneumatic Test Verification:

Pressure Test Code: ☐ ASME ☒ CSA ☐ ATMS ☒ other

☐ N/A	K. Funoytus (Client Representative Name)	(Signature)	Date: Oct 11/12 (MM/DD/YYYY)
☐ N/A	Kaylon Clement (Crimtech QC Inspector Name)	(Signature)	Date: 10/11/12 (MM/DD/YYYY)
☒ N/A	(Authorized Inspector Name)	(Signature)	Date: (MM/DD/YYYY)

Stored Energy Calculation Worksheet

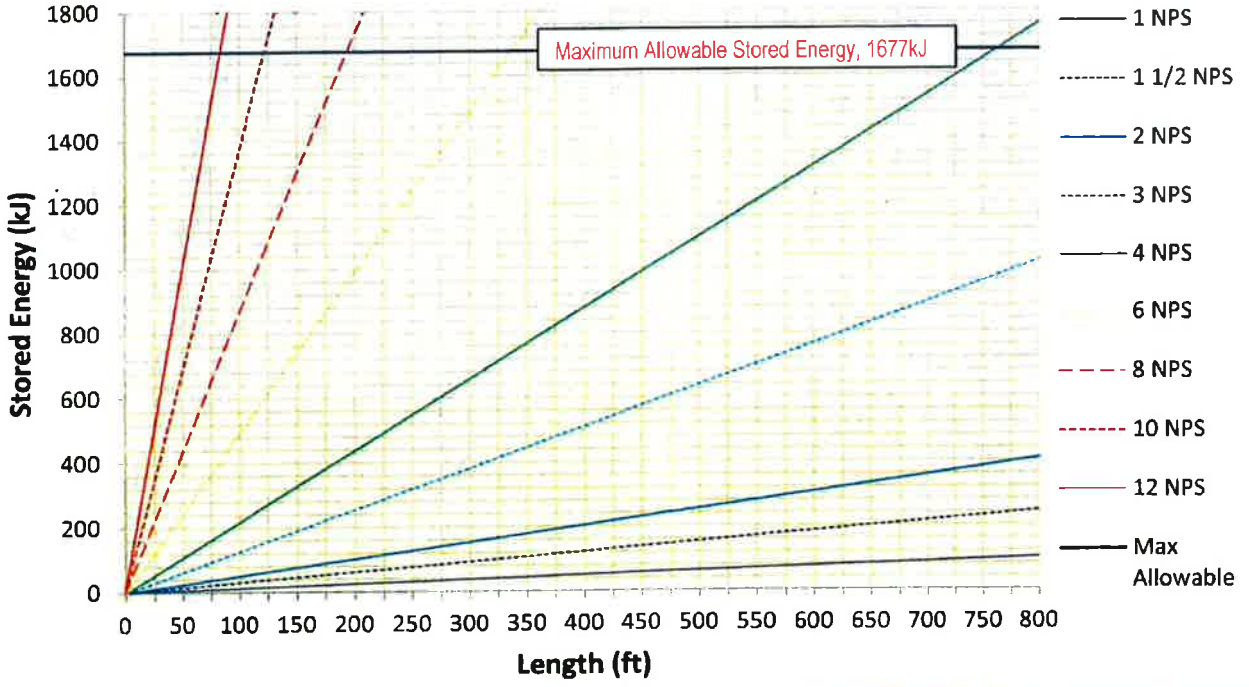
Quality Control

100 psi (690 kPa) Test Procedure

CRIMTECH Services Ltd

Client	Husky Energy	Test Number:	P1378-5 (Project Number – Seq)
Project Description:	Large water transfer skids	Test Date:	10/24/2012 (MM/DD/YYYY)
Calculation Completed By:	Caleb Egler		CSN 11438

Stored Energy at 100 PSI



To calculate the stored energy of pipework use the following steps:

1. Find the required length of pipe on the X axis (along the bottom of the graph).
2. Move up the graph to the correct pipe size (NPS).
3. Look across to the Y axis (the left side of the graph) and read the stored energy.
4. Record the stored energy in the table to the right.
5. Repeat steps 1 to 4 for all pipe sizes to be tested.
6. Add the stored energy for each NPS in the table to find the total stored energy to be tested.
7. If the total stored energy is under 1677 kJ the test may be carried out using WP-04-0494-CS Pneumatic Strength Test for ASME Pipework.
8. If the total stored energy is over 1677 kJ DO NOT CONDUCT TEST. Consult Engineering Department for alternative test.

Stored Energy Calculation Table

	NPS	Length of Pipe (ft)	Stored Energy (kJ) from graph
1	3"	8 ½	10 KJ
2	2"	23 ½	6 KJ
3	1"	4 ½	2 KJ
4			
5			
6			
7			
8			
9			
10			
Total Stored Energy =		18	kJ

Note:

1. All lines sizes based on schedule 40 pipe wall thicknesses.
2. Use the 1 NPS line for piping and tubing sizes less than 1 NPS.

Pneumatic Test Report

Quality Control

CRIMTECH Services Ltd

Client:	Husky Energy	Test Number:	P1378-4 (Project Number - Seq)
Project Description:	Large Water Transfer Unit	Test Date:	10/11/2012 (MM/DD/YYYY)
Test Location:	Crimtech Shop	Package CSN:	11439
Number of Spools in Test:	N/A	Number of Spools Recorded:	N/A

Piping Spool S/N's:

Stored Energy Determined by:

☐ Engineering Report attached

☑ Stored Energy Calculation Worksheet attached

Total Stored Energy: 18 kJ

Pressure Test Preparation	Shop (Initials)	QC (Initials)
Area secured, flagged off, signs up, barracades & safety cages considered. Barricade set-back 30 m (100 ft) unless safety cages or alternate method used (i.e. inside a building)	CE	✓
Does the client have their own pressure test specifications to follow (ie. gauge calibration dates 6 or 12 months, dead weight gauge required)	CE.	✓
Test pressure matches drawings (pressure gauges to be between 1.5 and 4 times the test pressure)	CE	✓
Pressure test equipment calibrations verified	CE	✓
Hoses, fittings, gauges suitable for test pressure and in good repair	CE	✓
Valves opened halfway	CE.	✓

Test Conducted By:	Cory Swanson	Test Medium:	☑ Air ☐ Nitrogen
Test Gauge No's:	New gauges on Skid	Chart Recorder No.:	N/A
Test Pressure:	690 ☐ PSI ☑ kPa	Holding Time at Test Pressure: (Minimum 10 minutes)	15 minutes min.

Step No.	1	2	3	4	5	6	7	8	9	10
Pressure										
Hold Time (min)										

Test Results: All Connections were sprayed with Snoop ® Liquid Leak Dector solution or equivalent. There were no visible leaks at the time of test. All functions correct.

Pneumatic Test Verification:

Pressure Test Code: ☐ ASME ☒ CSA ☐ ATMS ☒ other

☐ N/A	K. Finnovitis (Client Representative Name)	(Signature)	Date: Oct 11/12 (MM/DD/YYYY)
☐ N/A	Kaylon Clement (Crimtech QC Inspector Name)	(Signature)	Date: 10/11/12 (MM/DD/YYYY)
☒ N/A	(Authorized Inspector Name)	(Signature)	Date: (MM/DD/YYYY)

Stored Energy Calculation Worksheet

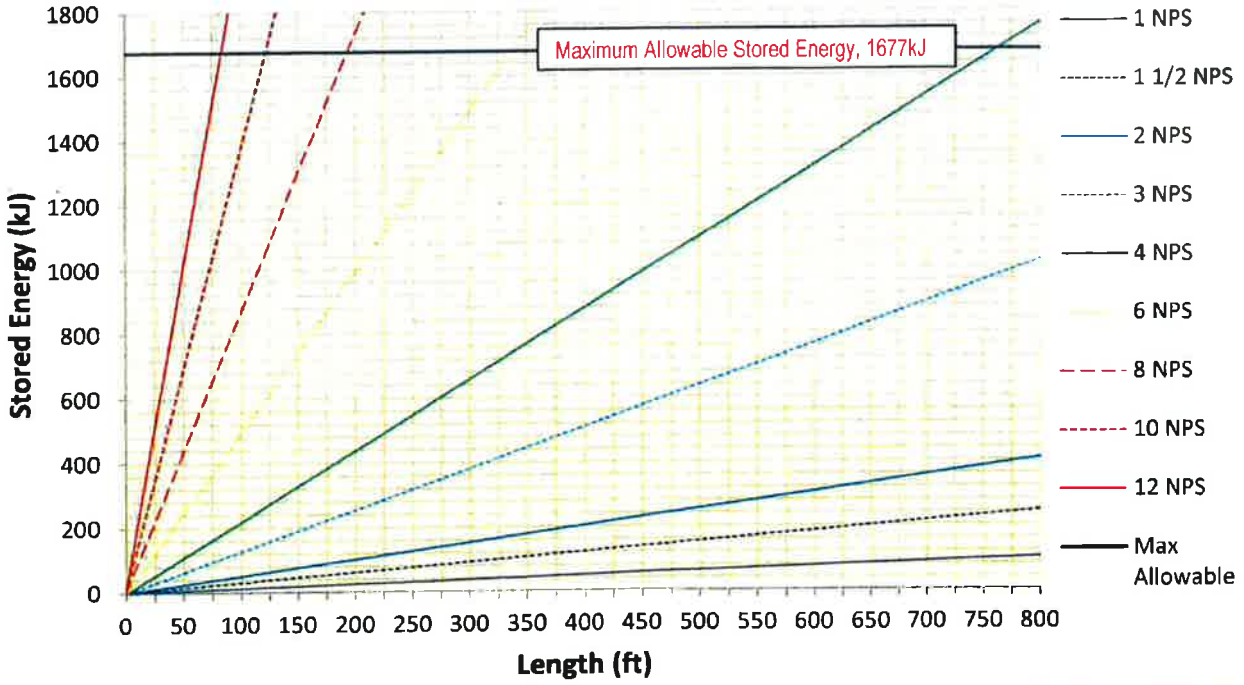
Quality Control

100 psi (690 kPa) Test Procedure

CRIMTECH Services Ltd

Client	Husky Energy	Test Number:	P1378-5 (Project Number – Seq)
Project Description:	Large water transfer skids	Test Date:	10/24/2012 (MM/DD/YYYY)
Calculation Completed By:	Caleb Engler		CSN 11439

Stored Energy at 100 PSI



To calculate the stored energy of pipework use the following steps:

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2. Move up the graph to the correct pipe size (NPS).
3. Look across to the Y axis (the left side of the graph) and read the stored energy.
4. Record the stored energy in the table to the right.
5. Repeat steps 1 to 4 for all pipe sizes to be tested.
6. Add the stored energy for each NPS in the table to find the total stored energy to be tested.
7. If the total stored energy is under 1677 kJ the test may be carried out using WP-04-0494-CS Pneumatic Strength Test for ASME Pipework.
8. If the total stored energy is over 1677 kJ DO NOT CONDUCT TEST. Consult Engineering Department for alternative test.

Stored Energy Calculation Table

	NPS	Length of Pipe (ft)	Stored Energy (kJ) from graph
1	3"	8 ½	10 KJ
2	2"	23 ½	6 KJ
3	1"	4 ½	2 KJ
4			
5			
6			
7			
8			
9			
10			
Total Stored Energy =		18	kJ

Note:

1. All lines sizes based on schedule 40 pipe wall thicknesses.
2. Use the 1 NPS line for piping and tubing sizes less than 1 NPS.

Pneumatic Test Report

Quality Control

CRIMTECH Services Ltd

Client:	Husky Energy	Test Number:	PM3378-4 (Project Number - Seq)
Project Description:	Large Water Transfer unit	Test Date:	10/11/2012 (MM/DD/YYYY)
Test Location:	Crimtech Shop	Package CSN:	11440
Number of Spools in Test:	NA	Number of Spools Recorded:	NA

Piping Spool S/N's:

Stored Energy Determined by:
- ☐ Engineering Report attached
- ☑ Stored Energy Calculation Worksheet attached

Total Stored Energy: 18 kJ

Pressure Test Preparation	Shop (Initials)	QC (Initials)
Area secured, flagged off, signs up, barracades & safety cages considered. Barricade set-back 30 m (100 ft) unless safety cages or alternate method used (i.e. inside a building)	CE.	
Does the client have their own pressure test specifications to follow (ie. gauge calibration dates 6 or 12 months, dead weight gauge required)	CE.	
Test pressure matches drawings (pressure gauges to be between 1.5 and 4 times the test pressure)	CE.	
Pressure test equipment calibrations verified	CE.	
Hoses, fittings, gauges suitable for test pressure and in good repair	CE.	
Valves opened halfway	CE.	

Test Conducted By:	Cory Swanson	Test Medium: ☑ Air ☐ Nitrogen	
Test Gauge No's:	New gauges on skid	Chart Recorder No.:	NA
Test Pressure: 690	☐ PSI ☑ kPa	Holding Time at Test Pressure: (Minimum 10 minutes)	15 minutes min.

Step No.	1	2	3	4	5	6	7	8	9	10
Pressure										
Hold Time (min)										

Test Results: All Connections were sprayed with Snoop ® Liquid Leak Dector solution or equivalent. There were no visible leaks at the time of test. All functions correct.

Pneumatic Test Verification:

Pressure Test Code: ☐ ASME ☒ CSA ☐ ATMS ☒ other

☐ N/A	K. Fiennytus (Client Representative Name)	(Signature)	Date: oct 11/12 (MM/DD/YYYY)
☐ N/A	Kaylon Clement (Crimtech QC Inspector Name)	(Signature)	Date: 10/11/12 (MM/DD/YYYY)
☒ N/A	(Authorized Inspector Name)	(Signature)	Date: (MM/DD/YYYY)

Stored Energy Calculation Worksheet

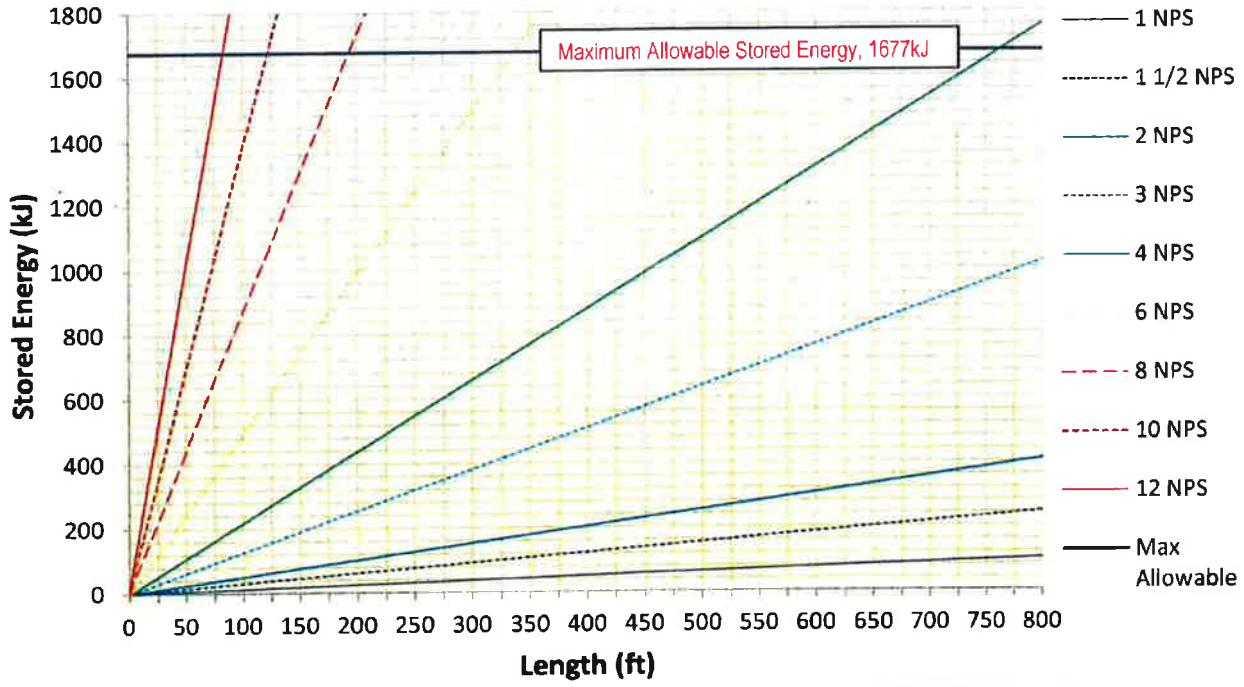
Quality Control

100 psi (690 kPa) Test Procedure

CRIMTECH Services Ltd

Client	Husky Energy	Test Number:	P1378-5 (Project Number – Seq)
Project Description:	Large water transfer skids	Test Date:	10/24/2012 (MM/DD/YYYY)
Calculation Completed By:	Caleb Engler		CSN 11440

Stored Energy at 100 PSI



To calculate the stored energy of pipework use the following steps:

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2. Move up the graph to the correct pipe size (NPS).
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5. Repeat steps 1 to 4 for all pipe sizes to be tested.
6. Add the stored energy for each NPS in the table to find the total stored energy to be tested.
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8. If the total stored energy is over 1677 kJ DO NOT CONDUCT TEST. Consult Engineering Department for alternative test.

Stored Energy Calculation Table

	NPS	Length of Pipe (ft)	Stored Energy (kJ) from graph
1	3"	8 ½	10 KJ
2	2"	23 ½	6 KJ
3	1"	4 ½	2 KJ
4			
5			
6			
7			
8			
9			
10			
Total Stored Energy =		18	kJ

Note:

1. All lines sizes based on schedule 40 pipe wall thicknesses.
2. Use the 1 NPS line for piping and tubing sizes less than 1 NPS.

Pneumatic Test Report

Quality Control

CRIMTECH Services Ltd

Client:	Husky Energy	Test Number:	P1378-4 (Project Number - Seq)
Project Description:	Large Water Transfer Unit	Test Date:	10/11/2012 (MM/DD/YYYY)
Test Location:	Crimtech Shop	Package CSN:	11441
Number of Spools in Test:	N/A	Number of Spools Recorded:	N/A

Piping Spool S/N's:

Stored Energy Determined by:

- ☐ Engineering Report attached
- ☑ Stored Energy Calculation Worksheet attached

Total Stored Energy: 18 kJ

Pressure Test Preparation	Shop (Initials)	QC (Initials)
Area secured, flagged off, signs up, barracades & safety cages considered. Barricade set-back 30 m (100 ft) unless safety cages or alternate method used (i.e. inside a building)	CE.	
Does the client have their own pressure test specifications to follow (ie. gauge calibration dates 6 or 12 months, dead weight gauge required)	CE.	
Test pressure matches drawings (pressure gauges to be between 1.5 and 4 times the test pressure)	CE.	
Pressure test equipment calibrations verified	CE.	
Hoses, fittings, gauges suitable for test pressure and in good repair	CE.	
Valves opened halfway	CE.	

Test Conducted By: Cory Swanson

Test Medium: ☒ Air ☐ Nitrogen

Test Gauge No's: New gauges on skid

Chart Recorder No.: N/A

Test Pressure: 690 ☐ PSI ☑ kPa

Holding Time at Test Pressure: 15 minutes min. (Minimum 10 minutes)

Step No.	1	2	3	4	5	6	7	8	9	10
Pressure										
Hold Time (min)										

Test Results: All Connections were sprayed with Snoop ® Liquid Leak Dector solution or equivalent. There were no visible leaks at the time of test. All functions correct.

Pneumatic Test Verification:

Pressure Test Code: ☐ ASME ☒ CSA ☐ ATMS ☒ other ~~N/A~~

☐ N/A	K. Fundytus (Client Representative Name)	(Signature)	Date: Oct 11/12 (MM/DD/YYYY)
☐ N/A	Krayton Clement (Crimtech QC Inspector Name)	(Signature)	Date: 10/11/12 (MM/DD/YYYY)
☒ N/A	(Authorized Inspector Name)	(Signature)	Date: (MM/DD/YYYY)

Stored Energy Calculation Worksheet

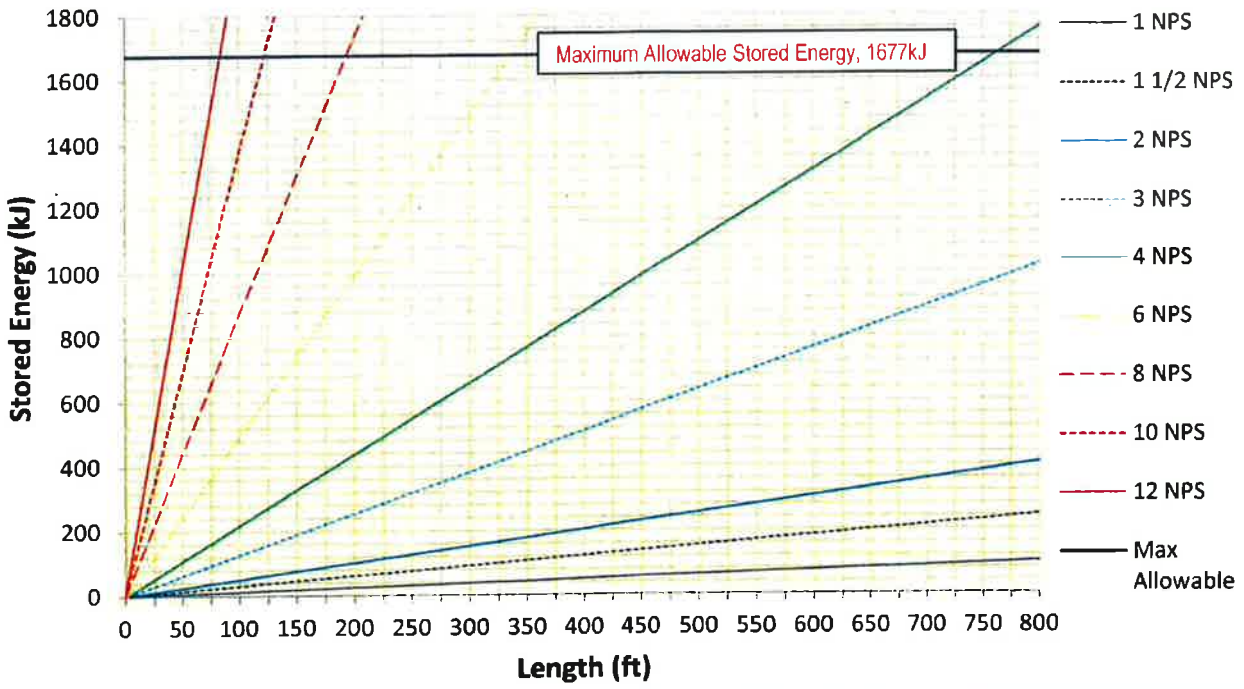
Quality Control

100 psi (690 kPa) Test Procedure

CRIMTECH Services Ltd

Client	Husky Energy	Test Number:	P1378-5 (Project Number – Seq)
Project Description:	Large water transfer skids	Test Date:	10/24/2012 (MM/DD/YYYY)
Calculation Completed By:	Caleb Engler		CSN 11443

Stored Energy at 100 PSI



To calculate the stored energy of pipework use the following steps:

1. Find the required length of pipe on the X axis (along the bottom of the graph).
2. Move up the graph to the correct pipe size (NPS).
3. Look across to the Y axis (the left side of the graph) and read the stored energy.
4. Record the stored energy in the table to the right.
5. Repeat steps 1 to 4 for all pipe sizes to be tested.
6. Add the stored energy for each NPS in the table to find the total stored energy to be tested.
7. If the total stored energy is under 1677 kJ the test may be carried out using WP-04-0494-CS Pneumatic Strength Test for ASME Pipework.
8. If the total stored energy is over 1677 kJ DO NOT CONDUCT TEST. Consult Engineering Department for alternative test.

Stored Energy Calculation Table

	NPS	Length of Pipe (ft)	Stored Energy (kJ) from graph
1	3"	8 ½	10 KJ
2	2"	23 ½	6 KJ
3	1"	4 ½	2 KJ
4			
5			
6			
7			
8			
9			
10			
Total Stored Energy =		18	kJ

Note:

1. All lines sizes based on schedule 40 pipe wall thicknesses.
2. Use the 1 NPS line for piping and tubing sizes less than 1 NPS.

TEAM Industrial Services
ISO 9001: 2000
Inspection Services Canada

RADIOGRAPHIC EXAMINATION REPORT

2507 - 84 Avenue, Edmonton, Alberta T6P 1K1
Phone (780) 417-7777 Fax: (780) 417-1185

RT - 3530-04 - CL

CLIENT: Crimtech Services Ltd. INVOICE ADDRESS: #45, 27429 TWP RD. 374, Red Deer County, AB T4S 2H4 DATE: 5-Apr-12

WORK LOCATION: Crimtech Shop Red Deer TEAM PROCEDURE: RT.CSA.EDM.2 R4

EXAMINATION STANDARD: CSA Z662-11 ACCEPTANCE STANDARD: ASME B31.3 Normal (2010)

EXAMINATION OF: Husky Energy piping (batch 4)

TEAM JOB NO. 3530
BRANCH: Red Deer
PROJ. NO.: P1378-4
PAGE: 1 OF 2

DEFECT LEGEND:			
IF - INCOMPLETE FUSION	S - SLAG	IC - INTERNAL CONCAVITY	CR - CRACK
IP - INCOMPLETE PENETRATION	BT - BURN THROUGH	LC - LOW COVER	AB - ARC BURN
EP - EXCESSIVE PENETRATION	SH - SHRINKAGE	HB - HOLLOW BEAD	FM - FILM MARK
UC - UNDERCUTTING	P - POROSITY	HB - HOLLOW BEAD	

TECHNIQUES	
EXPOSURE	VIEWING
1. SINGLE WALL	3. SINGLE WALL
2. DOUBLE WALL	4. DOUBLE WALL

TYPE OF ENERGY: Ir192 INTENSIFYING SCREENS: 0.005"/0.010" Pb FILM MANUFACTURER: AGFA
PHYSICAL SIZE: 4.2mm FILM PER CASSETE: 1
IQI TYPE: DIN Wire WELD MATERIAL: P1

RADIOGRAPH IDENTIFICATION				RADIOGRAPH GEOMETRY									RADIOGRAPH RESULTS		
WELD ID	SERIAL NO.	WELD SIZE	WELDER	TECHNIQUE	EXPOSURES PER WELD	WELD DEPOSIT THICKNESS	BASE MATERIAL THICKNESS	REINFORCE THICKNESS	SOURCE-OBJECT DISTANCE	OBJECT-FILM DISTANCE	FILM TYPE	IQI SIZE	INTERPRETATION	COMMENTS	STATUS
X1	24765	3"	M	2/3	3	8.0mm	5.5mm	2.5mm	80.9mm	8.0mm	D4	10-16			Accept
X2	24765	3"	M	2/3	3	8.0mm	5.5mm	2.5mm	80.9mm	8.0mm	D4	10-16			Accept
X3	24792	3"	M	2/3	3	8.0mm	5.5mm	2.5mm	80.9mm	8.0mm	D4	10-16			Accept
X4	24792	3"	M	2/3	3	8.0mm	5.5mm	2.5mm	80.9mm	8.0mm	D4	10-16			Accept
X5	24775	3"	A	2/3	3	8.0mm	5.5mm	2.5mm	80.9mm	8.0mm	D4	10-16			Accept
X6	24775	3"	A	2/3	3	8.0mm	5.5mm	2.5mm	80.9mm	8.0mm	D4	10-16			Accept
X7	24802	3"	A	2/3	3	8.0mm	5.5mm	2.5mm	80.9mm	8.0mm	D4	10-16			Accept
X8	24802	3"	A	2/3	3	8.0mm	5.5mm	2.5mm	80.9mm	8.0mm	D4	10-16			Accept
X9	24767	2"	C	2/3	3	6.4mm	3.9mm	2.5mm	53.9mm	6.4mm	D4	10-16			Accept
X10	24767	2"	C	2/3	3	6.4mm	3.9mm	2.5mm	53.9mm	6.4mm	D4	10-16			Accept
X11	24785	2"	C	2/3	3	6.4mm	3.9mm	2.5mm	53.9mm	6.4mm	D4	10-16			Accept
X12	24785	2"	C	2/3	3	6.4mm	3.9mm	2.5mm	53.9mm	6.4mm	D4	10-16			Accept
X13	24768	2"	M	2/3	3	6.4mm	3.9mm	2.5mm	53.9mm	6.4mm	D4	10-16			Accept
X14	24768	2"	M	2/3	3	6.4mm	3.9mm	2.5mm	53.9mm	6.4mm	D4	10-16	S(1) @5cm		Accept
X15	24795	2"	M	2/3	3	6.4mm	3.9mm	2.5mm	53.9mm	6.4mm	D4	10-16			Accept
X16	24795	2"	M	2/3	3	6.4mm	3.9mm	2.5mm	53.9mm	6.4mm	D4	10-16	CR/IF @9cm		Reject
X17	24769	2"	A	2/3	3	6.4mm	3.9mm	2.5mm	53.9mm	6.4mm	D4	10-16			Accept
X18	24769	2"	A	2/3	3	6.4mm	3.9mm	2.5mm	53.9mm	6.4mm	D4	10-16			Accept
X19	24787	2"	K	2/3	3	6.4mm	3.9mm	2.5mm	53.9mm	6.4mm	D4	10-16			Accept
X20	24787	2"	A	2/3	3	6.4mm	3.9mm	2.5mm	53.9mm	6.4mm	D4	10-16			Accept
X21	24779	2"	A	2/3	3	6.4mm	3.9mm	2.5mm	53.9mm	6.4mm	D4	10-16			Accept
X22	24779	2"	A	2/3	3	6.4mm	3.9mm	2.5mm	53.9mm	6.4mm	D4	10-16			Accept
X23	24779	2"	K	2/3	3	6.4mm	3.9mm	2.5mm	53.9mm	6.4mm	D4	10-16			Accept
X24	24797	2"	A	2/3	3	6.4mm	3.9mm	2.5mm	53.9mm	6.4mm	D4	10-16	P(1) @4, 7, 9cm		Accept
X25	24797	2"	A	2/3	3	6.4mm	3.9mm	2.5mm	53.9mm	6.4mm	D4	10-16			Accept
X26	24797	2"	K	2/3	3	6.4mm	3.9mm	2.5mm	53.9mm	6.4mm	D4	10-16			Accept
X27	24771	2"	A	2/3	3	6.4mm	3.9mm	2.5mm	53.9mm	6.4mm	D4	10-16			Accept
X28	24771	2"	A	2/3	3	6.4mm	3.9mm	2.5mm	53.9mm	6.4mm	D4	10-16			Accept
X29	24789	2"	A	2/3	3	6.4mm	3.9mm	2.5mm	53.9mm	6.4mm	D4	10-16			Accept
X30	24789	2"	A	2/3	3	6.4mm	3.9mm	2.5mm	53.9mm	6.4mm	D4	10-16		Root Profile	Accept

INTERPRETATION IS IN ACCORDANCE WITH THE ABOVE MENTIONED STANDARD, TO THE BEST OF MY PROFESSIONAL ABILITY

TECHNICIAN (PRINT): Charles Lasouski TECHNICIAN (SIGN): CGSB/SNT LEVEL: II/II REG NO. 11295 ASSISTANT: Craig Olsen

THE ABOVE REPRESENTATION IS A PROFESSIONAL OPINION, FINAL INTERPRETATION IS THE RESPONSIBILITY OF THE CLIENT. I HAVE REVIEWED AND AM IN FULL AGREEMENT WITH THE CONTENTS OF THIS REPORT.

CLIENT REPRESENTATIVE (PRINT): CLIENT REPRESENTATIVE (SIGN): DATE:

Crimtech QC Dept.
APR 09 2012
KELLY GATES, QCI

A021 RE R1

TEAM Industrial Services
Inspection Services Canada
ISO 9001: 2000

RADIOGRAPHIC CONTINUATION REPORT

2507 - 84 Avenue, Edmonton, Alberta T6P 1K1
Phone (780) 417-7777 Fax: (780) 417-1185

RT - 3530-04 - CL

CLIENT: Crimtech Services Ltd. INVOICE ADDRESS: #45, 27429 TWP RD. 374, Red Deer County, AB T4S 2H4 DATE: 5-Apr-12

WORK LOCATION: Crimtech Shop Red Deer

EXAMINATION OF: Husky Energy piping (batch 4)

TEAM JOB NO. 3530
BRANCH: Red Deer
PAGE: 2 OF 2

RADIOGRAPH IDENTIFICATION				RADIOGRAPH GEOMETRY									RADIOGRAPH RESULTS		
WELD ID	LOCATION	WELD SIZE	WELDER(S)	TECHNIQUE	EXPOSURES PER WELD	WELD DEPOSIT THICKNESS	BASE MATERIAL THICKNESS	REINFORCE THICKNESS	SOURCE-OBJECT DISTANCE	OBJECT-FILM DISTANCE	FILM TYPE	IQI SIZE	INTERPRETATION	COMMENTS	STATUS
X31	24790	2"	A	2/3	3	6.4mm	3.9mm	2.5mm	53.9mm	6.4mm	D4	10-16			Accept
X32	24790	2"	A	2/3	3	6.4mm	3.9mm	2.5mm	53.9mm	6.4mm	D4	10-16	IP(1) @14cm		Accept
X33	24773	2"	K	2/3	3	6.4mm	3.9mm	2.5mm	53.9mm	6.4mm	D4	10-16			Accept
X34	24773	2"	M	2/3	3	6.4mm	3.9mm	2.5mm	53.9mm	6.4mm	D4	10-16	P(1) @14cm		Accept
X35	24791	2"	M	2/3	3	6.4mm	3.9mm	2.5mm	53.9mm	6.4mm	D4	10-16			Accept
X36	24791	2"	M	2/3	3	6.4mm	3.9mm	2.5mm	53.9mm	6.4mm	D4	10-16			Accept
X37	24791	2"	M	2/3	3	6.4mm	3.9mm	2.5mm	53.9mm	6.4mm	D4	10-16			Accept
X38	24809	2"	M	2/3	3	6.4mm	3.9mm	2.5mm	53.9mm	6.4mm	D4	10-16			Accept
X39	24809	2"	M	2/3	3	6.4mm	3.9mm	2.5mm	53.9mm	6.4mm	D4	10-16			Accept
X16R	24795	2"	M	2/3	1	6.4mm	3.9mm	2.5mm	53.9mm	6.4mm	D4	10-16			Accept
X16T1	24804	2"	M	2/3	3	6.4mm	3.9mm	2.5mm	53.9mm	6.4mm	D4	10-16	S(1) @4cm		Accept
X16T2	24804	2"	M	2/3	3	6.4mm	3.9mm	2.5mm	53.9mm	6.4mm	D4	10-16			Accept

INTERPRETATION IS IN ACCORDANCE WITH THE ABOVE MENTIONED STANDARD, TO THE BEST OF MY PROFESSIONAL ABILITY

TECHNICIAN (PRINT): Charles Lasouski TECHNICIAN (SIGN): CGSB/SNT LEVEL: II/II REG NO. 11295 ASSISTANT: Craig Olsen

THE ABOVE REPRESENTATION IS A PROFESSIONAL OPINION, FINAL INTERPRETATION IS THE RESPONSIBILITY OF THE CLIENT. I HAVE REVIEWED AND AM IN FULL AGREEMENT WITH THE CONTENTS OF THIS REPORT.

CLIENT REPRESENTATIVE (PRINT): CLIENT REPRESENTATIVE (SIGN): DATE:

Crimtech QC Dept.
APR 09 2012
KELLY GATES, QCI

A021 RE R1

TEAM Industrial Services
ISO 9001: 2000 Inspection Services Canada

2507 - 84 Avenue, Edmonton, Al. . T6P 1K1
Phone (780) 417-7777 Fax: (780) 417-1185

MAGNETIC PARTICLE EXAMINATION REPORT

MT - 3530 - 06-CL

CLIENT: **Crimtech Services Ltd.** DATE: **2-Apr-12** PAGE: 1 OF 1

INVOICE ADDRESS: #45, 27429 TWP RD. 374, Red Deer, AB T4S 2H4 WORK LOCATION: Crimtech Shop - Red Deer

EXAMINATION STANDARD: CSA W59-03 R4 + ASTM E 709-08 ACCEPTANCE STANDARD: CSA W59-03 R4

TEAM PROCEDURE: MT.CSA.EDM.1 R3 EXAMINATION OF: Husky Energy skid lifting lug repairs

TEAM JOB NO.:	3530
BRANCH NO.:	Red Deer
PROJ. NO.:	P1378-4

SURFACE CONDITION: ☐ AS GROUND ☐ MACHINED ☐ PAINTED ☐ SHOT BLAST ☐ BASE METAL ☑ AS WELDED

TEMPERATURE: 15 °C

TEST EQUIPMENT AND MATERIALS:

EQUIPMENT	MODEL AND SERIAL NO.	CURRENT	TEST MEDIUM	MANUFACTURER /BATCH NO./CONCENTRATION
☑ EM YOKE	Contour Probe B300	☑ AC	☑ WET VISIBLE	Chemtal 8031 #32111507
☐ PERM. MAGNET		☐ DC	☐ DRY POWDER	
☐ BENCH		☑ CONTINUOUS	☑ CONTRAST PAINT	Chemtal 8901W 651627
☑ WHITE LIGHT	LED Head Light 3 AA cell	☐ RESIDUAL	☐ WET FLUORESCENT	
☐ BLACKLIGHT				

BLACK LIGHT INTENSITY BEFORE EXAMINATION: µw/CM² BLACK LIGHT INTENSITY AFTER EXAMINATION: µw/CM² WHITE LIGHT/BACKGROUND: 200fc min.

Wet/Black Magnetic Particle Inspection was performed on Husky Energy skid lifting lug fillet welds.
Five skids with four lugs per skid (20 total) were inspected.

Three lugs had rejectable porosity/pinhole type indications.

Rejectable lug fillet welds are in need of repair and re-inspection before final acceptance is given.

TECHNICIANS

A026 MPE R0

INTERPRETATION IS IN ACCORDANCE WITH THE ABOVE MENTIONED STANDARDS, TO THE BEST OF MY PROFESSIONAL ABILITY

(PRINT): Charles Lasouski CGSB/SNT LEVEL: II/II REG. NO.: 11295 (SIGN):

(PRINT): Craig Olsen CGSB/SNT LEVEL: #N/A REG. NO.: #N/A (SIGN):

THE ABOVE REPRESENTATION IS A PROFESSIONAL OPINION. FINAL INTERPRETATION IS THE RESPONSIBILITY OF THE CLIENT. I HAVE READ AND AM IN FULL AGREEMENT WITH THE CONTENTS OF THIS REPORT.

CLIENT REPRESENTATIVE: (PRINT): (SIGN):

Crimtech QC Dept.
APR 0 3 2012
KELLY GATES, QCI

Britany

TEAM Industrial Services
ISO 9001: 2000 Inspection Services Canada

MAGNETIC PARTICLE EXAMINATION REPORT

2507 - 84 Avenue, Edmonton, A. . T6P 1K1
Phone (780) 417-7777 Fax: (780) 417-1185

MT - 3530 - 07-CL

CLIENT: Crimtech Services Ltd. DATE: 5-Apr-12 PAGE: 1 OF 1

INVOICE ADDRESS: #45, 27429 TWP RD. 374, Red Deer, AB T4S 2H4 WORK LOCATION: Crimtech Shop - Red Deer

EXAMINATION STANDARD: CSA W59-03 R4 + ASTM E 709-08 ACCEPTANCE STANDARD: CSA W59-03 R4

TEAM PROCEDURE: MT.CSA.EDM.1 R3 EXAMINATION OF: Husky Energy skid lifting lug repairs

TEAM JOB NO.:	3530
BRANCH NO.:	Red Deer
PROJ. NO.:	P1378-4

SURFACE CONDITION: ☐ AS GROUND ☐ MACHINED ☐ PAINTED ☐ SHOT BLAST ☑ BASE METAL ☑ AS WELDED

TEMPERATURE: 15 °C

TEST EQUIPMENT AND MATERIALS:

EQUIPMENT	MODEL AND SERIAL NO.	CURRENT	TEST MEDIUM	MANUFACTURER /BATCH NO./CONCENTRATION
☑ EM YOKE	Contour Probe B300	☑ AC	☑ WET VISIBLE	Chemtal 8031 #32111507
☐ PERM. MAGNET		☐ DC	☐ DRY POWDER	
☐ BENCH		☑ CONTINUOUS	☑ CONTRAST PAINT	Chemtal 8901W 651627
☑ WHITE LIGHT	LED Head Light 3 AA cell	☐ RESIDUAL	☐ WET FLUORESCENT	
☐ BLACKLIGHT				

BLACK LIGHT INTENSITY BEFORE EXAMINATION: µw/CM² BLACK LIGHT INTENSITY AFTER EXAMINATION: µw/CM² WHITE LIGHT/BACKGROUND: 200fc min.

Wet/Black Magnetic Particle Inspection was performed on Husky Energy skid lifting lug fillet weld repairs.

No relevant indications remained on lug fillet welds.

All welds are in accordance with the examination/acceptance standard.

TECHNICIANS

INTERPRETATION IS IN ACCORDANCE WITH THE ABOVE MENTIONED STANDARDS, TO THE BEST OF MY PROFESSIONAL ABILITY

(PRINT): Charles Lasouski CGSB/SNT LEVEL: II/II REG. NO.: 11295 (SIGN):

(PRINT): Craig Olsen CGSB/SNT LEVEL: #N/A REG. NO.: #N/A (SIGN):

A026 MPE R0

THE ABOVE REPRESENTATION IS A PROFESSIONAL OPINION. FINAL INTERPRETATION IS THE RESPONSIBILITY OF THE CLIENT. I HAVE READ AND AM IN FULL AGREEMENT WITH THE CONTENTS OF THIS REPORT.

CLIENT REPRESENTATIVE: (PRINT): (SIGN):

Crimtech QC Dept.
APR 09 2012
KELLY GATES, QCI

Page 4

Natural Resources Canada

Ressources naturelles Canada

Name/ Nom: Charles R. Hallett

Rec. No. / No. matricule: 11295

Issue Date/ Date d'emission: 2009/11/23

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

Signature

Natural Resources Canada

Ressources naturelles Canada

Qualified to: a) CAN CGSB-48.9712 — 11295
b) ISO 20807 Qualifié selon

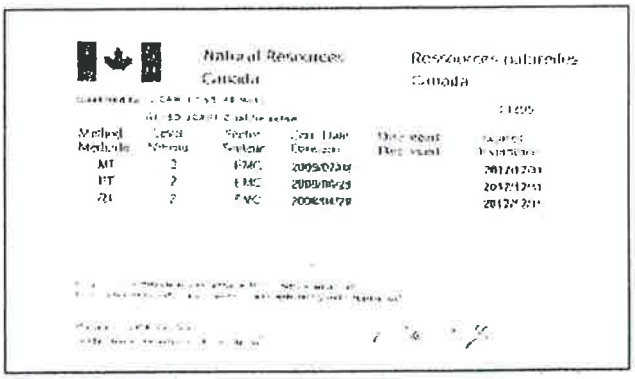
Method Methode	Level Niveau	Sector Secteur	Cert. Date Date cert.	Date recert. Date recert.	Expires Expiration
MT	2	EMC	2009/07/08		2012/12/31
PT	2	EMC	2009/06/25		2012/12/31
RT	2	EMC	2009/04/28		2012/12/31

TEAM® Industrial Services
Inspection Services Canada

CRIMTECH SERVICES LTD.
RECEIVED
Aug 31, 2012

CERTIFICATIONS FOR CHARLES (HALLETT) LASOUSKI

C.G.S.B. CERTIFICATION



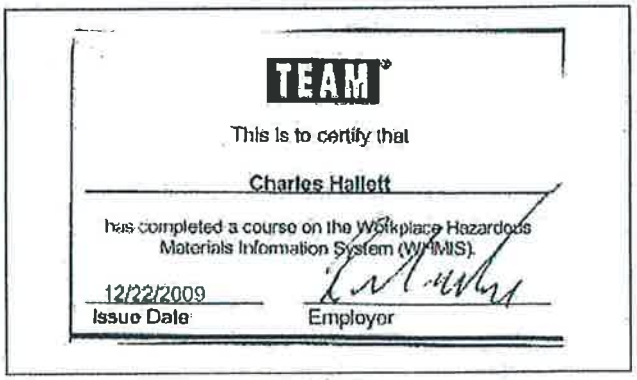
C.G.S.B. QUALIFICATIONS

Charles R. Lasouski
Is certified in accordance with 33.G.103-S1 in the following:

METHOD	LEVEL	DATE	EXPIRATION	LIMITATIONS
MT	II	6/4/2010	12/31/2012	
PT	II	6/4/2010	12/31/2012	
RT	II	6/4/2010	12/31/2012	

VAR DUE: 5/4/2012
TEAM®
Corporate Level III

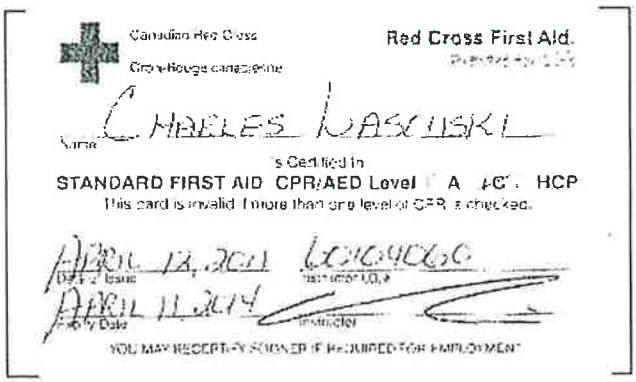
SNT-TC-1A CERTIFICATION



WHMIS

Alberta Construction Safety Association
This is to certify that
CHARLES HALLETT
met the requirements and has successfully completed the
Construction Safety Training System
"CSTS Ver. 3.2" includes Generic WHMIS
Reg. #
2020805
Issue Date: 09/2009
Brent Schneider Program Coordinator, ACSA

C.S.T.S.



FIRST AID

TEAM® Industrial Services
Inspection Services Canada

CERTIFICATIONS FOR CHARLES (HALLETT) LASOUSKI

TDG CLASS 7 TRAINING CERTIFICATE

Charles Lasouski has completed the training required by the Transportation of Dangerous Goods Regulations.

Employer: Team Industrial Services

Employer's address: 6579 - 52 Ave

Issued on (date): November 24, 2011

Expires on: November 24, 2014 (maximum 3 years)

Employer's signature:

Employer's signature:

Details of training are listed on reverse.

TDG

DETAILS OF TRAINING

This employee has completed Danatec's computer based TDG Training Program, which covers the following topics of training for transportation of dangerous goods by road for Class 7 Dangerous Goods which are classified as Type B Packages.

- Responsibilities (Shipper, Handler, Carrier)
- Hazards of Class 7
- Shipping Names and UN Numbers
- Shipping Documents
- Safety Marks
- Containers
- Special Situations
- Emergency Actions

Additional details or topics of training:

Topic	Date	Employer's Signature

Certificate No. 176830

www.danatec.com
1-800-465-3366

TDG

ENFORM

059469 Temporary Certificate No.

H_2S Alive®

Charles Lasouski

has successfully completed the Enform H_2S Alive® course

DO NOT PHOTOCOPY

H2S ALIVE

FORM

Warm the letters 'EN' with breath. It will temporarily fade if certificate is authentic.

April 6, 2011 — Course Date

266855 — Course Number

Pat Pumell — H_2S Alive Instructor

H_2S Alive Instructor No. 750316

H_2S Alive Instructor Signature

H2S ALIVE

Wheels On

CHARLES LASOUSKI

has completed CONFINED SPACE ENTRY RESCUE

Date: April 7, 2011
Expires On: April 6, 2014

Signature of Trainer

CONFINED SPACE

Wheels On

CHARLES LASOUSKI

has completed a training program in Industrial Fall Protection and Prevention in accordance with Occupational Health and Safety

Team Industrial Services
6579 - 52 Ave
Red Deer, AB T4N 4L2

Date: April 26, 2011
Expires On: April 25, 2014

Signature of Trainer

FALL PROTECTION

TEAM® Industrial Services
Inspection Services Canada

CERTIFICATIONS FOR CHARLES (HALLETT) LASOUSKI

Husky Energy – Proof of Orientation

NAME: Charles Hallett

ISSUED: March 1, 2010
EXPIRES: March 1, 2013
CATEGORY: Field

TransCanada

Certificate of Completion | Field Contractor | LR#1509

Congratulations!

You have successfully completed your Health, Safety and Environment Safety Orientation.

Name: Charles Hallett

Completion Date: 2009-09-25

Expiration Date: 2011-09-25

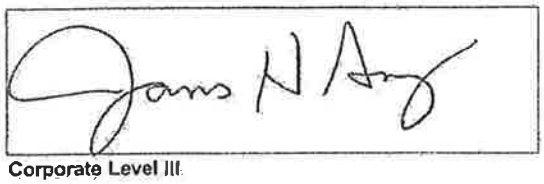
TEAM® Industrial Services
Personnel Qualification and Certification

Employee Name: Charles R. Lasouski Employee ID#: 669699

Vision Acuity Expiration Date: 5/2/2013

METHOD	LEVEL	DATE CERTIFIED	EXPIRATION DATE	GENERAL SCORE	SPECIFIC SCORE	PRACTICAL SCORE	COMPOSITE SCORE %	EXPERIENCE HOURS	TRAINING HOURS	LIMITED TO	COMMENTS
MT	II	6/4/2010	12/31/2012	80	80	98	86	2680	40		CGSB Card # 11295
PT	II	6/4/2010	12/31/2012	80	80	93.5	84.5	1120	40		CGSB Card # 11295
RT	II	6/4/2010	12/31/2012	80	80	96	85.3	7580	120		CGSB Card # 11295

The above named individuals qualification history has been reviewed and found to be acceptable IAW TISI's requirements for certification; 33.G.103-S1, SNT-TC-1A-2006 and earlier editions (1992 and 2001), as published by the American Society for Nondestructive Testing and any additional certification standards listed in the comments section above.

Certifier's Signature: 

Date: 5/9/2012

Corporate Level III
James H. Amy

TEAM	Quality System Supplement Corporate	FORM 103.10 Rev: 6 Page 1 of 1

VISION ACUITY RECORD

Name: Charles Lasouski Employee #: 669699

Vision Acuity Results

Near Vision Requirements
Required for All Personnel

	Left Eye	Right Eye
Uncorrected	J-1 @ 15"	J-1 @ 15"
Corrected	J- @ "	J- @ "

☒ Satisfactory Near Vision (J-1 minimum required in at least one eye)

☐ Unsatisfactory Near Vision

☐ Corrective Lenses Required (J-1 requirement in at least one eye met with use of corrective lenses)

☐ Reading card has been verified IAW 8.1.2.1 of 33.G.103-S8 for personnel certifying to 33.G.103-S4 (CP-189/ASME XI)

Distance Vision Requirements
Branch is Required to Determine Applicability

	Left Eye		Right Eye	
Uncorrected	20/	Snellen	20/	Snellen
Corrected	20/	Snellen	20/	Snellen

☐ Satisfactory Distance Vision (20/30 Snellen minimum required in at least one eye.

☐ Unsatisfactory Distance Vision

☐ Corrective Lenses Required (20/30 Snellen requirement in at least one eye met with use of corrective lenses)

☒ N/A (Branch determined non-applicable by Code or contractual agreements)

Color Vision Requirements

Required for All Personnel

(Use Form 103.10a "Color Vision Examination Charts")

☒ Can differentiate between colors or shades of gray used in method(s)

☐ Cannot differentiate between colors or shades of gray used in method(s)

☒ Satisfactory ☐ Unsatisfactory ☐ Corrective Lenses Required

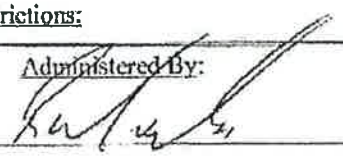
Deficiencies: None

Brightness Discrimination Requirements

Branch is Required to Determine Applicability

☒ N/A ☐ Satisfactory ☐ Unsatisfactory ☐ Corrective Lenses Required

Remarks/Restrictions:

Administered By:		Reviewed & Approved By:	
Signature:		☒ NDT Level III Signature: ☐ Resp. Level 3 Signature	
Name:	Randy Machan	☒ NDT Level III Name: ☐ Resp. Level 3 Name:	Stan Banner
Location:	Red Deer	Date:	May 2/2012
Date:	May 2/2012	Next Examination Date:	May 2/2013

CSN11437

Endress+Hauser

People for Process Automation

Flow Calibration with Adjustment

30226011-2725742

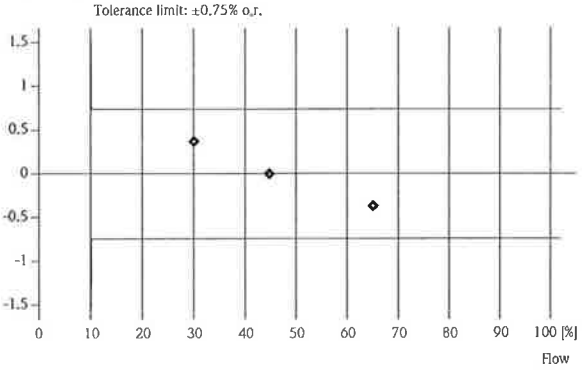
3003250812	FCP-6.F
Purchase order number	Calibration rig
CA-3004788346-20 / Endress+Hauser Flowtec	66.15811 us.gal/min (≙ 100%)
Order N°/Manufacturer	Calibrated full scale
72F25-SM0AA8PAB4AA	Service interface
Order code	Calibrated output
PROWIRL 72 F 1"	79.341 Imp./dm³
Transmitter/Sensor	Calibration factor
F206A116000	78.2 °F
Serial N°	Water temperature
FQIT-100	
Tag N°	

Flow [%]	Flow [us.gal/min]	Duration [s]	V target [us.gal]	V meas. [us.gal]	Δ o.r.* [%]	Outp.** [mA]
29.9	19.8	30.2	9.9617	9.9990	0.37	8.81
44.7	29.6	30.2	14.881	14.881	0.00	11.15
65.1	43.1	30.2	21.673	21.591	-0.37	14.38
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

*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 Information (TI), chapter Performance characteristics.

The calibration is traceable to the N.I.S.T. through standards certified at preset intervals.

Endress+Hauser Flowtec operates ISO/IEC 17025 accredited calibration facilities in Reinach (CH), Cernay (FR), Greenwood (USA), Aurangabad (IN) and Suzhou (CN).

Scott Newcomer

02-23-2012
Date of calibration

S. Newcomer
Operator

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

Certified acc. to
ISO 9001, Reg.-N° 030502.2
ISO 14001, Reg.-N° EMS561046

Endress+Hauser

People for Process Automation

CSN11438

Flow Calibration with Adjustment

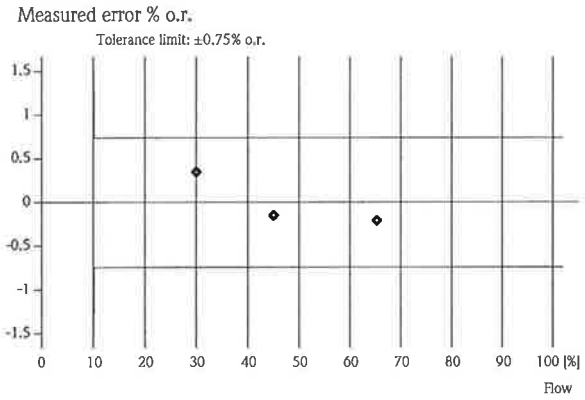
30226194-2725743

3003250812 Purchase order number	FCP-6.F Calibration rig
CA-3004788346-20 / Endress+Hauser Flowtec Order N°/Manufacturer	66.15811 us.gal/min (≙ 100%) Calibrated full scale
72F25-SM0AA8PAB4AA Order code	Service interface Calibrated output
PROWIRL 72 F 1" Transmitter/Sensor	80.148 Imp./dm³ Calibration factor
F206A216000 Serial N°	80.9 °F Water temperature
FQIT-100 Tag N°	

Flow [%]	Flow [us.gal/min]	Duration [s]	V target [us.gal]	V meas. [us.gal]	Δ o.r.* [%]	Outp.** [mA]
30.0	19.8	30.2	9.9666	10.002	0.35	8.81
44.8	29.7	30.2	14.926	14.904	-0.15	11.16
65.2	43.1	30.2	21.695	21.650	-0.21	14.41
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

*o.r.: of rate

**Calculated value (4 - 20 mA)



For detailed data concerning output specifications of the unit under test, see Technical Information (TI), chapter Performance characteristics.

The calibration is traceable to the N.I.S.T. through standards certified at preset intervals.

Endress+Hauser Flowtec operates ISO/IEC 17025 accredited calibration facilities in Reinach (CH), Cernay (FR), Greenwood (USA), Aurangabad (IN) and Suzhou (CN).

Scott Newcomer

02-24-2012

Date of calibration

S. Newcomer

Operator

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

Certified acc. to
ISO 9001, Reg.-N° 030502.2
ISO 14001, Reg.-N° EMS561046

Endress+Hauser

People for Process Automation

CSN11439

Flow Calibration with Adjustment

30226021-2725740

3003250812
Purchase order number

CA-3004788346-20 / Endress+Hauser Flowtec
Order N°/Manufacturer

72F25-SM0AA8PAB4AA
Order code

PROWIRL 72 F 1"
Transmitter/Sensor

F2069F16000
Serial N°

FQIT-100
Tag N°

FCP-6.F
Calibration rig

66.15811 us.gal/min (≙ 100%)
Calibrated full scale

Service interface
Calibrated output

79.467 Imp./dm³
Calibration factor

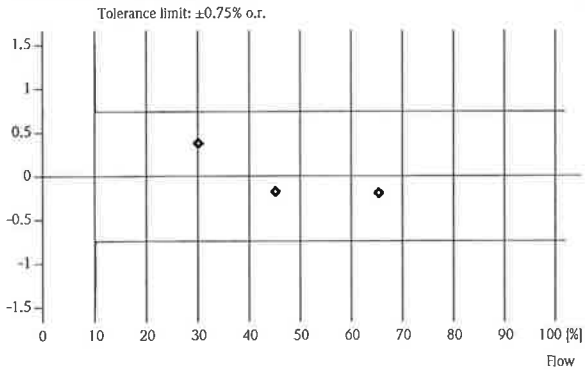
79.7 °F
Water temperature

Flow [%]	Flow [us.gal/min]	Duration [s]	V target [us.gal]	V meas. [us.gal]	Δ o.r.* [%]	Outp.** [mA]
30.0	19.8	30.2	9.9820	10.020	0.38	8.82
45.0	29.8	30.2	14.969	14.942	-0.18	11.18
65.3	43.2	30.2	21.726	21.682	-0.20	14.42
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

*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 Information (TI), chapter Performance characteristics.

The calibration is traceable to the N.I.S.T. through standards certified at preset intervals.

Endress+Hauser Flowtec operates ISO/IEC 17025 accredited calibration facilities in Reinach (CH), Cernay (FR), Greenwood (USA), Aurangabad (IN) and Suzhou (CN).

Scott Newcomer

02-23-2012
Date of calibration

S. Newcomer
Operator

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

Certified acc. to
ISO 9001, Reg.-N° 030502.2
ISO 14001, Reg.-N° EMS561046

Endress+Hauser

People for Process Automation

CSN11440

Flow Calibration with Adjustment

30226015-2725744

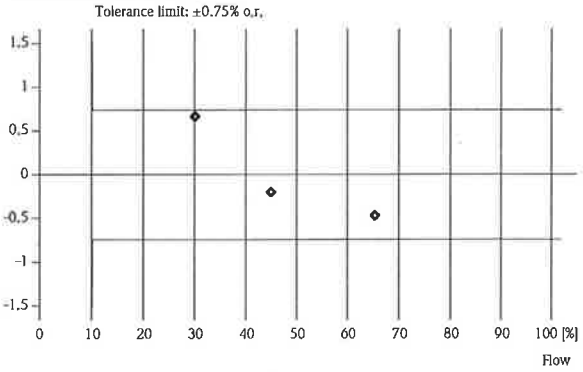
3003250812 Purchase order number	FCP-6.F Calibration rig
CA-3004788346-20 / Endress+Hauser Flowtec Order N°/Manufacturer	66.15811 us.gal/min (≙ 100%) Calibrated full scale
72F25-SM0AA8PAB4AA Order code	Service interface Calibrated output
PROWIRL 72 F 1" Transmitter/Sensor	80.154 Imp./dm³ Calibration factor
F206A316000 Serial N°	78.6 °F Water temperature
FQIT-100 Tag N°	

Flow [%]	Flow [us.gal/min]	Duration [s]	V target [us.gal]	V meas. [us.gal]	Δ o.r.* [%]	Outp.** [mA]
30.0	19.8	30.2	9.9825	10.050	0.67	8.83
44.9	29.7	30.2	14.933	14.903	-0.20	11.16
65.4	43.3	30.2	21.760	21.657	-0.47	14.41
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

*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 Information (TI), chapter Performance characteristics.

The calibration is traceable to the N.I.S.T. through standards certified at preset intervals.

Endress+Hauser Flowtec operates ISO/IEC 17025 accredited calibration facilities in Reinach (CH), Cernay (FR), Greenwood (USA), Aurangabad (IN) and Suzhou (CN).

Scott Newcomer

02-23-2012
Date of calibration

S. Newcomer
Operator

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

Certified acc. to
ISO 9001, Reg.-N° 030502.2
ISO 14001, Reg.-N° EMS561046

Endress+Hauser

People for Process Automation

CSN11441

Flow Calibration with Adjustment

30226024-2725746

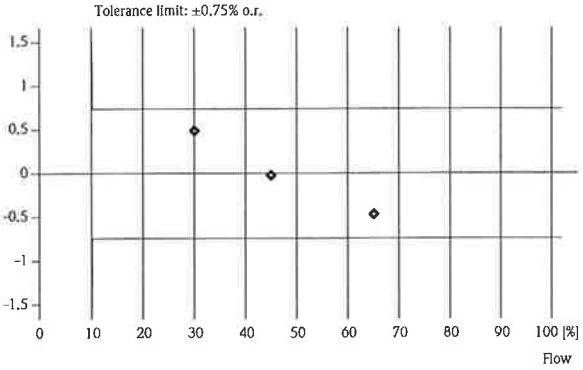
3003250812 Purchase order number	FCP-6.F Calibration rig
CA-3004788346-20 / Endress+Hauser Flowtec Order N°/Manufacturer	66.15811 us.gal/min (≙ 100%) Calibrated full scale
72F25-SM0AA8PAB4AA Order code	Service interface Calibrated output
PROWIRL 72 F 1" Transmitter/Sensor	80.316 Imp./dm³ Calibration factor
F206A516000 Serial N°	79.9 °F Water temperature
FQIT-100 Tag N°	

Flow [%]	Flow [us.gal/min]	Duration [s]	V target [us.gal]	V meas. [us.gal]	Δ o.r.* [%]	Outp.** [mA]
29.9	19.8	30.2	9.9666	10.016	0.49	8.81
44.9	29.7	30.2	14.953	14.950	-0.02	11.19
65.1	43.1	30.2	21.667	21.566	-0.47	14.37
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

*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 Information (TI), chapter Performance characteristics.

The calibration is traceable to the N.I.S.T. through standards certified at preset intervals.

Endress+Hauser Flowtec operates ISO/IEC 17025 accredited calibration facilities in Reinach (CH), Cernay (FR), Greenwood (USA), Aurangabad (IN) and Suzhou (CN).

Scott Newcomer

02-23-2012
Date of calibration

S. Newcomer
Operator

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

Certified acc. to
ISO 9001, Reg.-N° 030502.2
ISO 14001, Reg.-N° EMS561046

Petker Coatings Ltd

QUALITY CONTROL REPORT

PETKER PROJECT #13-001 PHASE 2

CRIMTECH SERVICES LTD

CRIMTECH PROJECT #P1378

HUSKY PIPE SPOOLS S/N 24720-24809

INTERNAL COATING

May 4, 2012

SUBMITTED BY: ALEX HARPER

Petker Coatings Ltd

PROJECT #13-001 PHASE 2 - INTERNAL PIPE/SPOOL COATING INSPECTION REPORT

Date: May 4, 2012 | **Project #**: 13-001 Phase 2 | **Client**: Crimtech Services Ltd

P.O #: 144278 | **Pipe Size**: 2", 3" | **Quantity:** 90 spools

Contact: Stacy Gheseger | **S/N:** 24720-24809

Surface Preparation Inspection

Date: April 23, 2012 | **Blast Standard:** SSPC SP5 White Metal

Abrasive: Sil Silica #7 Sand | **Surface Profile:** 3.1 – 3.3 mils

Surface Temperature: 75F | **Ambient Temperature**: 72F

Relative Humidity: 26% | **Welds:** Fair

Comments: Blast inspection was done in conjunction with Pro Inspection Ltd.

Coating Application – First Coat

Date: April 23, 2012 | **Coating Material**: Devchem 268 white

Base Batch no: APV11C31034 | **Catalyst Batch no:** HU1A63730

Surface Temperature: 75F | **Ambient Temperature:** 72F

Relative Humidity: 26% | **Application Equipment:** Conventional – Lance

Coating Thickness Readings: 2.0 – 4.5 mils; readings taken on April 24, 2012.

Coating Application – Second Coat

Date: April 24, 2012 | **Coating Material**: Devchem 268 white

Base Batch no: APV11C31034 | **Catalyst Batch no:** HU1A63730

Surface Temperature: 73F | **Ambient Temperature:** 73F

Relative Humidity: 30% | **Application Equipment:** Conventional – Lance

Coating Thickness Readings: 4.5 – 8.0 mils; readings taken on April 25, 2012.

Petker Coatings Ltd

PROJECT #13-001 Phase 2 - INTERNAL PIPE/SPOOL COATING INSPECTION REPORT

Coating Application – Third Coat

Date: April 25, 2012

Coating Material: Devchem 268 white

Base Batch no: APV11C31034

Catalyst Batch no: HU1A63730

Surface Temperature: 71F

Ambient Temperature: 72F

Relative Humidity: 32%

Application Equipment: Conventional – Lance

Coating Thickness Readings: 8.0 – 11.5 mils; readings taken on April 26, 2012.

Coating Application – Fourth Coat

Date: April 26, 2012

Coating Material: Devchem 268 white

Base Batch no: APV11C31034

Catalyst Batch no: HU1A63730

Surface Temperature: 71F

Ambient Temperature: 72F

Relative Humidity: 31%

Application Equipment: Conventional - Lance

Final Coating Inspection

Date: April 30, 2012

Specified DFT: 10 – 14 mils DFT

Coating Thickness Readings: 10 – 18.5 mils
Average: 13.0 mils

Holiday Inspection Method: Wet Sponge 67.5 V

No. of Holidays: Zero

Holiday Repair Method: Devmat 142C

Cure Monitored: Yes, Heated Shop

Coating Accepted as Cured: May 1, 2012

Comments: Final Inspection was done in conjunction with Pro Inspection Ltd.

The pipe/spools listed in this report have met the specifications and requirements of the purchaser and are hereby released for shipment from the referenced coating facility.

Inspected By: Alex Harper

Date Shipped: May 4, 2012

Petker Coatings Ltd

QUALITY CONTROL REPORT

PETKER PROJECT #13-001 PHASE 2

CRIMTECH SERVICES LTD

CRIMTECH PROJECT #P1378

HUSKY PIPE SPOOLS S/N 2420-24809

EXTERNAL COATING

May 4, 2012

SUBMITTED BY: ALEX HARPER

Petker Coatings Ltd

PROJECT #13-01 PHASE 2 - EXTERNAL PIPE/SPOOL COATING INSPECTION REPORT

Date: May 4, 2012 | **Project #**: 13-001 Phase 2 | **Client**: Crimtech Services Ltd

P.O #: 144278 | **Pipe Size**: 2", 3" | **Quantity:** 90 spools

Contact: Stacy Gheseger | **S/N:** 24720-24809

Surface Preparation Inspection

Date: April 30, 2012 | **Blast Standard:** SSPC SP6 Commercial Blast

Abrasive: Sil Silica #7 Sand | **Surface Profile:** 2.8 – 3.1 mils

Surface Temperature: 72F | **Ambient Temperature**: 71F

Relative Humidity: 32%

Comments:

Coating Application – Prime Coat

Date: April 30, 2012 | **Coating Material**: Bar Rust 236

Base Batch no: HU1H75386 | **Catalyst Batch no:** 11G014

Surface Temperature: 72F | **Ambient Temperature:** 71F

Relative Humidity: 32% | **Application Equipment:** Airless Spray

Coating Thickness Readings: 3.0 – 6.5 mils; readings taken on May 1, 2012.

Coating Application – Top Coat

Date: May 1, 2012 | **Coating Material**: Devthane 349 Medium Grey

Base Batch no: HU1E68403 | **Catalyst Batch no:** 11C042

Surface Temperature: 71F | **Ambient Temperature:** 72F

Relative Humidity: 31% | **Application Equipment:** Conventional Spray

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Petker Coatings Ltd

PROJECT #13-001 PHASE 2 - EXTERNAL PIPE/SPOOL COATING INSPECTION REPORT

Final Coating Inspection

Date: May 2, 2012

Specified DFT: 5.0 – 8.0 mils DFT

Coating Thickness Readings: 6.0 – 10.0 mils

Cure Monitored: Yes, Heated Shop

Coating Accepted as Cured: May 4, 2012

Comments:

The pipe/spools listed in this report have met the specifications and requirements of the purchaser and are hereby released for shipment from the referenced coating facility.

Inspected By: Alex Harper

Date Shipped: May, 2012

PRODUCTS DIVISION
Quality Control Department
Surface Blast Inspection Report

CRIMTECH Services Ltd

Client: Husky		Report No.: D137 (Project No.)	(Sequence No.)
Client Control Number.: C4104327236	Date: 09 (Mo) 09 (Day) 12 (Yr)	Client Specifications:	PS-MW-05
Item(s) Description: Skid Unit x 5		Batch (42): 5	
Drawing Numbers: 1024021-ST-01			

PRE-BLAST INSPECTION

	Check List: Completed By Sandblaster:	Check List: Checked By Painter:	Comments
Drawings Read and Understood	MS	✓	
Paint Manufacturer Specifications Read and Understood	MS	✓	
Client Specifications Read & Understood	MS	✓	
Blast Profile Log Completed: YES ☑ NO ☐	MS	✓	If Yes, see attached Blast Profile Log
Skid & Piping Free of Oils, Scale, Debris	MS	✓	
All Sharp Edges Removed	MS	✓	
All Spatter / Slag Removed on Surfaces to be Coated	MS	✓	
Edge Radius per Specification	MS	✓	
Welds Smooth	MS	✓	

SURFACE PREPARATION

SSPC Required: SP6	Ambient Temperature: 20.3 °C
Abrasive Type: Red	Relative Humidity: 30.1 %
Blast Profile Required: Min: 1 Max:	Surface Temperature: 20.5 °C (average)
Number of Profile Tapes Used: 2	Weather Conditions (Pls. circle) Sunny, Raining, Windy, Snowing
Profile Tape Average: 2.9	Dew Point Temperature: 1.8 °C
	Wet Bulb Temperature: 11.8 °C

Comments:

Scott Mills (Print Name)	(QCI / Production Supervisor Signature)	Date: 04 (Mo) 09 (Day) 12 (Yr)
(Print Name)	(Client Representative Signature)	Date: (Mo) (Day) (Yr)
Kelly Gates (Print Name)	Kelly Gates (Quality Assurance Signature)	Date: 01 (Mo) 28 (Day) 13 (Yr)

PRODUCTS DIVISION
Quality Control Department
Surface Blast Profile Log

CRIMTECH Services Ltd

Client: Husky (End User)		Report No.: P1378 (Project No.)	(Sequence No.)
Client Control Number: 8400432736	Client Specifications: PS-MW-05	Date: 09 (Mo) 09 (Day) 12 (Year)	

Location Ref. No.:	Blast Profile Strip:	Reference Drawing No.
	Testex PRESS-O-FILM™ HT www.testextape.com X-Coarse 1.5 to 4.5 mil 38 to 115 µm Made in USA 3.0 C (C+XC)/2 XC 20 38 64 115 µm 0.8 1.5 2.5 4.5 mil	1024021-ST-01
	Testex PRESS-O-FILM™ HT www.testextape.com X-Coarse 1.5 to 4.5 mil 38 to 115 µm Made in USA 2.8 C (C+XC)/2 XC 20 38 64 115 µm 0.8 1.5 2.5 4.5 mil	1024021-ST-01

PRODUCTS DIVISION
Quality Control Department
Coating Inspection Report

CRIMTECH Services Ltd

☑ Primer Report ☐ Finish Coat Report

Client: Husky (End User) Report No.: 1378 Project No.

Client Control Number.: 8400432736. Date: 09 Mo 11 Day 12 Yr Client Specifications: PS-MW-05

Item(s) Painted Description: SKID UNIT X 145 Batch (4) - 5

Control/Dwg. Numbers: 1024021-ST-01 ~~Batch (3) - 1~~

System Conditions

Coating System: 236	Finish Color: WHITE	Ambient Temp.: 23.8 °C	Application Method:
Coating Mfg: DEVOE Coating		Relative Humidity: 34 %	Air Spray ☑ Airless ☐
A Component Batch No.: 456229009000-0075		Dew Point Temp.: 5.8 °C	Electrostatic ☐ Brush/Roller ☐
Coating Expiry Date: 2013.		Surface Temp.: 24.3 °C	Number of Coats Applied:
B Component Batch No.: 156222020002900		Paint Temp.: 24.5 °C	1 ☑ 2 ☐ 3 ☐ 4 ☐ 5 ☐
Coating Expiry Date: 2013 (0186)		Wet Bulb Temp.: 13.0 °C	

Wet Gauge Thickness Readings: 1. 8.0 mils 2. mils 3. mils

Required Dry Film Thickness Readings: Min: 4.0 mils Max: 6.0 mils

Measured Dry Film Thickness Readings

Location: VARIOUS	High: 6.0 mils	Low: 3.8 mils	Avg. 5.2 mils	# of Readings 20
Location:	High: mils	Low: mils	Avg. mils	# of Readings
Location:	High: mils	Low: mils	Avg. mils	# of Readings

Visual Inspection Comments:
- LIGHT TOUCH-UPS,

Repairs Completed:
Benchmarks ☐ Pinholes ☐ Debris ☐ Sags ☐
Lack of Coverage ☐ Drips ☐
Other Explain:

Scott McWhirter — Print Name — QCI / Production Supervisor Signature — Date: 09 Mo 12 Day 12 Yr

Print Name — Client Representative Signature — Date: Mo Day Yr

Kelly Gates — Print Name — Kelly Gates — Quality Assurance Signature — Date: 01 Mo 28 Day 13 Yr

PRODUCTS DIVISION
Quality Control Department
Coating Inspection Report

CRIMTECH Services Ltd

☐ Primer Report ☑ Finish Coat Report

Client: Husky (End User) Report No.: 1378 Project No.

Client Control Number: 8400432736 Date: 09 Mo 17 Day 12 Yr Client Specifications: PS-MW-05

Item(s) Painted Description: SKID PLATFORM SK #5 BATCH (4)-5

Control/Dwg. Numbers: 1024021-ST-01 ~~BATCH (5)~~

System Conditions

Coating System: 3490 c.c.	Finish Color: Grey Medium	Ambient Temp: 22.2 °C	Application Method:
Coating Mfg: DEVOE Coating	263	Relative Humidity: ~~25~~ %	Air Spray ☑ Airless ☐
A Component Batch No.: 456222070000357		Dew Point Temp.: 1.8 °C	Electrostatic ☐ Brush/Roller ☐
Coating Expiry Date: April 2014		Surface Temp.: 21.1 °C	Number of Coats Applied:
B Component Batch No.: 12EC14 00057		Paint Temp.: 22.3 °C	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐
Coating Expiry Date: April 2014		Wet Bulb Temp.: 11.7 °C	

Wet Gauge Thickness Readings: 1. / mils 2. / mils 3. / mils

Required Dry Film Thickness Readings: Min: ~~4~~ 6 mils Max: ~~6~~ 9 mils

Measured Dry Film Thickness Readings

Location: Various	High: 14.2 mils	Low: 7.1 mils	Avg: 9.4 mils	# of Readings 80
Location:	High: mils	Low: mils	Avg. mils	# of Readings
Location:	High: mils	Low: mils	Avg. mils	# of Readings

Visual Inspection Comments:

Repairs Completed:

Benchmarks ☐ Pinholes ☐ Debris ☐ Sags ☐
Lack of Coverage ☐ Drips ☐
Other Explain:

Scott McDabb (Print Name) — QCI / Production Supervisor Signature — Date: 09 Mo 18 Day 12 Yr

(Print Name) — Client Representative Signature — Date: Mo Day Yr

Kelly Gates (Print Name) — Kelly Gates (Quality Assurance Signature) — Date: 01 Mo 28 Day 13 Yr

PRODUCTS DIVISION
Quality Control Department
Surface Blast Inspection Report

CRIMTECH Services Ltd

Client: Husky		Report No.: P1378 (Project No.)	(Sequence No.)
Client Control Number.: 8400432736	Date: 04 (Mo) 13 (Day) 2012 (Yr)	Client Specifications:	PS-MW-05
Item(s) Description	Skid Unit x1	Grating x 57 pcs (Batches 1,2,3 & 4)	(Batch 1 & 5 left)
Drawing Numbers:	1024021-ST-01		

PRE-BLAST INSPECTION

	Check List: Completed By Sandblaster:	Check List: Checked By Painter:	Comments
Drawings Read and Understood	√	✓	
Paint Manufacturer Specifications Read and Understood	√	✓	
Client Specifications Read & Understood	√	✓	
Blast Profile Log Completed: YES ☑ NO ☐	√	✓	If Yes, see attached Blast Profile Log
Skid & Piping Free of Oils, Scale, Debris	√	✓	
All Sharp Edges Removed	√	✓	
All Spatter / Slag Removed on Surfaces to be Coated	√	✓	
Edge Radius per Specification	√	✓	
Welds Smooth	√	✓	

SURFACE PREPARATION

SSPC Required: SP-6	Ambient Temperature: 7.5 °C
Abrasive Type: #4	Relative Humidity: 35.2 %
Blast Profile Required: Min: 1 Max: 1	Surface Temperature: 9.4 °C (average)
Number of Profile Tapes Used: 3	Weather Conditions (Pls. circle) Sunny, Raining, Windy, Snowing
Profile Tape Average: 1.98	Dew Point Temperature: -6.9 °C
	Wet Bulb Temperature: 2.1 °C

Comments:

Scott McNabb (Print Name)	QCI / Production Supervisor Signature	Date: 04 (Mo) 13 (Day) 2013 (Yr)
(Print Name)	Client Representative Signature	Date: (Mo) (Day) (Yr)
Kelly Gates (Print Name)	Kelly Gates (Quality Assurance Signature)	Date: 09 (Mo) 13 (Day) 2013 (Yr)

PRODUCTS DIVISION
Quality Control Department
Surface Blast Profile Log

CRIMTECH Services Ltd

Client: Husky (End User)

Report No.: P1378 (Project No.) ____ (Sequence No.)

Client Control Number: 8400432 76

Client Specifications: PS-MW-05

Date: 04 (Mo) 23 (Day) 2012 (Year)

Location Ref. No.:	Blast Profile Strip:	Reference Drawing No.
07	Testex PRESS-O-FILM™ HT X-Coarse 1.5 to 4.5 mil 38 to 115 µm — 1.8	1024021-ST-01
04	Testex PRESS-O-FILM™ HT X-Coarse 1.5 to 4.5 mil 38 to 115 µm — 2.1	1024021-ST-01
14	Testex PRESS-O-FILM™ HT X-Coarse 1.5 to 4.5 mil 38 to 115 µm — 2.0	1024021-ST-01

PRODUCTS DIVISION
Quality Control Department
Coating Inspection Report

CRIMTECH Services Ltd

☑ Primer Report ☐ Finish Coat Report

Client: Husky (End User)

Report No.: P1378 (Project No.)

Client Control Number.: 8400432736

Date: 04 (Mo) 25 (Day) 2012 (Yr)

Client Specifications: PS-MW-05

Item(s) Painted Description: Skid Unit x1 (Grating Batches 1,2,3,4 x 57 pcs (Batch / skid)

Control/Dwg. Numbers: 1024021-ST-01

System Conditions

Coating System: Bar-Rust	Finish Color: Grey	Ambient Temp.: 18.4 °C	Application Method:
Coating Mfg: Devoe 236		Relative Humidity: 22.8 %	Air Spray ☐ Airless ☑
A Component Batch No.: HUIK 78974		Dew Point Temp.: -3.2 °C	Electrostatic ☐ Brush/Roller ☐
Coating Expiry Date: Oct 2013		Surface Temp.: 19.0 °C	Number of Coats Applied:
B Component Batch No.: HUIM 81160		Paint Temp.: 18.2 °C	1 ☑ 2 ☐ 3 ☐ 4 ☐ 5 ☐
Coating Expiry Date: Dec 2013		Wet Bulb Temp.: 8.6 °C	

Wet Gauge Thickness Readings: 1. / mils 2. / mils 3. / mils

Required Dry Film Thickness Readings: Min: 4.1 mils Max: 6 mils

Measured Dry Film Thickness Readings

Location: Various (wet)	High: 8.0 mils	Low: 3.0 mils	Avg. 5.1 mils	# of Readings 20
Location:	High: mils	Low: mils	Avg. mils	# of Readings
Location:	High: mils	Low: mils	Avg. mils	# of Readings

Visual Inspection Comments:

Repairs Completed:

Benchmarks ☐ Pinholes ☐ Debris ☐ Sags ☐
Lack of Coverage ☐ Drips ☐
Other Explain:

Scott McNabb (Print Name) — QCI / Production Supervisor Signature — Date: 04 (Mo) 25 (Day) 2012 (Yr)

(Print Name) — Client Representative Signature — Date: (Mo) (Day) (Yr)

Kelly Gates (Print Name) — Quality Assurance Signature — Date: 09 (Mo) 13 (Day) 2013 (Yr)

PRODUCTS DIVISION
Quality Control Department
Coating Inspection Report

CRIMTECH Services Ltd

☐ **Primer Report** ☑ **Finish Coat Report**

Client: Husky (End User) Report No.: P1378 (Project No.)

Client Control Number.: 840044732736 Date: 04 (Mo) 25 (Day) 2012 (Yr) Client Specifications: PS-MW-05

Item(s) Painted Description: Skid Unit x 2 Batches 1, 2, 3 & 4 Grating x 57 pcs. (Batch 1 x 2 skids)

Control/Dwg. Numbers: 1024021-ST-01

System Conditions

Coating System: Dev-thane	Finish Color: Grey	Ambient Temp.: 22.6 °C	Application Method:
Coating Mfg: Devoe 349 QC		Relative Humidity: 21.9 %	Air Spray ☐ Airless ☑
A Component Batch No.: HUIL 78837		Dew Point Temp.: -0.2 °C	Electrostatic ☐ Brush/Roller ☐
Coating Expiry Date: Nov 2013		Surface Temp.: 22.9 °C	Number of Coats Applied:
B Component Batch No.: 10M0270442		Paint Temp.: 20.3 °C	1 ☑ 2 ☐ 3 ☐ 4 ☐ 5 ☐
Coating Expiry Date: Nov 2013		Wet Bulb Temp.: 11.3 °C	

Wet Gauge Thickness Readings: 1. / mils 2. / mils 3. / mils

Required Dry Film Thickness Readings: Min: 6 mils Max: 9 mils

Measured Dry Film Thickness Readings

Location: Various	High: 11.6 mils	Low: 6.4 mils	Avg. 10.4 mils	# of Readings 20
Location:	High: mils	Low: mils	Avg. mils	# of Readings
Location:	High: mils	Low: mils	Avg. mils	# of Readings

Visual Inspection Comments:

Repairs Completed:

Benchmarks ☐ Pinholes ☐ Debris ☐ Sags ☐
Lack of Coverage ☐ Drips ☐
Other Explain:

Kelly Gates (Print Name)	Kelly Gates (QCI / Production Supervisor Signature)	Date: 05 (Mo) 11 (Day) 12 (Yr)
(Print Name)	(Client Representative Signature)	Date: (Mo) (Day) (Yr)
Kelly Gates (Print Name)	Kelly Gates (Quality Assurance Signature)	Date: 09 (Mo) 13 (Day) 2013 (Yr)

PRODUCTS DIVISION
Quality Control Department
Surface Blast Inspection Report

CRIMTECH Services Ltd

Client: Husky		Report No.: D/378 (Project No.)	(Sequence No.)
Client Control Number.: 4500473736	Date: 08 (Mo) 09 (Day) 12 (Yr)	Client Specifications:	PS-MW-05
Item(s) Description: Drain Piping x20 units		Batches 3,4,5&6	
Drawing Numbers: 1024/910 - PS-07, PS-08, PS-09			

PRE-BLAST INSPECTION

	Check List: Completed By Sandblaster:	Check List: Checked By Painter:	Comments
Drawings Read and Understood	MS	✓	
Paint Manufacturer Specifications Read and Understood	MS	✓	
Client Specifications Read & Understood	MS	✓	
Blast Profile Log Completed: YES ☑ NO ☐	MS	✓	If Yes, see attached Blast Profile Lo
Skid & Piping Free of Oils, Scale, Debris	MS	✓	
All Sharp Edges Removed	MS	✓	
All Spatter / Slag Removed on Surfaces to be Coated	MS	✓	
Edge Radius per Specification	MS	✓	
Welds Smooth	MS	✓	

SURFACE PREPARATION

SSPC Required: SP-10	Ambient Temperature: 18.4 °C
Abrasive Type: #4	Relative Humidity: 28.1 %
Blast Profile Required: Min: 1 Max:	Surface Temperature: 20.0 °C (average)
Number of Profile Tapes Used: 2	Weather Conditions (Pls. circle) Sunny, Raining, Windy, Snowi
Profile Tape Average:	Dew Point Temperature: 1.3 °C
	Wet Bulb Temperature: 10.2 °C

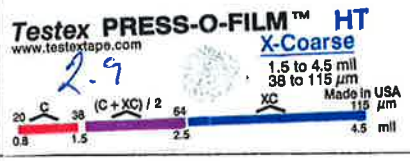
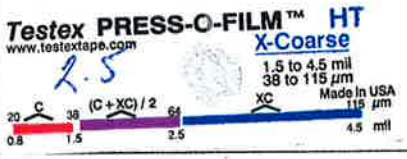
Comments:

Scott McNabb (Print Name)	(QCI / Production Supervisor Signature)	Date: 08 (Mo) 09 (Day) / (Y)
(Print Name)	(Client Representative Signature)	Date: (Mo) (Day) (Y)
Kelly Gates (Print Name)	Kelly Gates (Quality Assurance Signature)	Date: 01 (Mo) 28 (Day) 13 (Y)

PRODUCTS DIVISION
Quality Control Department
Surface Blast Profile Log

CRIMTECH Services Ltd

Client: Husky (End User)		Report No.: P1378 (Project No.)	(Sequence No.)
Client Control Number: 8400-132736	Client Specifications: PS-MW-05	Date: 08 (Mo) 09 (Day) 12 (Year)	

Location Ref. No.:	Blast Profile Strip:	Reference Drawing No.
		1024910 - PS-07
		1024910 - PS-08

PRODUCTS DIVISION
Quality Control Department
Coating Inspection Report

CRIMTECH Services Ltd

☒ Primer Report ☐ Finish Coat Report

Client: Husky (End User) Report No.: P1378 Project No.

Client Control Number.: 8400432736 Date: 08 (Mo) 09 (Day) 12 (Yr) Client Specifications: PS-MW-05

Item(s) Painted Description: Drain Piping x 20 UNITS Batches 3, 4, 5 & 6

Control/Dwg. Numbers: 1024910 - * PS-07, PS-08, PS-09.

System Conditions

Coating System: Bar Rust	Finish Color: Grey	Ambient Temp.: 21.0 °C	Application Method:
Coating Mfg: Devoe 236		Relative Humidity: 30.4%	Air Spray ☒ Airless ☐
A Component Batch No.: HOIM 81159		Dew Point Temp.: 1.2 °C	Electrostatic ☐ Brush/Roller ☐
Coating Expiry Date: Dec 2013		Surface Temp.: 22.1 °C	Number of Coats Applied:
B Component Batch No.: HOIH75313		Paint Temp.: 20.8 °C	1 ☐ 2 ☒ 3 ☐ 4 ☐ 5 ☐
Coating Expiry Date: Aug 2013		Wet Bulb Temp.: 13.4 °C	

Wet Gauge Thickness Readings: 1. / mils 2. / mils 3. / mils

Required Dry Film Thickness Readings: Min: 4 mils Max: / mils

Measured Dry Film Thickness Readings

Location: Various	High: 6.1 mils	Low: 2.8 mils	Avg. 5.3 mils	# of Readings 45
Location:	High: mils	Low: mils	Avg. mils	# of Readings
Location:	High: mils	Low: mils	Avg. mils	# of Readings

Visual Inspection Comments:

Repairs Completed:

Benchmarks ☐ Pinholes ☐ Debris ☐ Sags ☐
Lack of Coverage ☐ Drips ☐
Other Explain:

Scott McNabb (Print Name) _____ (QCI / Production Supervisor Signature) Date: 08 (Mo) 10 (Day) 12 (Yr)

_____ (Print Name) _____ (Client Representative Signature) Date: _____ (Mo) _____ (Day) _____ (Yr)

Kelly Gates (Print Name) Kelly Gates (Quality Assurance Signature) Date: 01 (Mo) 28 (Day) 13 (Yr)

PRODUCTS DIVISION
Quality Control Department
Coating Inspection Report

CRIMTECH Services Ltd

☐ Primer Report ☒ Finish Coat Report

Client: Husky (End User) Report No.: P1378 Project No.

Client Control Number.: 8400432736 Date: 08 Mo / 11 Day / 12 Yr Client Specifications: PS-MW-05

Item(s) Painted Description: Drain Piping x 20 Units Batches 3,4,5 & 6

Control/Dwg. Numbers: 1024910 - * PS-07, PS-08, PS-09 *

System Conditions

Coating System: Dextthane	Finish Color: Grey	Ambient Temp.: 26.1 °C	Application Method:
Coating Mfg: Devoe	349QC	Relative Humidity: 36 %	Air Spray ☒ Airless ☐
A Component Batch No.:	HUM 40721	Dew Point Temp.: 3 8 °C	Electrostatic ☐ Brush/Roller ☐
Coating Expiry Date:	Dec 2013	Surface Temp.: 26.0 °C	Number of Coats Applied:
B Component Batch No.:	11M0107 37	Paint Temp.: 25.5 °C	1 ☐ 2 ☒ 3 ☐ 4 ☐ 5 ☐
Coating Expiry Date:	Dec 2013	Wet Bulb Temp.: 18.9 °C	

Wet Gauge Thickness Readings: 1. / mils 2. / mils 3. / mils

Required Dry Film Thickness Readings: Min: 6 mils Max: 9 mils

Measured Dry Film Thickness Readings

Location: Various	High: 13.2 mils	Low: 5.1 mils	Avg. 8.4 mils	# of Readings 60
Location:	High: mils	Low: mils	Avg. mils	# of Readings
Location:	High: mils	Low: mils	Avg. mils	# of Readings

Visual Inspection Comments:

Repairs Completed:

Benchmarks ☐ Pinholes ☐ Debris ☐ Sags ☐
Lack of Coverage ☐ Drips ☐
Other Explain:

Scott McNabb (Print Name)	(QCI / Production Supervisor Signature)	Date: 08 Mo / 12 Day / 12 Yr	
(Print Name)	(Client Representative Signature)	Date: Mo / Day / Yr	
Kelly Gates (Print Name)	(Quality Assurance Signature)	Date: 01 Mo / 28 Day / 13 Yr	

WELDING PROCEDURE SPECIFICATION NO.: CRIM-10

WELDING PROCEDURE QUALIFICATION RECORD NO. (S): CRIM-10-1, CRIM-10-2,

QUALIFIED FOR

Base Metal (Typical): P1 Groups 1 & 2 to P1 Groups 1 & 2
(SA 333 Gr. 6, SA 350 Gr. LF2, SA 420 WPL6, SA 516 Gr. 70, etc.)

Process(es): GMAW / SMAW **Weld Types:** GROOVE & FILLET

Position: ALL POSITIONS **Diameter:** ALL DIAMETERS

Filler Metal: GMAW: ER70S-2 SMAW: E7018-1

BASE METAL CONDITIONS & GROOVE THICKNESS RANGE QUALIFIED:

NOTCH TOUGHNESS APPLICATIONS TO -46°C AS WELDED

BASE METAL THICKNESS RANGE 3.2 to 25.4 mm (0.125 to 1.00 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	23.1 mm (0.910 in.) maximum

ALBERTA BOILERS SAFETY ASSOCIATION
PROVINCE OF ALBERTA
SAFETY CODES ACT
WELDING PROCEDURE
Reg No. WP 1861.2
Spec No. CRIM-10
Weld Process GMAW / SMAW
Matl Gr. P No 1 Gr 1 1 2 to P No 1 Gr 1 1 2
Elec Gr F No 6 + 4 A No 1
Th. Qual For 3.2 to 25.4 mm PWHT NO
CVN - 46°C
Yr 07 Mo 06 Day 13 Signed
R. ROSEBERG, P.ENG.
WELDING SPECIALIST

PROVINCIAL REGISTRATION

Welders Log ASME for Pressure Vessels

Quality Control

CRIMTECH Services Ltd

Welder's Name/File Number	Symbol	Process /Method	Base Metals	Filler Metal "F" Number(s)	Backing	Minimum OD (in.)	Deposit Thickness	Positions	Uphill/ Downhill	Cored/ Solid	Insert	Backing Gas	GTAW Current	GMAW X-Fer	Expiry Date P.Q. Card MM/DD/YYYY
Wayne Cunnigham	K	SMAW	P1-P1	F3/F4	F3-W/WO F4- W	1.00"	F3-0.226" F4-MTBW	All	Uphill	N/A	N/A	N/A	N/A	N/A	9/13/2014
		GMAW/ SMAW	P1-P1	F6/F4	F6-W/WO F4-W	1.00"	F6-0.121" F4-0.449"	F6 0-45° F4 Flat	DownHill / N/A	N/A	N/A	N/A	N/A	Short Circuit	9/13/2014
		SAW	P1-P1	F6	WITH	2 7/8"	MTBW	FLAT	N/A	N/A	N/A	N/A	N/A	N/A	4/30/2013
		GMAW/ SMAW	P1-P1	F6/F4	F6-W/WO F4-W	2.87"	F6-0.121" F4-MTBW"	F6 Horiz. F4 Flat	N/A	N/A	N/A	N/A	N/A	Short Circuit	11/15/2012
Keith Murrant W-24742	M	GMAW/ SMAW	P1-P1	F6/F4	F6-W/WO F4-W	1.00"	F6-0.121" F4-0.450"	F6 0-45° F4 Flat	DownHill / N/A	N/A	N/A	N/A	N/A	Short Circuit	3/19/2014
		SMAW	P1-P1	F3/F4	F3 -W/WO F4-W	1.00"	F3-0.226" F4-MTBW	All	Uphill	N/A	N/A	N/A	N/A	N/A	3/19/2014
Keith Watchel W-15834	A	SMAW	P1-P1	F3/F4	F3-W/WO F4- W	1.00"	F3-0.226" F4-MTBW	All	Uphill	N/A	N/A	N/A	N/A	N/A	9/13/2014
		GMAW / SMAW	P1-P1	F6/F4	F6-W/WO F4-W	1.00"	F6-0.121" F4-0.450"	F6 0-45° F4 Flat	Downhill / N/A	N/A	N/A	N/A	N/A	Short Circuit	9/13/2014
		GMAW / SMAW	P8-P8, P1	F6/F5	F6-W/WO F5-W	1.00"	F6-0.121" F5-0.450"	F6 0-45° F5 Flat	Downhill / N/A	N/A	N/A	N/A	N/A	Modified Short Circuit	8/15/2014

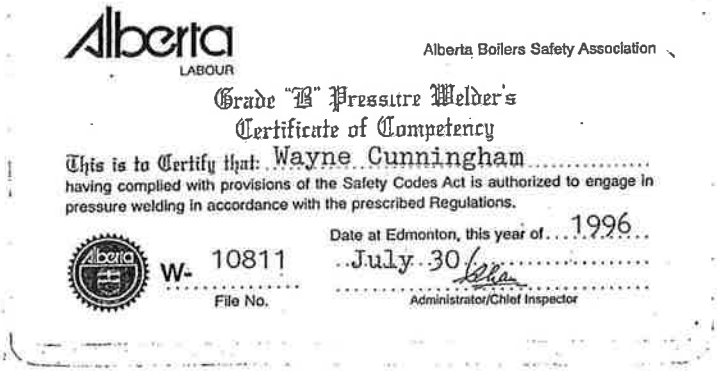
PRODUCTS DIVISION

Welder's Log Sheet (ASME B31.3)

CRIMTECH Services Ltd

Welder's Name/File Number	Symbol	Process /Method	Base Metals	Filler Metal "F" Number(s)	Backing	Minimum OD (in.)	Deposit Thickness	Positions	Uphill/ Downhill	Cored/ Solid	Insert	Backing Gas	GTAW Current	GMAW X-Fer	Expiry Date P.Q. Card MM/DD/YYYY
Brian Church W-19473	C	GMAW/ SMAW	P1-P1	F6/F4	F6-W/WO F4-W	1.00"	F6-0.121" F4-0.449"	F6 0-45° F4 Flat	N/A	N/A	N/A	N/A	N/A	Short Circuit	3/14/2013
		SMAW	P1-P1	F3/F4	F3-W/WO F4- W	1.00"	F3-0.226" F4-MTBW	All	Uphill	N/A	N/A	N/A	N/A	N/A	3/14/2013
		SAW	P1-P1	F6	WITH	2 7/8"	MTBW	FLAT	N/A	N/A	N/A	N/A	N/A	N/A	4/30/2013
		GMAW/ SMAW	P1-P1	F6/F4	F6-W/WO F4-W	2.87"	F6-0.121" F4-MTBW"	F6 Horiz. F4 Flat	N/A	N/A	N/A	N/A	N/A	Short Circuit	11/15/2012

WELDER ID: K



Alberta
LABOUR

Alberta Boilers Safety Association

Grade "B" Pressure Welder's
Certificate of Competency

This is to Certify that: Wayne Cunningham
having complied with provisions of the Safety Codes Act is authorized to engage in pressure welding in accordance with the prescribed Regulations.

Date at Edmonton, this year of 1996
July 30

W- 10811
File No.

Administrator/Chief Inspector

WELDER ID: K

CRIMTECH Services Ltd
22 McKenzie Drive
Red Deer County, AB T4S 2H4
7202
A.O.Q.P. NO.

WELDING PERFORMANCE QUALIFICATION CARD

Wayne Cunningham
(Name)

ABSA File No.

This card is issued pursuant to the Alberta Safety Codes Act and Pressure Welders' Regulations.
The performance qualification is in accordance with Section IX of the ASME Code and subject to the limitations on the reverse side.

Sept 13 2012
Date of Test

Signature of Welder or Machine Welding Operator

This performance qualification is valid for two years from the date of test unless extended inside the card.

Kyla Conway
Welding Examiner (print/type)

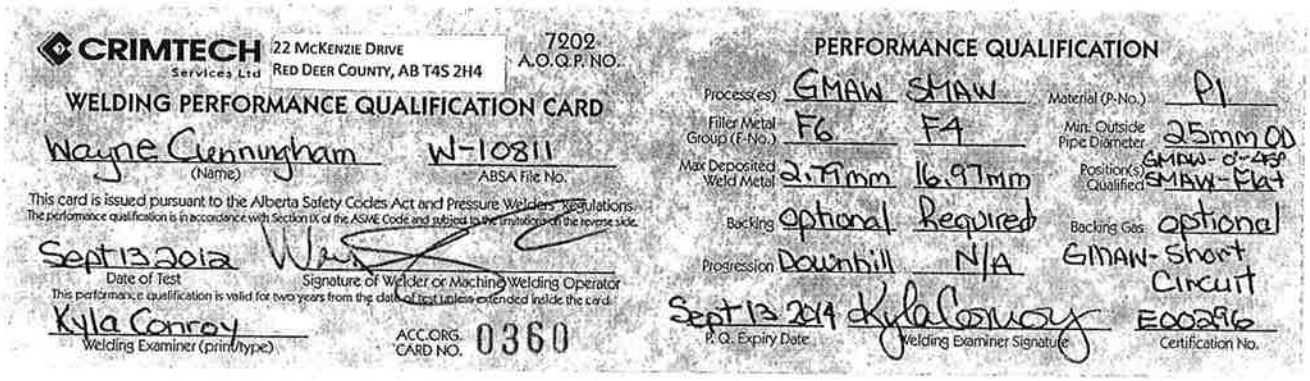
ACC.ORG. CARD NO. 0362

PERFORMANCE QUALIFICATION

Process(es)	SMAW	SMAW	Material (P-No.)	P1	
Filler Metal Group (F-No.)	F3	F4	Min. Outside Pipe Diameter	25mm OD	
Max Deposited Weld Metal	6.35mm	MTBW	Position(s) Qualified	All	
Backing	Optional	Required	Backing Gas	N/A	
Progression	Uphill	Uphill			

Sept 13 2014 — Kyla Conway — E00296
P. Q. Expiry Date — Welding Examiner Signature — Certification No.

WELDER ID: K



CRIMTECH Services Ltd
22 McKenzie Drive
Red Deer County, AB T4S 2H4
7202 A.O.Q.P. NO.

WELDING PERFORMANCE QUALIFICATION CARD

Wayne Cunningham (Name)
W-10811 ABSA File No.

This card is issued pursuant to the Alberta Safety Codes Act and Pressure Welders' Regulations.
The performance qualification is in accordance with Section IX of the ASME Code and subject to the limitations on the reverse side.

Sept 13 2012 Date of Test
Signature of Welder or Machine Welding Operator

This performance qualification is valid for two years from the date of test unless extended inside the card.

Kyla Conroy Welding Examiner (print/type)
ACC.ORG. CARD NO. 0360

PERFORMANCE QUALIFICATION

Process(es)	GMAW	SMAW	Material (P-No.)	P1
Filler Metal Group (F-No.)	F6	F4	Min. Outside Pipe Diameter	25mm OD
Max Deposited Weld Metal	2.77mm	16.97mm	Position(s) Qualified	GMAW - 0°-45° SMAW - Flat
Backing	optional	Required	Backing Gas	optional
Progression	Downhill	N/A		GMAW - Short Circuit

Sept 13 2014 P.Q. Expiry Date
Kyla Conroy Welding Examiner Signature
E002916 Certification No.

WELDER ID: K

RED DEER COLLEGE
Box 5005, Red Deer, Alberta
T4N 5H5

7114C
A.O.Q.P. No.

WELDER PERFORMANCE QUALIFICATION CARD

WAYNE CUNNIGHAM — W-10811
(Name) (ABSA File No.)

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

APRIL 30, 2011 — Signature of Welder
Date of Test

TIM WAINES — CARD Nº 6623
Examiner (Print/Type)

PERFORMANCE QUALIFICATION — CARD NO. 6623

Process(es) SAW — Materials (P. No.) P1 TO P1
Filler Metal
Group (F. No.) F6 — Min. Outside Pipe Diameter 73mm
Max Deposited Weld Metal MTBW — Position(s) Qualified FLAT
Backing REQUIRED
Progression N/A — Backing Gas N/A

APRIL 30, 2013 — Weld Examiner Signature — E-00291
P.Q. Expiry Date — Certification No.

WELDER ID: K

RED DEER COLLEGE
Box 5005, Red Deer, Alberta
T4N 5H5

7.1.14C.
A.O.Q.P. No.

WELDER PERFORMANCE QUALIFICATION CARD

WAYNE CUNNINGHAM (Name) W-10811 (ABSA File No.)

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

NOV 15, 2010 (Date of Test) (Signature of Welder)

TIM WAINES (Examiner (Print/Type)) CARD No. 6671

PERFORMANCE QUALIFICATION CARD NO. 6671

Process(es) GMAW SMAW
Filler Metal Group (F. No.) F6 F4
Max Deposited Weld Metal 3.07mm MTBW
Backing OPTIONAL REQUIRED
Progression N/A N/A
Materials (P. No.) P1 TO P1
Min. Outside Pipe Diameter 73mm
Position(s) HORIZONTAL
Qualified FLAT
Backing Gas OPTIONAL

NOV 15, 2012 (P.Q. Expiry Date) (Weld Examiner Signature) E-00291 (Certification No.)

WELDER ID: M

Alberta

ABSA
the pressure equipment safety authority

23692

Grade "B" Pressure Welder's
Certificate of Competency

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

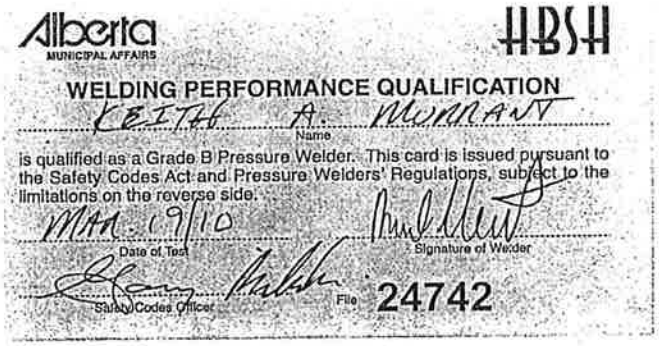
Dated at Edmonton
March 19, 2010

Government of Alberta

W-24742
File no.

Chief Inspector and Administrator

WELDER ID: M



Alberta
MUNICIPAL AFFAIRS

HBSH

WELDING PERFORMANCE QUALIFICATION

KEITH A. MURRANT
Name

is qualified as a Grade B Pressure Welder. This card is issued pursuant to the Safety Codes Act and Pressure Welders' Regulations, subject to the limitations on the reverse side.

MAR. 19/10
Date of Test

Signature of Welder

Safety Codes Officer

File 24742

WELDER ID: M

RDC

Red Deer College
Box 5005, Red Deer, Alberta
T4N 5H5

7114C
A.Q.Q.P. No.

WELDER PERFORMANCE QUALIFICATION CARD

KEITH MURRAY — W-24742
(Name) — (ABS-AB No.)

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

MARCH 19, 2012 — Keith Murray
Date of Test — Signature of Welder

TIM WALKER — CARD 2335
Examiner (Print/Type) — CARD

PERFORMANCE QUALIFICATION — CARD NO. 2335

Process(es): GMAW SMAW — Material (P. No.): P1 To P1
Filler Metal Group (F. No.): F6 F4 — Min. Outside Pipe Diameter: 25mm
Max. Deposited Weld Metal: 3.07mm 11.45mm — Position(s) Qualified: 5F, 0-45° FLAT
Backing: OPTIONAL REQUIRED — Backing Gas: OPTIONAL
Progression: DOWNHILL N/A

MARCH 19, 2012 — E-00291
P.Q. Exam. Date — Weld Examiner Signature — Certificate No.

WELDER ID: M

RDC

Red Deer College
Box 5005, Red Deer, Alberta
T4N 5H5

7114C
A.O.Q.P. No.

WELDER PERFORMANCE QUALIFICATION CARD

KEITH MURRAY — W-2474

[Name (s)] — [ABSA File No.]

This card is issued pursuant to the Safety Codes Act and Pressure Welders Regulations. The performance qualification is in accordance with Section IX A.S.M.E. Code and Subject to the limitations of the variables specified.

MARCH 19, 2014 — [Signature of Welder]

[Date of Test]

TIM WAINES — CARD: 0882

[Examiner (Print/Type)]

PERFORMANCE QUALIFICATION — CARD NO. 0882

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

MARCH 19 2014 — E-0029

[P.Q. Expiry Date] — [Weld Examiner Signature] — [Certification No.]

WELDER ID: A


Alberta
LABOUR
ABSA
Grade "B" Pressure Welder's
Certificate of Competency
This is to certify that Keith Watchel
W- 15834
October 31, 1997

WELDER ID: A

CRIMTECH Services Ltd
22 McKenzie Drive
Red Deer County, AB T4S 2H4

7202
A.O.Q.P. NO.

WELDING PERFORMANCE QUALIFICATION CARD

Keith Natchel
(Name)

W-15834
ABSA File No.

This card is issued pursuant to the Alberta Safety Codes Act and Pressure Welders' Regulations.
The performance qualification is in accordance with Section IX of the ASME Code and subject to the limitations contained overleaf.

Sept 13 2012
Date of Test

Signature of Welder or Machine Welding Operator

This performance qualification is valid for two years from the date of test unless extended inside the card.

Kyla Conroy
Welding Examiner (print/type)

ACC.ORG. CARD NO. 0363

PERFORMANCE QUALIFICATION

Process(es)	SMAW	SMAW	Material (P-No.)	P1
Filler Metal Group (F-No.)	F3	F4	Min. Outside Pipe Diameter	25mm OD
Max. Deposited Weld Metal	6.35mm	MTBW	Position(s) Qualified	All
Backing	optional	Required	Backing Gas	optional
Progression	uphill	uphill		

Sept 13 2014
P. Q. Expiry Date

Kyla Conroy
Welding Examiner Signature

E00296
Certification No.

WELDER ID: A

CRIMTECH Services Ltd
22 McKenzie Drive
Red Deer County, AB T4S 2H4
7202
A.O.Q.P. NO.

WELDING PERFORMANCE QUALIFICATION CARD

Keith Watchel (Name)
W-15834 ABSA File No.

This card is issued pursuant to the Alberta Safety Codes Act and Pressure Welders' Regulations.
The performance qualification is in accordance with Section IX of the ASME Code and subject to the limitations on the reverse side.

Sept 13 2012 Date of Test
Signature of Welder or Machine Welding Operator

This performance qualification is valid for two years from the date of test unless extended inside the card.

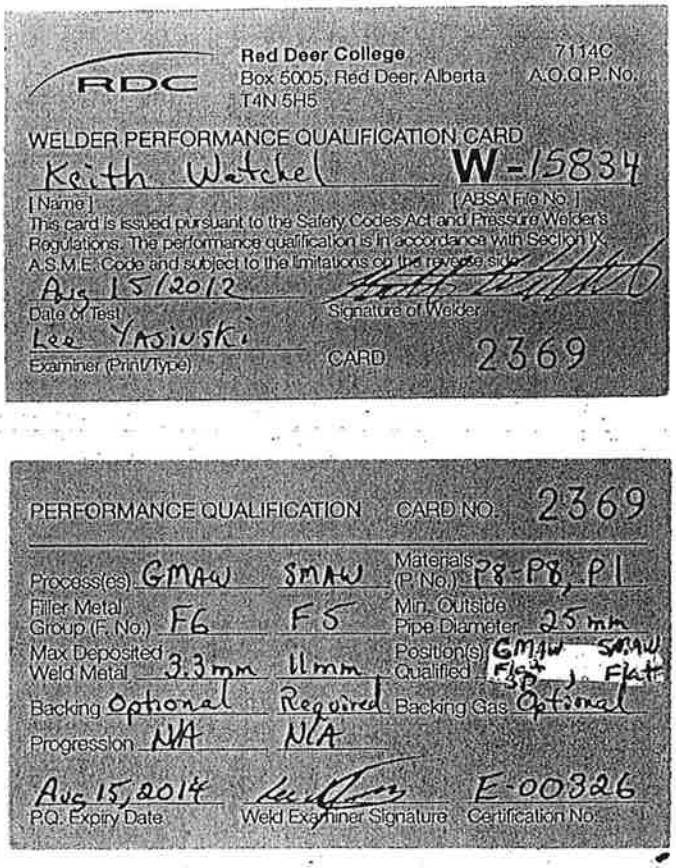
Kyla Conroy Welding Examiner (print/type)
ACC.ORG. CARD NO. 0361

PERFORMANCE QUALIFICATION

Process(es)	GMAW	SMAW	Material (P-No.) P1
Filler Metal Group (F-No.)	F6	F4	Min. Outside Pipe Diameter 25mm OD
Max Deposited Weld Metal	2.79mm	16.97mm	Position(s) Qualified SMAW 0-45° SMAW Flat
Backing	optional	Required	Backing Gas optional
Progression	Downhill	N/A	GMAW - Short Circuit.

Sept 13 2014 P. Q. Expiry Date
Kyla Conroy Welding Examiner Signature
E002296 Certification No.

WELDER ID: A



RDC

Red Deer College
Box 5005, Red Deer, Alberta
T4N 5H5

7114C
A.O.Q.P. No.

WELDER PERFORMANCE QUALIFICATION CARD

Keith Watchel — W-15834
[Name] — [ABSA File No.]

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

Aug 15/2012
Date of Test

Signature of Welder

Lee Yasinski
Examiner (Print/Type)

CARD 2369

PERFORMANCE QUALIFICATION — CARD NO. 2369

Process(es)	GMAW	SMAW	Materials (P. No.) P8-P8, P1
Filler Metal Group (F. No.)	F6	F5	Min. Outside Pipe Diameter 25 mm
Max Deposited Weld Metal	3.3 mm	11 mm	Position(s) Qualified GMAW SMAW Flat 3P, Flat
Backing	Optional	Required	Backing Gas Optional
Progression	N/A	N/A	

Aug 15, 2014
P.Q. Expiry Date

Weld Examiner Signature

E-00326
Certification No.

Welder "C"

Alberta
MUNICIPAL AFFAIRS

ABSA

Grade "B" Pressure Welder's Certificate of Competency

This is to Certify that: Brian Church
having complied with provisions of the Safety Codes Act, is authorized to engage in pressure welding in accordance with the prescribed Regulations.

Dated at Edmonton, this
June 28, 2001

W- 19473
File No.

Chief Inspector and Administrator

RED DEER COLLEGE
Box 5005, Red Deer, Alberta
T4N 5H5

7114C
A.C.S.P. No.

WELDER PERFORMANCE QUALIFICATION CARD

BRIAN CHURCH (Name)
W-19473 (ABSA File No.)

This card is issued pursuant to the Safety Codes Act and the pressure welding Regulations. The performance qualification is in accordance with Section X, A.S.M.E. Code and subject to the limitations and variables listed.

NOV 15, 2010
Date of Test

Signature of Welder

TIM WAWES
Examiner (Print/Type)

CARD No 6672

PERFORMANCE QUALIFICATION CARD NO. 6672

Process(es) GMAW SMAW
Materials (P No.) P1 To P1
Filler Metal Group (F No.) F6 F4
Min. Outside Pipe Diameter 73mm
Max Deposited Weld Metal 3.07mm MTBW
Position(s) HORIZONTAL
Backing OPTIONAL REQUIRED
Qualified FLAT
Progression N/A N/A
Backing Gas OPTIONAL

NOV 15 2012
PQ, Expiry Date

Weld Examiner Signature

E-00291
Certification No.

Welder “C”

RED DEER COLLEGE
Box 5005, Red Deer, Alberta
T4N 5H5

7114C
A.Q.C.P. No.

WELDER PERFORMANCE QUALIFICATION CARD

BRIAN CHURCH (Name)

W-19493 (ABSA File No.)

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

MARCH 14, 2011 (Date of Test)

[illegible] (Signature of Welder)

TIM WAINES (Examiner (Print/Type))

CARD No 6588

PERFORMANCE QUALIFICATION — CARD NO. 6588

Process(es)	GMAW SMAW	Materials (P No.)	P1 TO P1
Filler Metal Group (F No.)	F6 F4	Min. Outside Pipe Diameter	25mm
Max. Deposited Weld Metal	3.27mm 11.41mm	Position(s) Qualified	S.P. 0-45° FLAT
Backing	OPTIONAL REQUIRED		
Progression	DOWNHILL N/A	Backing Gas	OPTIONAL

MARCH 14, 2013 (P.Q. Expiry Date)

[illegible] (Weld Examiner Signature)

E-00291 (Certification No.)

RED DEER COLLEGE
Box 5005, Red Deer, Alberta
T4N 5H5

7114C
A.Q.C.P. No.

WELDER PERFORMANCE QUALIFICATION CARD

BRIAN CHURCH (Name)

W-19493 (ABSA File No.)

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

MARCH 14, 2011 (Date of Test)

[illegible] (Signature of Welder)

TIM WAINES (Examiner (Print/Type))

CARD No 6590

PERFORMANCE QUALIFICATION — CARD NO. 6590

Process(es)	SMAW SMAW	Materials (P No.)	P1 TO P1
Filler Metal Group (F No.)	F3 F4	Min. Outside Pipe Diameter	25mm
Max. Deposited Weld Metal	5.75mm UNTRIM	Position(s) Qualified	ALL
Backing	OPTIONAL REQUIRED		
Progression	UPHILL UPHILL	Backing Gas	N/A

MARCH 14, 2013 (P.Q. Expiry Date)

[illegible] (Weld Examiner Signature)

E-00291 (Certification No.)

PRODUCTS DIVISION
Quality Control Department
MTR Log

CRIMTECH Services Ltd

Client: **Husky Oil Operations Ltd.**		Project Title: **Large Water Transfer Skids**	
Project Control Numbers:	**8400432736** (Client PO No.:) (Client AFE No.:)	**CSN 11437- 11441** (Crimtech CSN No.)	**P1378 - 4** (Crimtech Project No.:)

MTR Log Number	Heat Number	NPS Inches	Item Description
1	1026364V	3”	Pipe, Sch 40, SA-106B
2	1746/11	3”	Flange, 150 ANSI RFWN, Sch 40, SA-105N
3	ME503	3”	Elbow, LR 90 Deg, Sch 40, SA-234-WPB
4	1D3416	3”	Elbow, LR 90 Deg, Sch 40, SA-234-WPB
5	1023682V	3”	Pipe, Sch 40, SA-106B
6	MB 604C	6” x 3”	Concentric Reducer, Sch 40, SA-234-WPB
7	LJ 720C	6” x 3”	Concentric Reducer, Sch 40, SA-234-WPB
8	48099	2”	Pipe, Sch 40, SA-106B
9	1I4221	2”	Tee, BW, Sch 40, SA-234-WPB
10	10/72708	2”	Flange, 600 ANSI RFWN, Sch 40, SA-105N
11	1126288V	2”	Pipe, Sch 40, SA-106B
12	11C10312	2”	Tee, BW, Sch 40, SA-234-WPB
13	54G10088	2”	Tee, BW, Sch 40, SA-234-WPB
14	1446/11	2”	Flange, 300 ANSI RFWN, Sch 40, SA-105N
15	970159	2”	Pipe, Sch 40, SA-106B
16	1C6100	2”	Elbow, LR 90 Deg, Sch 40, SA-234-WPB

MTR Log Number	Heat Number	NPS Inches	Item Description
17	168720	2”	Pipe, Sch 40, SA-106B
18	443T1	6”	Flange, 150 ANSI RFWN, Sch 40, SA-105N
19	JC1	2”	Elbow, LR 90 Deg, Sch 40, SA-234-WPB
20	HJ17	2”	Elbow, LR 90 Deg, Sch 40, SA-234-WPB
21	AC954	2”	Elbow, LR 90 Deg, Sch 40, SA-234-WPB
22	L803	2”	Elbow, LR 90 Deg, Sch 40, SA-234-WPB
23	1E6881	4” x 2”	Concentric Reducer, Sch 40, SA-234-WPB
24	4390809	4”	Flange, 300 ANSI RFWN, Sch 40, SA-105N
25	53H00114-1	2”	Elbow, LR 90 Deg, Sch 40, SA-234-WPB
26	1126074V	3”	Pipe, Sch 40, SA-106B
27	10/30951	6”	Flange, 150 ANSI RFWN, Sch 40, SA-105N
28	11/36127	6”	Flange, 150 ANSI RFWN, Sch 40, SA-105N
29	1126289V	2”	Pipe, Sch 40, SA-106B
30	54G00102	2”	Elbow, LR 90 Deg, Sch 40, SA-234-WPB
31	1126280V	3”	Pipe, Sch 40, SA-106B
32	54D00142	3”	Elbow, LR 90 Deg, Sch 40, SA-234-WPB
33	3124	6” x 3”	Concentric Reducer, Sch 40, SA-234-WPB
34	11C20026	6” x 3”	Concentric Reducer, Sch 40, SA-234-WPB
35	11F20015	4” x 2”	Concentric Reducer, Sch 40, SA-234-WPB
36	10/33382	2”	Flange, 300 ANSI RFWN, Sch 40, SA-105N
37	10/30230	4”	Flange, 300 ANSI RFWN, Sch 40, SA-105N

MTR Log Number	Heat Number	NPS Inches	Item Description
38	0K6388	2”	Tee, BW, Sch 40, SA-234-WPB
39	0A5108	2”	Tee, BW, Sch 40, SA-234-WPB
40	931272	2”	Flange, 300 ANSI RFWN, Sch 40, SA-105N
41	10/31377	2”	Flange, 300 ANSI RFWN, Sch 40, SA-105N
42	59A1	2”	Flange, 600 ANSI RFWN, Sch 40, SA-105N
43	931276	2”	Flange, 600 ANSI RFWN, Sch 40, SA-105N
44	08593	2”	Tee, BW, Sch 40, SA-234-WPB
45	11M00005	3”	Elbow, LR 90 Deg, Sch 40, SA-234-WPB
46	1C2785	6” x 3”	Concentric Reducer, Sch 40, SA-234-WPB
47	13145	2”	Flange, 300 ANSI RFWN, Sch 40, SA-105N
48	11M20008	4” x 2”	Concentric Reducer, Sch 40, SA-234-WPB
49	10/72782	2”	Flange, 300 ANSI RFWN, Sch 40, SA-105N
50	10/33382	2”	Flange, 600 ANSI RFWN, Sch 40, SA-105N
51	4443569	3”	Flange, 150 ANSI RFWN, Sch 40, SA-105N
52	1127158V	3”	Pipe, Sch 40, SA-106B
53	0A2951	3”	Flange, 150 ANSI RFWN, STD, SA-105N
54	83608	4”	Flange, 300 ANSI RFWN, STD, SA-105N
55	11B20006	4” x 2”	Concentric Reducer, Sch 40, SA-234-WPB
56	11B10803	2”	Tee, BW, Sch 40, SA-234-WPB
57	11N00006	3”	Elbow, LR 90 Deg, Sch 40, SA-234-WPB
58	6G7212	6” x 3”	Concentric Reducer, STD, SA-234-WPB

MTR Log Number	Heat Number	NPS Inches	Item Description
59	615T1	6”	Flange, 150 ANSI RFWN, Sch 40, SA-105N
60	9359	2”	Flange, 300 ANSI RFWN, Sch 40, SA-105N
61	I06	2”	Flange, 600 ANSI RFWN, STD, SA-105N
62	10A20003	4” x 2”	Concentric Reducer, Sch 40, SA-234-WPB
63	AL890	2”	Flange, 600 ANSI RFWN, STD, SA-350-LF2
64	10/33382	2	Flange, 600 ANSI RFWN, STD, SA-105N

Only highlighted information is applicable to Batch and corresponding CSN numbers.

P1378

METALFAR
PRODOTTI INDUSTRIALI S.P.A.

STAMPAGGIO A CALDO DI ACCIAI COMUNI - LEGATI E INOSSIDABILI

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

SALA PROVE E ANALISI MATERIALI / MATERIAL TEST DEPARTMENT

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

CERTIFICATO DI COLLAUDO SECONDO EN 10204 - 3.1 INSPECTION CERTIFICATE

FORGED FLANGES & FITTINGS LTD
CASTLE HOUSE - STATION ROAD
EN5 1PE NEW BARNET/HERTFORD... GB

Certif. N. 5291 Del/Dated 02.11.2011
Fattura / Invoice N. 3554 Del/Dated 28.10.2011
DDT / Del Note N. 4030 Del/Dated 28.10.2011
Ns.Ord. / Our ref. N. Del/Dated

COD. COL. COLATA / HEAT CODE HEAT	POS. ITEM	VS.ORDINE YOUR REFERENCE	Q.TA' Q.TY	DESCRIZIONE DESCRIPTION
1746/11	025	3798H/FR	147,00	W/N 150 RF 3" STD A105

DIM.IN ACC. A / DIM. ACCORDANCE TO: ASME/ANSI B16.5 -2009

VISIVO E DIMENS. / VIS. & DIMENS.: SATISFACTORY

MATERIALE / MATERIAL: ASTM A105

C%	Si%	Mn%	S%	P%	Cr%	Ni%	Mo%	Ti%	Cu%	V%	Nb%	N%	Al%	C.E.%	B %
0,184	0,220	1,090	0,003	0,005	0,090	0,140	0,049	0,010	0,170	0,003	0,003	0,000	0,025	0,415	0,000

PROVETTA / TEST SPECIMEN SEZ. mm2 SECT. mm2	LUNG. mm LENGHT mm	FORMA SHAPE 1= O 2=□	SNERVAMENTO YIELD POINT N/mm2 >=0,2%	ROTTURA TENSILE STRENGHT N/mm2 >=	ALLUNGAMENTO ELONGATION %>=	CONTRAZIONE REDUCTION OF AREA %>=	DUREZZA HARDNESS HBW	RESILIENZA / IMPACT TEST - JOULE/cm2 TIPO / TYPE 10x10mm	°C	1	2	3	SNERVAMENTO YIELD POINT N/mm2 >=1,0%	Ns.Rif. OUR REF.
126,60	50,80	1	345,0	569,0	30,0	57,0	170,0 - 174,0	KV	20	86	89	85	0,0	

MATERIALE IN ACCORDO A / MATERIAL IN ACC. TO: ASTM/ASME A 105/SA 105 M - 10 ASME CODE SECT. II, PART A, ED. 2010
CSA CAN3 Z-245.12-09 GRADE 248 CAT.I SOUR SERVICE

TRATTAMENTO TERMICO / HEAT TREATMENT: NORMALIZED AT 920 C - COOLED IN STILL AIR

FORNO / FURNACE: ELECTRIC FURNACE

ORIGINE / ORIGIN: EUROPE

CRIMTECH SERVICES LTD.
MATERIAL CONFORMS TO: ASME
SEC. II, 20 10 EDITION, 20__ ADDENDA
MAR 13 2012
By:
P.O. No.

NOTE / NOTES	UFFICIO CONTROLLO QUALITA' / QUALITY CONTROL DEPARTEMENT	ENTE UFFICIALE DI COLLAUDO / INSPECTION AUTHORITY	MARCHIO PRODUZIONE / MANUFACTURER'S SYMBOL
MANUFACTURING IN ACCORDANCE WITH ORDER AND SPECIFICATION MATERIAL IN ACCORDANCE WITH NACE MR-0175/2003 ISO 15156-2009 - SOUR SERVICE MATERIAL IN ACCORDANCE WITH NACE MR-0103/2010 - SOUR SERVICE	S. Corti		MFF

INSPECTION CERTIFICATE

RIGID INDUSTRIES CO., LTD.

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

PURCHASER : SEYBOLD

STANDARD : ASTM A234 WPB-07
ASME SA234 WPB-04
CSA Z245.11-05 Gr.241 Cat I Sour Service

MATERIALS : ASTM A106 Gr.B (SEAMLESS PIPE)

INSP. SPEC. : ASME B16.9 - 03

DATE: 2011 - 10 - 18

ORDER NO: 7004214/2769615OR210

P.I. NO: 1D06-5

CERTIFI. NO: 508

ACCORDING TO EN10204/DIN50049/3.1

ITEM NO.	PRODUCT & SIZE		QUANTITY PCS	MFG NO.	VISUAL & DIMENTIONAL INSPECTION	HARDNESS MAX. 197 HB	HEAT TREATMENT (NOTE)	MAGNETIC PARTICLE EXAMINATION	IMPACT TEST (J)
1	ELL 45 LR 2"	STD	80	1C6000	GOOD	135 - 140	A		
2	ELL 45 LR 3"	STD	27	0H25125	GOOD	142 - 146	A		
3	ELL 45 LR 3"	STD	373	1E2737	GOOD	135 - 143	A		
4	ELL 45 LR 3"	XH	75	1F4098	GOOD	134 - 134	A		
5	ELL 90 LR 1.1/2"	STD	350	1C7676 (1C)	GOOD	130 - 132	A		
6	ELL 90 LR 2"	160	140	1D4280	GOOD	142 - 169	A		
7	ELL 90 LR 3"	160	125	1E6575	GOOD	134 - 150	A		
8	ELL 90 LR 10"	STD	8	1D4079	GOOD	142 - 145	A		
9	CON-RED 8X6"	STD	51	1E7636	GOOD	131 - 155	N		
10	TEE 2"	STD	200	114221	GOOD	122 - 139 ✓	N	GOOD	

CRM TECH SERVICES LTD.
MATERIAL CONFORMS TO: ASME
SEC. II, 2010 EDITION , 20__ ADDENDA
MAR 12 2012
By:
P.O. No.

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 %	C.E. X100
	STANDARD	MIN.		10	29									35.0	60.0		
		MAX.	30		135	50	58	40	40	40	15	8	20		95.0		50
1	908300		19	26	47	20	9	2	1	2	1	1	<1	66.2	77.0	36.2	27
2	308825		19	27	59	8	2	5	3	3	1	<1	<1	42.5	61.3	35.7	30
3	314837		17	27	56	7	2	5	4	4	1	<1	<1	43.5	65.2	29.8	27
4	314598		19	25	54	7	3	6	4	4	2	<1	<1	43.5	61.9	31.9	29
5	008076		21	26	49	8	7	9	3	3	1	1	<1	44.5	70.4	30.2	30
6	306380		12	17	74	9	7	5	3	3	1	<1	<1	48.8	65.2	30.2	25
7	310275		20	22	55	7	1	6	3	3	1	<1	<1	44.0	68.7	32.5	30
8	203379		15	25	69	10	6	9	2	3	1	1	2	41.4	62.7	35.2	28
9	204236		18	22	96	14	7	8	2	5	1	<1	<1	43.0	65.9	35.2	35
10	327921		13 ✓	13 ✓	83 ✓	10 ✓	3 ✓	5 ✓	3 ✓	4 ✓	1 ✓	<1 ✓	1	41.6 ✓	66.5 ✓	36.5 ✓	28

(NOTE): A: HOT FORMED WITH FINAL TEMPERATURE BETWEEN 620℃-980℃,AIR COOLING.
N: NORMALIZING AT TEMPERATURE 880℃X0.5HR,AIR COOLING.
NACE MR-01-75-03/ISO15156.2 & NACE MR 0103-03 : SATISFACTORY

WE HEREBY CERTIFY THAT THE PRODUCT DESCRIBED HEREIN HAS BEEN MANUFACTURED IN ACCORDANCE WITH THE SPECIFICATIONS CONCERNED AND ALSO WITH THE PURCHASER'S REQUIREMENTS AND THAT THE TEST RESULTS SHOWN HEREIN ARE CORRECT.

Ou L Lan

MANAGER OF Q.A. DEPT.

P1378
ERP 1006456

METALFAR
PRODOTTI INDUSTRIALI S.P.A.
STAMPAGGIO A CALDO DI ACCIAI COMUNI - LEGATI E INOSSIDABILI
SALA PROVE E ANALISI MATERIALI / MATERIAL TEST DEPARTMENT

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

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

CERTIFICATO DI COLLAUDO SECONDO EN 10204 - 3.1 INSPECTION CERTIFICATE

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

Certif. N. 4640 Del/Dated 16.11.2010
Fattura / Invoice N. 3248 Del/Dated 15.11.2010
DDT / Del Note N. 6100 Del/Dated 15.11.2010
Ns.Ord. / Our ref. N. Del/Dated

COD. COL. HEAT CODE	COLATA HEAT	POS. ITEM	VS.ORDINE YOUR REFERENCE	Q.TA' Q.TY	DESCRIZIONE DESCRIPTION	DIM.IN ACC. A DIM. ACCORDANCE TO	VISIVO E DIMENS. VIS. & DIMENS.
	10/30203	032	654/FR	150,00	W/N 300 RF 4" STD A105	ASME/ANSI B16.5	SATISFACTORY

MATERIALE / MATERIAL	C%	Si%	Mn%	S%	P%	Cr%	Ni%	Mo%	Ti%	Cu%	V%	Nb%	N%	Al%	C.E.%
ASTM A105	0,190	0,240	1,100	0,009	0,009	0,070	0,040	0,010	0,018	0,140	0,002	0,002	0,000	0,025	0,402

PROVETTA / TEST SPECIMEN SEZ. mm2 SECT. mm2	LUNG. mm LENGHT mm	FORMA SHAPE 1=○ 2=□	SNERVAMENTO YIELD POINT N/mm2 >=0,2%	ROTTURA TENSILE STRENGHT N/mm2 >=	ALLUNGAMENTO ELONGATION %>=	CONTRAZIONE REDUCTION OF AREA %>=	DUREZZA HARDNESS HB	RESILIENZA / IMPACT TEST - JOULE/cm2 TIPO / TYPE 10x10mm	°C	1	2	3	SNERVAMENTO YIELD POINT N/mm2 >=1,0%	Ns.Rif. OUR REF.
126,60	50,80	1	348,0	532,0	32,0	60,0	163,0 - 165,0	KV	20	86	88	89	0,0	

MATERIALE IN ACCORDO A / MATERIAL IN ACC. TO: ASTM/ASME A 105/SA 105 M - 09 CSA CAN3 Z-245.12-05 GRADE 248 CAT.I
TRATTAMENTO TERMICO / HEAT TREATMENT: NORMALIZED AT 920 C - COOLED IN STILL AIR
FORNO / FURNACE: ELECTRIC FURNACE
ORIGINE / ORIGIN: EUROPE

COD. COL. HEAT CODE	COLATA HEAT	POS. ITEM	VS.ORDINE YOUR REFERENCE	Q.TA' Q.TY	DESCRIZIONE DESCRIPTION	DIM.IN ACC. A DIM. ACCORDANCE TO	VISIVO E DIMENS. VIS. & DIMENS.
	10/30938	034	654/FR	125,00	W/N 300 RF 4" XS A105	ASME/ANSI B16.5	SATISFACTORY

MATERIALE / MATERIAL	C%	Si%	Mn%	S%	P%	Cr%	Ni%	Mo%	Ti%	Cu%	V%	Nb%	N%	Al%	C.E.%
ASTM A105	0,190	0,210	1,150	0,010	0,015	0,110	0,040	0,010	0,018	0,110	0,000	0,000	0,000	0,025	0,416

PROVETTA / TEST SPECIMEN SEZ. mm2 SECT. mm2	LUNG. mm LENGHT mm	FORMA SHAPE 1=○ 2=□	SNERVAMENTO YIELD POINT N/mm2 >=0,2%	ROTTURA TENSILE STRENGHT N/mm2 >=	ALLUNGAMENTO ELONGATION %>=	CONTRAZIONE REDUCTION OF AREA %>=	DUREZZA HARDNESS HB	RESILIENZA / IMPACT TEST - JOULE/cm2 TIPO / TYPE 10x10mm	°C	1	2	3	SNERVAMENTO YIELD POINT N/mm2 >=1,0%	Ns.Rif. OUR REF.
126,60	50,80	1	339,0	537,0	30,0	60,0	163,0 - 165,0	KV	20	89	90	90	0,0	

MATERIALE IN ACCORDO A / MATERIAL IN ACC. TO: ASTM/ASME A 105/SA 105 M - 09 CSA CAN3 Z-245.12-05 GRADE 248 CAT.I
TRATTAMENTO TERMICO / HEAT TREATMENT: NORMALIZED AT 920 C - COOLED IN STILL AIR
FORNO / FURNACE: ELECTRIC FURNACE
ORIGINE / ORIGIN: EUROPE

COD. COL. HEAT CODE	COLATA HEAT	POS. ITEM	VS.ORDINE YOUR REFERENCE	Q.TA' Q.TY	DESCRIZIONE DESCRIPTION	DIM.IN ACC. A DIM. ACCORDANCE TO	VISIVO E DIMENS. VIS. & DIMENS
	10/72708	035	654/FR	150,00	W/N 600 RF 2" STD A105	ASME/ANSI B16.5	SATISFACTORY

MATERIALE / MATERIAL	C%	Si%	Mn%	S%	P%	Cr%	Ni%	Mo%	Ti%	Cu%	V%	Nb%	N%	Al%	C.E.%
ASTM A105	0,195	0,200	1,080	0,009	0,013	0,090	0,040	0,010	0,023	0,180	0,003	0,001	0,000	0,025	0,410

PROVETTA / TEST SPECIMEN SEZ. mm2 SECT. mm2	LUNG. mm LENGHT mm	FORMA SHAPE 1=○ 2=□	SNERVAMENTO YIELD POINT N/mm2 >=0,2%	ROTTURA TENSILE STRENGHT N/mm2 >=	ALLUNGAMENTO ELONGATION %>=	CONTRAZIONE REDUCTION OF AREA %>=	DUREZZA HARDNESS HB	RESILIENZA / IMPACT TEST - JOULE/cm2 TIPO / TYPE 10x10mm	°C	1	2	3	SNERVAMENTO YIELD POINT N/mm2 >=1,0%	Ns.Rif. OUR REF.
126,60	50,80	1	341,0	552,0	32,0	57,0	166,0 - 170,0	KV	20	90	83	90	0,0	

MATERIALE IN ACCORDO A / MATERIAL IN ACC. TO: ASTM/ASME A 105/SA 105 M - 09 CSA CAN3 Z-245.12-05 GRADE 248 CAT.I
TRATTAMENTO TERMICO / HEAT TREATMENT: NORMALIZED AT 920 C - COOLED IN STILL AIR
FORNO / FURNACE: ELECTRIC FURNACE
ORIGINE / ORIGIN: EUROPE

NOTE MANUFACTURING IN ACCORDANCE WITH ORDER AND SPECIFICATION
NOTES MATERIAL IN ACCORDANCE WITH NACE MR-0175/2003 ISO 15156 - SOUR SERVICE
MATERIAL IN ACCORDANCE WITH NACE MR-0103/2007 - SOUR SERVICE

CRIMTECH SERVICES LTD.
MATERIAL CONFORMS TO: ASME
EDITION , 20 ADDENDA
FEB 29 2012
By:
P.O. No.

UFFICIO CONTROLLO QUALITA' / QUALITY CONTROL DEPARTEMENT: S. Corti Sergio
ENTE UFFICIALE DI COLLAUDO / INSPECTION AUTHORITY:
MARCHIO PRODUZIONE / MANUFACTURER'S SYMBOL: MFF

P13, ERP 1004136

Purchaser : CCTF CORPORATION

INSPECTION CERTIFICATE

TO EN10204 3.1

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

E-No. MC-266 | Purchase Order No. 4000060 | Job No.

D M Y Certificate No.
06/04/2011 T- 2011200266

No.		MFG. No. (Heat Identification No.)	Specification for Material Made from Seamless Pipe: ASTM A234-10/ASME SA234-07 Gr.WPB CSA Z245.11-09 Gr.241 CAT1 NACE MR0175/ISO 15156-2 R3-03 &MR0103-07	Specification for Inspection: ASME B16.9-2007,B16.25-2007	Visual Examination: Good	Dimensional Inspection: Good
			Product & Size (T:*1)	Quantity	Heat Treatment (Note 1)	Hardness Actual Data	Item No.
1		11B10802	T WPB 8 S40	28/80	N	HB : 120 - 150	7511878
2		11B10869	T WPB 8 S40	52/80	N	HB : 120 - 150	7511876
3		11C10312	T WPB 2 S40	550	N	HB : 115 - 145 ✓	7511736
4		11B10867	T WPB 10 S40	8/80	N	HB : 120 - 150	7511882
5		11C10825	T WPB 10 S40	25/80	N	HB : 120 - 150	7511882

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.		%	HARDNESS MAX
Max.			10	29										240	415	30	197 HB : GOOD
Material Heat No.		30	50	106	50	58	40	40	25	15	80	20	50		585		
1	J0L4905	19	21	79	11	6	2	2	4	7	0	0	35	307	476	47	
2	J0L4905	19	21	79	11	6	2	2	4	7	0	0	35	307	476	47	
3	J0K8310	18 ✓	16 ✓	82 ✓	15 ✓	6 ✓	1 ✓	3 ✓	6 ✓	3 ✓	0	0	34	283 ✓	461 ✓	61 ✓	
4	J9LC039	19	28	89	12	9	1	2	4	8	0	0	36	346	509	44	
5	J9LC039	19	28	89	12	9	1	2	4	8	0	0	36	346	509	44	

CRIMTECH SERVICES LTD.
MATERIAL CONFORMS TO: ASME
SEC. II, 20 10 EDITION , 20 __ ADDENDA
MAR 1 2 2012
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° Cx0.5 HR. Air Cooling

The fittings was manufactured,sampled,tested,and inspected in accordance with the specification,and was found to meet the requirements

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

Quality Assurance Manager
Thai Benkan Co., Ltd.

12

R1 78 ERP 1004136

Purchaser : CE Franklin Ltd.

INSPECTION CERTIFICATE

TO EN10204 3.1

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

E-No.	Purchase Order No.	Job No.	D M Y	Certificate No.
MC-502	P/O 2025082-OR-2100		22-12-2011	T- 2011200914

No.		MFG. No.	Specification for Material Made from Seamless Pipe ASTM A234-11/ASME SA234-10 Gr.WPB CSA Z245-11-09 Gr.241 CAT1 SS NACE MR0175/ISO 15156-2 R3-09&MR0103-10	Specification for Inspection ASME B16.9-2007,B16.25-2007		Visual Examination	Dimensional Inspection
			Product & Size (T:*1)	Quantity	Heat Treatment (Note 1)	Good	Good
1		54G10094-1	T WPB 4 X 2 STD/XS	7/150	N	Boron(%) <0.0001	Item No. 7510419
2		54G10088	T WPB 2 STD	300	N	<0.0000	7511736
3		54G10089	T WPB 3 STD	110/200	N	<0.0000	7511778
4		54G10093	T WPB 3 X 2 STD/XS	125	N	0.0002	7510418
5		54G10094-2	T WPB 4 X 2 STD/XS	108/150	N	<0.0000	7510419

Specification / Material Heat No.		Chemical Composition %												Tension Test *2			
		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.		%	
Min.														240	415	30	HARDNESS MAX
Max.			10	29													197 HB : GOOD
		30		106	50	58	40	40	40	15	80	20			655		
1	1-81165	18	24	86	14	3	<1	1	5	1	<1	1	34	275	457	43	
2	985768	15	21	73	18	2	14	8	19	5	TR	TR	33	319	501	33	
3	770305	16	20	76	15	4	14	6	12	4	TR	TR	33	322	471	38	
4	45716	17	26	90	14	1	7	4	6	3	2	1	35	326	486	36	
5	769098	16	17	74	16	5	15	7	18	6	TR	TR	35	306	457	43	

CRIMTECH SERVICES LTD.
MATERIAL CONFORMS TO: ASME
SEC. II, 2010 EDITION, 20__ ADDENDA
MAR 12 2012
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° Cx0.5 HR. Air Cooling

The fittings was manufactured,sampled,tested,and inspected in accordance with the specification, and was found to meet the requirements.

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

Quality Assurance Manager
Thai Benkan Co., Ltd.

* 1 : "T" symbolized wall thickness in mm. * 2 : YS Yield strength TS = Tensile strength E = Elongation

Form TZ-6A/3

(3)

P1378 1004135

METALFAR
PRODOTTI INDUSTRIALI S.P.A.

STAMPAGGIO A CALDO DI ACCIAI COMUNI - LEGATI E INOSSIDABILI

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

SALA PROVE E ANALISI MATERIALI / MATERIAL TEST DEPARTMENT

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

CERTIFICATO DI COLLAUDO SECONDO EN 10204 - 3.1 INSPECTION CERTIFICATE

FORGED FLANGES & FITTINGS LTD
CASTLE HOUSE - STATION ROAD
EN5 1PE NEW BARNET/HERTFORD... GB

Certif. N. 4683 Del/Dated 29.09.2011
Fattura / Invoice N. 3175 Del/Dated 29.09.2011
DDT / Del Note N. 3598 Del/Dated 29.09.2011
Ns.Ord. / Our ref. N. Del/Dated

COD. COL. COLATA / HEAT CODE HEAT	POS. / ITEM	VS.ORDINE / YOUR REFERENCE	Q.TA' / Q.TY	DESCRIZIONE / DESCRIPTION
1446/11	033	3758	80,00	W/N 300 RF 2" STD A105

DIM.IN ACC. A / DIM. ACCORDANCE TO: ASME/ANSI B16.5 -2009

VISIVO E DIMENS. / VIS. & DIMENS.: SATISFACTORY

MATERIALE / MATERIAL: ASTM A105

C%	Si%	Mn%	S%	P%	Cr%	Ni%	Mo%	Ti%	Cu%	V%	Nb%	N%	Al%	C.E.%
0,182	0,200	1,070	0,006	0,005	0,080	0,100	0,026	0,018	0,120	0,003	0,002	0,000	0,025	0,397

PROVETTA / TEST SPECIMEN SEZ. mm2 SECT. mm2	LUNG. mm LENGHT mm	FORMA SHAPE 1=O 2=□	SNERVAMENTO YIELD POINT N/mm2 >=0,2%	ROTTURA TENSILE STRENGHT N/mm2 >=	ALLUNGAMENTO ELONGATION %>=	CONTRAZIONE REDUCTION OF AREA %>=	DUREZZA HARDNESS HBW
126,60	50,80	1	343,0	552,0	30,0	58,0	166,0 - 170,0

RESILIENZA / IMPACT TEST - JOULE/cm2

TIPO / TYPE 10x10mm	°C	1	2	3
KV	20	88	86	87

SNERVAMENTO YIELD POINT N/mm2 >=1,0% 0,0

Ns.Rif. OUR REF.

MATERIALE IN ACCORDO A / MATERIAL IN ACC. TO: ASTM/ASME A 105/SA 105 M - 10 ASME CODE SECT. II, PART A, ED. 2010

TRATTAMENTO TERMICO / HEAT TREATMENT: NORMALIZED AT 920 C - COOLED IN STILL AIR

FORNO / FURNACE: ELECTRIC FURNACE

ORIGINE / ORIGIN: EUROPE

CRIMTECH SERVICES LTD.
MATERIAL CONFORMS TO: ASME
SEC. II, 20 10 EDITION , 20__ ADDENDA
FEB 2 2 2012
By: dll
P.O. No.

VERIFIED TRUE COPY OF ORIGINAL FORGED FLANGES & FITTINGS LIMITED

NOTE / NOTES: MATERIAL IN ACCORDANCE WITH NACE MR-0175/2003 ISO 15156-2009
2011

UFFICIO CONTROLLO QUALITA' / QUALITY CONTROL DEPARTEMENT: S. Corti

ENTE UFFICIALE DI COLLAUDO / INSPECTION AUTHORITY

MARCHIO PRODUZIONE / MANUFACTURER'S SYMBOL: MFF

14

P 378 ERP 1003884

INSPECTION CERTIFICATE

RIGID INDUSTRIES CO., LTD.

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

PURCHASER : SEYBOLD

STANDARD : ASTM A234 WPB-07
ASME SA234 WPB-04
CSA Z245.11-05 Gr.241 Cat I Sour Service

MATERIALS : ASTM A106 Gr.B (SEAMLESS PIPE)

INSP. SPEC. : ASME B16.9 - 03

DATE: 2011 - 09 - 09

ORDER NO: 7004214/2769615OR210

P.I. NO: 1D06-4

CERTIFI. NO: 449

ACCORDING TO EN10204/DIN50049/3.1

ITEM NO.	PRODUCT & SIZE			QUANTITY PCS	MFG NO.	VISUAL & DIMENTIONAL INSPECTION	HARDNESS MAX. 197 HB	HEAT TREATMENT (NOTE)	MAGNETIC PARTICLE EXAMINATION	IMPACT TEST (J)
1	TEE	1"	XH	10	0K2306 (0K	GOOD	131 - 153	N	GOOD	
2	TEE	3" 1171063	XH	250	1F1375	GOOD	128 - 150	N	GOOD	
3	RED-TEE	8X6" 1175419	STD	20	1E5951	GOOD	134 - 145	N	GOOD	
4	ELL 90 LR	2" 1171231	STD	1000	1C6100	GOOD	139 - 144 ✓	A		
5	ELL 90 LR	3" 1171637	STD	850	1E2387	GOOD	143 - 146	A		
6	CON-RED	3X1.1/2" 1174340	XH	1	6K9381	GOOD	138 - 144	N		
7	CON-RED	3X1.1/2" 1174340	XH	3	1D6643	GOOD	135 - 151	N		

CRIMSON SERVICES LTD.
MATERIAL CONFORMS TO: ASME
SEC. II, 20 10 EDITION , 20__ ADDENDA
MAR 12 2012
By

ITEM NO.	MATERIAL CHARGE NO.		CHEMICAL COMPOSITION % C x100	Si x100	Mn x100	P x1000	S x1000	Cu x100	Ni x100	Cr x100	Mo x100	V x100	Nb x1000	PHYSICAL TEST Y S KSI	T S KSI	E %	C.E. X100
	STANDARD	MIN.		10	29									35.0	60.0		
		MAX.	30		135	50	58	40	40	40	15	8	20		95.0		50
1	910106		19	20	44	7	10	14	4	3	1	1	<1	48.6	68.0	36.0	28
2	310275		20	22	55	7	1	6	3	3	1	<1	<1	46.9	66.3	37.5	30
3	006251		18	21	94	11	7	7	3	3	2	1	3	45.4	69.0	34.2	35
4	908300		19 ✓	26 ✓	47 ✓	20 ✓	9 ✓	2 ✓	1 ✓	2 ✓	1 ✓	1 ✓	<1	66.2 ✓	77.0 ✓	36.2 ✓	27
5	313787		17	21	53	6	3	7	4	3	2	<1	<1	43.8	66.7	33.1	27
6	J6L4981		11	25	128	13	3	2	2	10	<1	<1	1	48.3	70.9	39.6	34
7	J5K4543		12	22	131	18	3	2	2	6	1	<1	<1	50.8	71.8	38.8	35

(NOTE): A: HOT FORMED WITH FINAL TEMPERATURE BETWEEN 620℃-980℃,AIR COOLING.
N: NORMALIZING AT TEMPERATURE 880℃X0.5HR,AIR COOLING.
NACE MR-01-75-03/ISO15156.2 & NACE MR 0103-03 : SATISFACTORY

WE HEREBY CERTIFY THAT THE PRODUCT DESCRIBED HEREIN HAS BEEN MANUFACTURED IN ACCORDANCE WITH THE SPECIFICATIONS CONCERNED AND ALSO WITH THE PURCHASER'S REQUIREMENTS AND THAT THE TEST RESULTS SHOWN HEREIN ARE CORRECT.

Ou C Lan

MANAGER OF Q.A. DEPT.

16

P1378 1076958

CLIENTE / Customer / Clien

CE FRANKLIN LTD.
1900-300-5TH AVENUE S.W.
CALGARY, ALBERTA, T2P 3C4
CANADA

CERTIFICADO DE INSPECCION

Inspection Certificate - Certificat de Réception

DIN EN 10204 / 3.1
ISO 10474 / 3.1

FECHA / Date: **31/08/2011**
N.º / No.: **140982**
HOJA / Page: **1**

SGI 1922164 SGI 6000238 BGI 8009987

ULMA FORJA, S.COOP.
Bº Zubillaga, 3 - Apdo. 1
20560 OÑATI (Gipuzkoa) SPAIN
Tel.: 34 - 943 780552
Fax: 34 - 943 781808
E-mail: ulma@ulmapiping.com

PRODUCTO / Article - Produi: **FLANGES**

SU PEDIDO N.º / Your Order No. / Votre Cde. N.º: **2753332-OR-2100**

DE / of. - de: **23/03/2011**

Certified acc. PED 97/23/EC+AD2000-W(
by TÜV Rheinlanc
N.º 01 202 E/Q 02 744

NORMAS APLICABLES / Requirements - Normes Applicable: **ASME B16.5-09**

MATERIAL CORRESPONDIENTE / Material Correspondent - Qualit: **ASTMA105N-10**
ASME SA105N-10

MODO DE FUSION (*) / Steel Making - Elaboration de l'acie: **NACEMR0175/ISO15156-2 Region 3-2003**
NACE MR0103 : 2007
CSA-Z245.12-09 GR248 CAT I - SS
E = Elec. Y = Oxígeno básic

MARCA DEL FABRICANTE / Mark of factory / Marque du fabrican: **86135**

DEPARTAMENTO / Section / Départemen: **QUALITY ASSURANCE**

PARTIDA / Item / Poste	CANTIDAD / Quantity / Quantité	DESCRIPCION / Description / Description	OBSERVACIONES / Remarks / Observations (*)	COLADA N.º / Heat No / N.ºCoulée	RESISTENCIA / T.Strength / Resist Rupt N/mm2	LIMITE ELAST / Y.Strength 0.2 % N/mm2	ALARGAM. / Elongation / Allongement Lo: 4 d %	ESTRICCION / Red. Area / Striction %	RESILIENCIA / Impact test / Résilience / Joules PROBETA - SPECIMEN: MEDIA / Average / Moyenne	°C	DUREZA / Hardness / Dureté HB
1 1075274	42	BLIND 10 150LB RF A105N	NE	451A1	518	315	29,40	55,30			150 157
11 1073754	72	BLIND 6 600LB RF A105N	NE	423T1	515	302	29,30	52,60			150 157
47 1075514	1.568	WN 4 150LB STD/40 RF A105N	NE	944T0	518	301	28,50	52,30			150 157
49 1069481	210	WN 6 150LB STD/40 RF A105N	NE	443T1	517	304	30,20	57,60			150 158
61 1074781	720	WN 2 300LB S80 RF A105N	NE	283A1	514	312	31,50	56,30			150 156
61 1074781	360	WN 2 300LB S80 RF A105N	NE	443T1	517	304	30,20	57,60			150 158
98 1072284	8	WN 6 900LB S160 RF A105N	NE	452A1	518	315	29,40	55,30			150 157

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

COLADA N.º / Heat No / N.ºCoulée	C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	Nb %	V %	Cu %	Al %	Ti %	N %	CEq %
283A1	0,180	0,160	1,020	0,005	0,008	0,060	0,100	0,030	0,002	0,002	0,120	0,020	0,000	0,000	0,383
423T1	0,190	0,200	0,860	0,014	0,008	0,070	0,130	0,020	0,004	0,002	0,320	0,000	0,000	0,000	0,382
443T1	0,190	0,180	0,830	0,010	0,017	0,060	0,110	0,020	0,003	0,001	0,320	0,000	0,000	0,000	0,373
451A1	0,200	0,240	0,890	0,011	0,001	0,110	0,090	0,040	0,001	0,002	0,240	0,028	0,000	0,000	0,401
452A1	0,200	0,240	0,890	0,011	0,001	0,110	0,090	0,040	0,001	0,002	0,240	0,000	0,000	0,000	0,401
944T0	0,210	0,160	0,850	0,015	0,016	0,040	0,080	0,010	0,001	0,001	0,290	0,000	0,000	0,000	0,387

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

- Los materiales citados cumplen las normas aplicable
- Manufacturing requirements are satisfiec
- Les normes applicables sont respectées

EL INSPECTOR
Works Inspector - L'Inspecteu

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

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

CRIMTECH SERVICES LTD.
MATERIAL CONFORMS TO: ASME
SEC. II, 2010 EDITION, 20__ ADDENDA
FEB 22 2012
By: OH
P.O. No.

18

P.R. 3 ERP 1004503

PO# 4829365-CC

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

MILL TEST CERTIFICATE

EN10204-3.1.B(DIN50049/3.1.B)
Customer SEYBOLD INTERNATIONAL CORP
Order No. 7003964(1)-CCTF

Certificate No.: SE-3964A
Date 05/16/2011
Page 1 OF 1

PRODUCT	MATERIAL SPECIFICATIONS	DIMENSIONAL SPECIFICATIONS
FORGED CARBON STEEL FLANGES	ASTM A105-10a/ASME SA105-10a	ASME B16.5-09 CSA Z245.12

Item No.	CODE NO	DESCRIPTION	QUANTITY	CHEMICAL COMPOSITION (%) C	Si	Mn	P	S	Cu	Cr	Ni	Mo	V	Nb	N			CE(*3)
			Min	-	0.100	0.600	-	-	-	-	-	-	-	-	-			
			Max	0.350	0.350	1.050	0.035	0.040	0.400	0.300	0.400	0.120	0.080	0.020	-			
1	7533608	150 WNRF S160 4" A105N	200 PCE	0.210	0.180	1.070	0.007	0.010	0.050	0.040	0.030	0.006	0.003	0.005	0.009			0.403
2	7535236	150 SORF 6" A105N	200 PCE	0.210	0.210	1.150	0.016	0.004	0.006	0.020	0.010	0.001	0.003	0.001	0.006			0.407
3	7535775	150 BLRF 8" A105N	140 PCE	0.200	0.300	0.870	0.010	0.008	0.180	0.110	0.200	0.030	0.001	0.006	0.007			0.398
4	7535830	150 BLRF 20" A105N	12 PCE	0.200	0.190	1.140	0.018	0.011	0.160	0.120	0.060	0.020	0.002	0.002	0.009			0.433
5	7534655	300 WNRF STD 4" A105N	400 PCE	0.200	0.210	1.170	0.020	0.004	0.006	0.020	0.010	0.005	0.003	0.001	0.006			0.401
6	7536348	300 SORF 24" A105N	12 PCE	0.180	0.120	1.110	0.021	0.003	0.008	0.200	0.010	0.002	0.004	0.001	0.007			0.407

Item No.	Heat No	T.S.(*1) (MPA)	Y.S.(*1) (MPA)	E.L.(*1) (%)	Hardness (HB)	R.A.(*1) (%)	Impact Test Temp. Minimum Joule 1	2	3	Material Supplier	HEAT TREATMENT(*2) ☒ N REMARKS
Min		485.0	250.0	22.0	-	30.0					
Max		-	-	-	187	-					
1	31079	515.8	333.4	36.4	155/152	68.6				OEMK	880°C X3HRS
2	4390793	525.6	371.7	37.4	150/153	71.3				ACOMINAS	CONFORMS WITH NACE MR0103-07 AND NACE MR0175/ISO15156.2
3	58051	513.9	315.8	33.2	157/153	66.8				RED OCTOBER	CONFORMS WITH Z245.12 CAT I GR.248 SOUR SERVICE-05
4	278362	525.6	361.9	33.6	152/154	70.4				SEAH BESTEEL	TEST SPECIMEN ORIENTATION TRANSVERSE
5	4390809	513.9	352.1	36.0	151/150	69.5				ACOMINAS	
6	4316236	501.1	327.5	37.4	150/147	74.6				ACOMINAS	

*1. T.S. = Tensile Strength, Y.S.=Yield Strength, E.L.=Elongation, R.A.=Reduction of Area

*2 N=Normalized, A=Annealed, Q=Quenched, T=Tempered, S.T=Solution Treated, S.R=Stress Relieved
A.C=Air Cooled, F.C=Furance Cooled, W.C=Water Cooled, O.C=Oil Cooled

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

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

Manager of Quality Assurance Dep't

CRIMTECH SERVICES LTD.
MATERIAL CONFORMS TO: ASME
SEC. II, 20 10 EDITION, 20__ ADDENDA
MAR 12 2012
By:
P.O. No.

24

F.378 ERP 1000049 T.156

S40/STD

HENGYANG VALIN STEEL TUBE CO., LTD

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

MILL TEST REPORT

(ACCORDING TO EN10204 3.1)

CUSTOMER	CE FRANKLIN			CERTIFICATE NO.	C201129448-1
CONTRACT NO.	2110002087-4	P.O.NO.	PO.2755277-OR-2100-B (LOT E)	L/C NO.: 1FAHD5-00307	DATE: 2011-10-19 PAGE: 1/3
PRODUCT	SEAMLESS CARBON STEEL PIPE FOR OIL AND GAS USE.			DELIVERY CONDITION	HR
SPECIFICATION	SEE SPECIFICATION NOTE			HEAT TREATMENT	
GRADE	B,X42,GRADE 290			DIMENSIONS(mm)	2" * 0.154" * 20FT
TOTAL BUNDLES:	13	TOTAL PIECES:	737	TOTAL LENGTH: 14749.660 FEET	TOTAL WEIGHT: 24.454 MT

NO.	LOT No.	HEAT No.	BUNDLES	PIECES	LENGTH M	WEIGHT MT / W1	TENSILE TEST ASTM A370 SAMPLE TYPE/ ORIENTATION / SIZE(mm/GAUGE LENGTH(mm):S\L\19\50 TS(MPa)	YS(MPa)	Rp0.2	EL(%)	R.A. (%)	YS/TS	COLD BENDING TEST
Max													
Min													
1	919402104	1126289V	6	316	6324.140	10.485	482	376		33		0.8	ACCEPTABLE
2	919402105	1126288V	7	421	8425.520	13.969	494	384		32		0.8	ACCEPTABLE

NO.	IMPACT TEST NOTCH TYPE/ORIENTATION/TEMPERATURE/SIZE (mm): AK1 (J)	Av. (J)	% SHEAR AREA	LE	AK2 (J)	Av. (J)	% SHEAR AREA	LE	NON METALIC INCLUSION	GRAIN SIZE	HARDNESS TEST NACE MR0175 HRC ≤22
Max											
Min											
1			//	//	//			//			/1.0/
2			//	//	//			//			/1.0/

CRIMTECH SERVICES LTD.
MATERIAL CONFORMS TO: ASME
SEC. II, 20 10 EDITION, 20 __ ADDENDA
MAR 12 2012
By: CH
No.

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

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HENGYANG VALIN STEEL TUBE CO., LTD

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

MILL TEST REPORT

(ACCORDING TO EN10204 3.1)

CUSTMER	CE FRANKLIN			CERTITICATE NO.	C201129448-1
CONTRACT NO.	2110002087-4	P.O.NO.	PO.2755277-OR-2100-B (LOT E) L/C NO.: 1FAHD5-00307	DATE :	2011-10-19 PAGE: 2/3
PRODUCT	SEAMLESS CARBON STEEL PIPE FOR OIL AND GAS USE.			DELIVERY CONDITION	HR
SPECIFICATION	SEE SPECIFICATION NOTE		HEAT TREATMENT		
GRADE	B,X42,GRADE 290			DIMENSIONS(mm)	2" * 0.154" * 20FT
TOTAL BUNDLES:	13	TOTAL PIECES:	737	TOTAL LENGTH: 14749.660 FEET	TOTAL WEIGHT : 24.454 MT

NO.	HEAT No. / LOT No.	P	Type	CHEMICAL COMPOSITION (%) C *100	Si	Mn	Cr	Mo	W	Cu	Ni	P *1000	Al	Sn	As	Pb	Sb	Nb	Ti	Zr	N	Bi	S *10000	V	B	Ca	CEIIW *100	CEPCM	SUM1 *1000	SUM2	SUM3	R1	R2	R3
			Max																														
			Min																														
1	1126289V			12	25	107	7	2		7	3	12						28	24				20	29	1			19	193					8.9
	919402104			12	24	107	5	2		7	3	12						28	25				20	28	1			19	173					8.9
	919402104			12	25	106	5	2		7	3	12						28	25				20	28	1			19	173					8.8
2	1126288V			11	25	104	6	2		7	3	14						26	23				23	26	1			18	183					9.5
	919402105			11	25	104	5	2		7	3	14						26	24				22	24	1			18	172					9.5
	919402105			11	24	104	5	2		7	3	14						26	24				22	24	1			18	172					9.5

NON-DESTRUCTIVE TEST			
POSITION	PIPE BODY	PIPE END	
NDT Type(Level)	ET		N/A
			VISUAL & DIMIMENSION
LAMINAR	N/A		ACCEPTABLE
TEST RESULT	ACCEPTABLE	N/A	COATING
RESIDUAL MQGNETISM		ACCEPTABLE	
UT THICKNESS MEASUREMENT (50%)		N/A	
HYDROSTATIC TEST Min(psi)	3000	ACCEPTABLE	N/A

NOTES: H--HEAT ANALYSIS P--PRODUCT ANALYSIS CE--EQUIVALENT CARON R--RATIO R1=Ca /S R2=Al /N R3=Mn /C

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

CEPCM=C+Si/30+(Mn+Cr+Cu)/20+Ni/60+Mo/15+V/10+5*B

SUM1=Cr+Cu+Mo+Ni+V SUM2=Nb+V SUM3=Nb+V+Ti

L4--ACCEPT LEVEL L4,NOTCH DEPTH IS 12.5% THE SPECIFIED WALL THICKNESS. L2--ACCEPT LEVEL L2,NOTCH DEPTH IS 5% THE SPECIFIED WALL THICKNESS.

HENGYANG VALIN STEEL
TUBE CO., LTD

MILL TEST REPORT

(ACCORDING TO EN10204 3.1)

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

CUSTOMER	CE FRANKLIN			CERTIFICATE NO.	C201129448-1
CONTRACT NO.	2110002087-4	P.O.NO.	PO.2755277-OR-2100-B (LOT E) L/C NO.: 1FAHD5-00307	DATE: 2011-10-19	PAGE: 3/3
PRODUCT	SEAMLESS CARBON STEEL PIPE FOR OIL AND GAS USE.			DELIVERY CONDITION	HR
SPECIFICATION	SEE SPECIFICATION NOTE		HEAT TREATMENT		
GRADE	B,X42,GRADE 290			DIMENSIONS(mm)	2" * 0.154" * 20FT
TOTAL BUNDLES:	13	TOTAL PIECES:	737	TOTAL LENGTH: 14749.660 FEET	TOTAL WEIGHT : 24.454 MT

REMARK :

SPECIFICATION NOTE	ASTM A53B/A106B-2010, ASME SA53B/SA106B-2010, API 5LB/X42, PSL-2-2008, NACE MR-0175-2009/ISO 15156-2-2005(REGION 3)/MR-0103/SS (CSA Z245.1 GRADE 241/290 CATEGORY I-2007)

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

This certificate is issued by a computerized system and it is valid with electroic signature. On the original certificate the trade-mark JOINTIME light-green coloured at the bottom of the page is stamped .In case the owner of the certificate would relea

Any alteration and or falsification wil be subject to the law.

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

CUSTOMER THIRD PARTY

Quality Manager:

HENGYANG VALIN STEEL TUBE CO., LTD 衡阳华菱钢管有限公司 HUNAN CHINA

Certificate-maker: 倪小平

P 137R ERP 1003884

INSPECTION CERTIFICATE

TO EN10204 3.1

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

Purchaser : CE Franklin Ltd

E-No. MC-502 | Purchase Order No. P/O 2825882-OR-2100 | Job No. | D M Y 09/01/2012 | Certificate No. T- 2012200032

No.	Purchase Actual data	MFG. No.	Specification for Material Made from Seamless Pipe	Specification for Inspection	Visual Examination	Dimensional Inspection
			ASTM A234-11/ASME SA234-10 Gr.WPB CSA Z245-11-09 Gr.241 CAT1 SS NACE MR0175/ISO 15156-2 R3-09&MR0103-10	ASME B16.9-2007,B16.25-2007	Good	Good
			Product & Size (T:*1)	Quantity	Heat Treatment (Note 1)	Boron(%)	Item No.
1	HB:120-124	54G00105	90 EL WPB 6 STD	4/325	A	0.0001	7510462
2	HB:120-126	54G00108	90 EL WPB 2 XS	159/2,000	A	<0.0001	7510900
3	HB:120-128	54G20119	RC WPB 8 X 6 STD	14/120	N	0.0001	7513640
4	HB:122-133	54G00105-1	90 EL WPB 6 STD	321/325	A	<0.0001	7510462
5	HB:139-149 ✓	54G00102	90 EL WPB 2 STD	1,750	A	<0.0001	7510346

Specification		Chemical Composition %												Tension Test *2			
		C x100	Si x100	Mn x100	P x1000	S x1000	Cu x100	Ni x100	Cr x100	Mo x100	V x1000	Nb x1000	C.E. x100	YS MPa.	TS MPa.	E %	HARDNESS MAX
Min.														240	415	30	197 HB : GOOD ✓
Max.		30		106	50	58	40	40	40	15	80	20			655		
Material Heat No.																	
1	06426	18	20	79	11	3	3	3	6	1	TR	TR	33	297	477	38	
2	22974K	17	19	69	10	4	7	3	4	0.4	<3	<3	30	305	466	33	
3	J1LA947	19	21	78	19	8	2	3	5	1	TR	TR	34	310	484	46	
4	969097	16	18	78	12	3	15	7	18	5	TR	TR	35	298	490	35	
5	770462	15 ✓	17 ✓	74 ✓	19 ✓	4 ✓	15 ✓	7 ✓	15 ✓	2 ✓	TR	TR	32	346 ✓	530 ✓	31 ✓	

CRIMTECH SERVICES LTD.
MATERIAL CONFORMS TO: ASME
SEC. II, 2010 EDITION, 20__ ADDENDA
MAR 12 2012
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° Cx0.5 HR. Air Cooling

The fittings was manufactured,sampled,tested,and inspected in accordance with the specification, and was found to meet the requirements

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.

* 1 : "T" symbolized wall thickness in mm. * 2 : YS Yield strength TS = Tensile strength E = Elongation

1000860

t=.218 P1378

HENGYANG VALIN STEEL
TUBE CO., LTD

MILL TEST REPORT

(ACCORDING TO EN10204 3.1)

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

CUSTOMER	CE FRANKLIN			CERTIFICATE NO.	C201129512-2
CONTRACT NO.	2110002087-4	P.O.NO.	PO.2755277-OR-2100-B (LOT E) L/C NO.: 1FAHD5-00307	DATE: 2011-10-19	PAGE: 1/3
PRODUCT	SEAMLESS CARBON STEEL PIPE FOR OIL AND GAS USE.			DELIVERY CONDITION	HR
SPECIFICATION	SEE SPECIFICATION NOTE		HEAT TREATMENT		
GRADE	B,X42,GRADE 290			DIMENSIONS(mm)	3" * 0.216" * 20FT
TOTAL BUNDLES: 7	TOTAL PIECES: 230	TOTAL LENGTH: 4603.040 FEET		TOTAL WEIGHT: 15.839 MT	

NO.	LOT No.	HEAT No.	BUNDLES	PIECES	LENGTH FEET	WEIGHT MT W1	TENSILE TEST ASTM A370 SAMPLE TYPE/ ORIENTATION / SIZE(mm/GAUGE LENGTH(mm):S\L\19\50 TS(MPa)	YS(MPa)	Rp0.2	EL(%)	R.A. (%)	YS/TS	FLATTENING TEST
Max													
Min													
6	919402213	1126280V	5	185	3702.45	12.740	451	329		31.5		0.7	ACCEPTABLE
7	919402214	1126074V	2	45	900.59	3.099	466	357		39.5		0.8	ACCEPTABLE

NO.	IMPACT TEST NOTCH TYPE/ORIENTATION/TEMPERATURE/SIZE (mm): AK1 (J)	Av. (J)	% SHEAR AREA	LE	AK2 (J)	Av. (J)	% SHEAR AREA	LE	NON METALIC INCLUSION	GRAIN SIZE	HARDNESS TEST NACE MR0175 HRC ≤22
Max											
Min											
6			//	//	//			//			
7			//	//	//			//			

CRIMTECH SERVICES LTD.
MATERIAL CONFORMS TO: ASME /1.0/
SEC. II. 20 10 EDITION, 20__ ADDENDA /1.0/
FEB 22 2012
By:
P.O. No.

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

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HENGYANG VALIN STEEL TUBE CO., LTD

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

MILL TEST REPORT

(ACCORDING TO EN10204 3.1)

CUSTMER	CE FRANKLIN			CERTITICATE NO.	C201129512-2
CONTRACT NO.	2110002087-4	P.O.NO.	PO.2755277-OR-2100-B (LOT E) L/C NO.: 1FAHD5-00307	DATE: 2011-10-19	PAGE: 2/3
PRODUCT	SEAMLESS CARBON STEEL PIPE FOR OIL AND GAS USE.			DELIVERY CONDITION	HR
SPECIFICATION	SEE SPECIFICATION NOTE		HEAT TREATMENT		
GRADE	B,X42,GRADE 290			DIMENSIONS(mm)	3" * 0.216" * 20FT
TOTAL BUNDLES:	7	TOTAL PIECES:	230	TOTAL LENGTH: 4603.040 FEET	TOTAL WEIGHT: 15.839 MT

NO.	HEAT No. / LOT No.	Type	CHEMICAL COMPOSITION (%)																														
			C	Si	Mn	Cr	Mo	W	Cu	Ni	P	Al	Sn	As	Pb	Sb	Nb	Ti	Zr	N	Bi	S	V	B	Ca	CEIIW	CEPCM	SUM1	SUM2	SUM3	R1	R2	R3
			*100								*1000											*10000				*100		*1000						
	P	Max																															
		Min																															
	1126280V		11	22	103	5	1		7	2	12						26	25				20	26	1			18	153					9.4
6	919402213		11	22	101	5	1		6	2	11						25	24				18	28	1			18	143					9.2
	919402213		✓10	✓21	✓100	✓5	✓1		✓6	✓2	✓11						25	24				✓18	✓28	✓1			16	143					10.0
	1126074V		11	27	109	6	2		7	2	13						28	25				25	32	1			18	173					9.9
7	919402214		12	26	108	5	1		6	2	13						26	25				20	30	1			19	143					9.0
	919402214		11	25	107	5	1		6	2	13						26	25				20	30	1			18	143					9.7

NON-DESTRUCTIVE TEST

POSITION	PIPE BODY	PIPE END	
NDT Type(Level)	ET		N/A
			VISUAL & DIMIMENSION
LAMINAR	N/A		ACCEPTABLE
TEST RESULT	ACCEPTABLE	N/A	COATING
RESIDUAL MQGNETISM		ACCEPTABLE	
UT THICKNESS MEASUREMENT (50%)		N/A	
HYDROSTATIC TEST Min(psi)	3000	ACCEPTABLE	N/A

NOTES: H--HEAT ANALYSIS P--PRODUCT ANALYSIS CE--EQUIVALENT CARON R--RATIO R1=Ca /S R2=Al /N R3=Mn /C

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

CEPCM=C+Si/30+(Mn+Cr+Cu)/20+Ni/60+Mo/15+V/10+5*B

SUM1=Cr+Cu+Mo+Ni+V SUM2=Nb+V SUM3=Nb+V+Ti

L4--ACCEPT LEVEL L4,NOTCH DEPTH IS 12.5% THE SPECIFIED WALL THICKNESS. L2--ACCEPT LEVEL L2,NOTCH DEPTH IS 5% THE SPECIFIED WALL THICKNESS.

HENGYANG VALIN STEEL
TUBE CO., LTD

MILL TEST REPORT

(ACCORDING TO EN10204 3.1)

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

CUSTOMER	CE FRANKLIN			CERTIFICATE NO.	C201129512-2
CONTRACT NO.	2110002087-4	P.O.NO.	PO.2755277-OR-2100-B (LOT E) L/C NO.: 1FAHD5-00307	DATE: 2011-10-19	PAGE: 3/3
PRODUCT	SEAMLESS CARBON STEEL PIPE FOR OIL AND GAS USE.			DELIVERY CONDITION	HR
SPECIFICATION	SEE SPECIFICATION NOTE		HEAT TREATMENT		
GRADE	B,X42,GRADE 290			DIMENSIONS(mm)	3" * 0.216" * 20FT
TOTAL BUNDLES:	7	TOTAL PIECES:	230	TOTAL LENGTH: 4603.040 FEET	TOTAL WEIGHT : 15.839 MT

REMARK :

SPECIFICATION NOTE	ASTM A53B/A106B-2010, ASME SA53B/SA106B-2010, API 5LB/X42, PSL-2-2008, NACE MR-0175-2009/ISO 15156-2-2005(REGION 3)/MR-0103/SS (CSA Z245.1 GRADE 241/290 CATEGORY I-2007)

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

This certificate is issued by a computerized system and it is valid with electroic signature. On the original certificate the trade-mark JOINTIME light-green coloured at the bottom of the page is stamped .In case the owner of the certificate would relea

Any alteration and or falsification wil be subject to the law.

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

CUSTOMER THIRD PARTY

Quality Manager:

HENGYANG VALIN STEEL TUBE CO., LTD. 衡阳华菱钢管有限公司 HUNAN CHINA

Certificate-maker: 倪小平

P1378
EEP 1004797

INSPECTION CERTIFICATE

TO EN10204 3.1

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

Purchaser : CCTF CORPORATION

E-No. MC-375 | Purchase Order No. 4899506 | Job No.

D M Y Certificate No.
27/08/2011 T- 2011200605

No.		MFG. No.	Specification for Material Made from Seamless Pipe ASTM A234-11/ASME SA234-10 Gr.WPB CSA Z245.11-09 Gr.241 CAT 1 SS NACE MR0175/ISO 15156-2:09&MR0103-10	Specification for Inspection ASME B16.9-2007, B16.25-2007	Visual Examination	Dimensional Inspection
					Good	Good
			Product & Size (T:*1)	Quantity	Heat Treatment (Note 1)	Hardness Actual Data / Item No.
1	117305	11F20015	RC WPB 4 X 2 S40	25	N	HB : 125 - 140 / 7513372
2	117304	07M20204	RC WPB 12 X 6 STD	1/5	N	HB : 115 - 145 / 7513828
3	117132	07C20060	RC WPB 16 X 12 STD	3	N	HB : 130 - 147 / 7511124
4	117251	11F20026	RC WPB 12 X 10 STD	25/40	N	HB : 130 - 145 / 7513901
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.		%	HARDNESS MAX
Max.			10	29										240	415	30	197 HB : GOOD
Material Heat No.		30		106	50	58	40	40	40	15	80	20			655		
1	06426	18	20	79	11	3	3	3	6	1	0	0	33	302	470	36	
2	J7K2343	10	29	130	14	4	3	2	11	0	0	0	34	324	468	50	
3	J7L1109	19	18	71	22	8	2	2	8	1	0	0	32	310	475	45	
4	1-81184	19	24	83	17	4	<1	1	2	<1	<1	<1	33	306	464	48	
5																	

CRIMTECH SERVICES LTD.
MATERIAL CONFORMS TO: ASME
SEC. II, 20 10 EDITION, 20__ ADDENDA
MAR 1 2 2012
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° Cx0.5 HR. Air Cooling

The fittings was manufactured,sampled,tested,and inspected in accordance with the specification,and was found to meet the requirements

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.

* 1 : "T" symbolized wall thickness in mm. * 2 : YS Yield strength TS = Tensile strength E = Elongation

Form TZ-6A/2

P 1378 ERP 1004135

METALFAR
PRODOTTI INDUSTRIALI S.P.A.
STAMPAGGIO A CALDO DI ACCIAI COMUNI - LEGATI E INOSSIDABILI
SALA PROVE E ANALISI MATERIALI / MATERIAL TEST DEPARTMENT

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

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

CERTIFICATO DI COLLAUDO SECONDO EN 10204 - 3.1 INSPECTION CERTIFICATE

FORGED FLANGES & FITTINGS LTD
CASTLE HOUSE - STATION ROAD
EN5 1PE NEW BARNET/HERTFORD... GB

Certif. N. 5291 Del/Dated 02.11.2011
Fattura / Invoice N. 3554 Del/Dated 28.10.2011
DDT / Del Note N. 4030 Del/Dated 28.10.2011
Ns.Ord. / Our ref. N. Del/Dated

COD. COL. COLATA HEAT CODE HEAT	POS. ITEM	VS.ORDINE YOUR REFERENCE	Q.TA' Q.TY	DESCRIZIONE DESCRIPTION
10/33382	034	3798G/FR	200,00	W/N 300 RF 2" STD A105

DIM.IN ACC. A
DIM. ACCORDANCE TO
ASME/ANSI B16.5 -2009

VISIVO E DIMENS.
VIS. & DIMENS.
SATISFACTORY

MATERIALE / MATERIAL
ASTM A105

C%	Si%	Mn%	S%	P%	Cr%	Ni%	Mo%	Ti%	Cu%	V%	Nb%	N%	Al%	C.E.%	B %
0,190	0,230	1,160	0,010	0,014	0,100	0,050	0,010	0,017	0,160	0,000	0,000	0,000	0,027	0,419	0,000

PROVETTA / TEST SPECIMEN SEZ. mm2 SECT. mm2	LUNG. mm LENGHT mm	FORMA SHAPE 1= O 2=□	SNERVAMENTO YIELD POINT N/mm2 >=0,2%	ROTTURA TENSILE STRENGHT N/mm2 >=	ALLUNGAMENTO ELONGATION %>=	CONTRAZIONE REDUCTION OF AREA %>=	DUREZZA HARDNESS HBW
126,60	50,80	1	346,0	538,0	30,0	60,0	163,0 - 165,0

RESILIENZA / IMPACT TEST - JOULE/cm2

TIPO / TYPE 10x10mm	°C	1	2	3	SNERVAMENTO YIELD POINT N/mm2 >=1,0%
KV	20	89	89	83	0,0

Ns.Rif. OUR REF.

MATERIALE IN ACCORDO A / MATERIAL IN ACC. TO
ASTM/ASME A 105/SA 105 M - 10 ASME CODE SECT. II, PART A, ED. 2010
CSA CAN3 Z-245.12-09 GRADE 248 CAT.I SOUR SERVICE

TRATTAMENTO TERMICO / HEAT TREATMENT
NORMALIZED AT 920 C - COOLED IN STILL AIR

FORNO / FURNACE
ELECTRIC FURNACE

ORIGINE / ORIGIN
EUROPE

CRIMTECH SERVICES LTD.
MATERIAL CONFORMS TO: ASME
SEC. II, 20 10 EDITION, 20__ ADDENDA
MAR 12 2012
By: GH
P.O. No.

NOTE NOTES	UFFICIO CONTROLLO QUALITA' QUALITY CONTROL DEPARTEMENT	ENTE UFFICIALE DI COLLAUDO INSPECTION AUTHORITY	MARCHIO PRODUZIONE MANUFACTURER'S SYMBOL
MANUFACTURING IN ACCORDANCE WITH ORDER AND SPECIFICATION MATERIAL IN ACCORDANCE WITH NACE MR-0175/2003 ISO 15156-2009 - SOUR SERVICE MATERIAL IN ACCORDANCE WITH NACE MR-0103/2010 - SOUR SERVICE	S. Corti		MFF

1.578 ERP 1004503

CERTIFICATO DI COLLAUDO SECONDO EN 10204 - 3.1 INSPECTION CERTIFICATE

ETALFAR
PF DOTTI INDUSTRIALI S.P.A.
STAMPAGGIO A CALDO DI ACCIAI COMUNI - LEGATI E INOSSIDABILI

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

SALA PROVE e ANALISI MATERIALI / MATERIAL TEST DEPARTMENT

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

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

Certif. N. 5145 Del/Dated 18.12.2010
Fattura / Invoice N. 3575 Del/Dated 17.12.2010
DDT / Del Note N. 6733 Del/Dated 17.12.2010
Ns.Ord. / Our ref. N. Del/Dated

COD. COL. / HEAT CODE: COLATA / HEAT: 10/30230 — POS. / ITEM: 032 — VS.ORDINE / YOUR REFERENCE: 654/FR — Q.TA' / Q.TY: 150,00 — DESCRIZIONE / DESCRIPTION: W/N 300 RF 4" STD A105

DIM.IN ACC. A / DIM. ACCORDANCE TO: ASME/ANSI B16.5

VISIVO E DIMENS. / VIS. & DIMENS.: SATISFACTORY

MATERIALE / MATERIAL: ASTM A105

C%	Si%	Mn%	S%	P%	Cr%	Ni%	Mo%	Ti%	Cu%	V%	Nb%	N%	Al%	C.E.%	B %
0,190	0,240	1,110	0,006	0,011	0,080	0,040	0,010	0,018	0,090	0,003	0,003	0,000	0,026	0,402	0,000

PROVETTA / TEST SPECIMEN SEZ. mm2 / SECT. mm2	LUNG. mm / LENGHT mm	FORMA / SHAPE 1=○ 2=□	SNERVAMENTO / YIELD POINT N/mm2 >=0,2%	ROTTURA / TENSILE STRENGHT N/mm2 >=	ALLUNGAMENTO / ELONGATION %>=	CONTRAZIONE / REDUCTION OF AREA %>=	DUREZZA / HARDNESS HB
126,60	50,80	1	346,0	533,0	31,0	58,0	163,0 - 165,0

RESILIENZA / IMPACT TEST - JOULE/cm2

TIPO / TYPE 10x10mm	°C	1	2	3	SNERVAMENTO / YIELD POINT N/mm2 >=1,0%
KV	20	80	80	86	0,0

Ns.Rif. / OUR REF.

MATERIALE IN ACCORDO A / MATERIAL IN ACC. TO: ASTM/ASME A 105/SA 105 M - 09 CSA CAN3 Z-245.12-05 GRADE 248 CAT.I

TRATTAMENTO TERMICO / HEAT TREATMENT: NORMALIZED AT 920 C - COOLED IN STILL AIR

FORNO / FURNACE: ELECTRIC FURNACE

ORIGINE / ORIGIN: EUROPE

COD. COL. / HEAT CODE: COLATA / HEAT: 10/31378 — POS. / ITEM: 052 — VS.ORDINE / YOUR REFERENCE: 654/FR — Q.TA' / Q.TY: 615,00 — DESCRIZIONE / DESCRIPTION: W/N 150 RF 2" XS LF2CL1

DIM.IN ACC. A / DIM. ACCORDANCE TO: ASME/ANSI B16.5

VISIVO E DIMENS. / VIS. & DIMENS.: SATISFACTORY

MATERIALE / MATERIAL: ASTM A350 LF2 CL1/2

C%	Si%	Mn%	S%	P%	Cr%	Ni%	Mo%	Ti%	Cu%	V%	Nb%	N%	Al%	C.E.%	B %
0,180	0,230	1,120	0,010	0,010	0,070	0,060	0,010	0,019	0,140	0,003	0,000	0,000	0,030	0,397	0,000

PROVETTA / TEST SPECIMEN SEZ. mm2 / SECT. mm2	LUNG. mm / LENGHT mm	FORMA / SHAPE 1=○ 2=□	SNERVAMENTO / YIELD POINT N/mm2 >=0,2%	ROTTURA / TENSILE STRENGHT N/mm2 >=	ALLUNGAMENTO / ELONGATION %>=	CONTRAZIONE / REDUCTION OF AREA %>=	DUREZZA / HARDNESS HB
126,60	50,80	1	352,0	522,0	30,0	58,0	159,0 - 163,0

RESILIENZA / IMPACT TEST - JOULE/cm2

TIPO / TYPE 10x10mm	°C	1	2	3	SNERVAMENTO / YIELD POINT N/mm2 >=1,0%
KV	-50	64	66	62	0,0

Ns.Rif. / OUR REF.

MATERIALE IN ACCORDO A / MATERIAL IN ACC. TO: ASTM/ASME A 350/SA 350 M - 07 CSA CAN3 Z-245.12-05 GRADE 290 CAT.II

TRATTAMENTO TERMICO / HEAT TREATMENT: NORMALIZED AT 930 C - COOLED IN STILL AIR

FORNO / FURNACE: ELECTRIC FURNACE

ORIGINE / ORIGIN: EUROPE

CRIMTECH SERVICES LTD.
MATERIAL CONFORMS TO: ASME
SEC. II, 2010 EDITION, 20__ ADDENDA
MAR 1 2 2012
By:
P.O. No.

NOTE / NOTES: MANUFACTURING IN ACCORDANCE WITH ORDER AND SPECIFICATION
MATERIAL IN ACCORDANCE WITH NACE MR-0175/2003 ISO 15156
MATERIAL IN ACCORDANCE WITH NACE MR-0103/2007

UFFICIO CONTROLLO QUALITA' / QUALITY CONTROL DEPARTEMENT	ENTE UFFICIALE DI COLLAUDO / INSPECTION AUTHORITY	MARCHIO PRODUZIONE / MANUFACTURER'S SYMBOL
S. Corti		MFF

P137°
ERP 1004135

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

MILL TEST CERTIFICATE

EN10204-3.1.B(DIN50049/3.1.B)
Customer: SEYBOLD INTERNATIONAL CORP.
Order No.: 7001500(2)-CEF

Certificate No.: SE1500B1
Date: 11/11/2009

PRODUCT	MATERIAL SPECIFICATIONS	DIMENSIONAL SPECIFICATIONS
FORGED CARBON STEEL FLANGES	ASTM A105-05/ASME SA105-07	ASME B16.5-03 CSA Z245.12

Item No.	CODE NO	DESCRIPTION	QUANTITY	CHEMICAL COMPOSITION (%) C	Si	Mn	P	S	Cu	Cr	Ni	Mo	V	Nb	N			CE(*3)
Min				-	0.100	0.600	-	-	-	-	-	-	-	-	-			
Max				0.350	0.350	1.050	0.035	0.040	0.400	0.300	0.400	0.120	0.080	0.020	-			
21	1075039	300 WNRF STD 2" A105N	150 PCE	0.211	0.240	1.000	0.013	0.014	0.006	0.019	0.054	0.002	0.007	0.005	0.004			0.386
22	1069561	300 WNRF XS 1 1/2" A105N	15 PCE	0.230	0.120	1.020	0.008	0.009	0.070	0.040	0.040	0.005	0.003	0.005	0.010			0.416
23	1075207	300 WNRF S160 2" A105N	36 PCE	0.210	0.210	1.150	0.007	0.013	0.040	0.060	0.030	0.009	0.003	0.005	0.011			0.420
24	1075207	300 WNRF S160 2" A105N	14 PCE	0.190	0.200	1.140	0.008	0.011	0.110	0.080	0.070	0.005	0.003	0.005	0.009			0.409
25	1546873	600 WNRF S160 1" A105N	25 PCE	0.230	0.120	1.020	0.008	0.009	0.070	0.040	0.040	0.005	0.003	0.005	0.010			0.416
26	1072111	600 WNRF S160 1 1/2" A105N	15 PCE	0.210	0.210	1.090	0.009	0.014	0.060	0.060	0.040	0.008	0.003	0.005	0.010			0.412
27	1072241	900 WNRF S160 4" A105N	15 PCE	0.180	0.270	0.920	0.016	0.012	0.190	0.130	0.140	0.020	0.003	0.001	0.010			0.385

Item No.	Heat No.	T.S.(*1) (MPA)	Y.S.(*1) (MPA)	E.L.(*1) (%)	Hardness (HB)	R.A.(*1) (%)	Impact Test Temp: Minimum: Joule 1	2	3	Material Supplier
Min		485.0	250.0	22.0	-	30.0				
Max		-	-	-	187	-				
21	931272	509.9	319.7	35.2	154	66.0				NTMK
22	49187	513.9	296.2	33.4	162	67.7				OEMK
23	13145	521.7	317.7	34.4	153	67.7				OEMK
24	29570	491.3	298.1	35.4	150	65.9				OEMK
25	49187	513.9	296.2	33.4	162	67.7				OEMK
26	31057	517.8	335.4	33.6	153	67.7				OEMK
27	64324	509.9	307.9	33.8	148	67.7				RED OCTOBER

■ HEAT TREATMENT(*2)
☒ N

■ REMARKS
880°C X3HRS
CONFORMS WITH NACE MR0103-07 AND NACE MR0175/ISO15156.2
CONFORMS WITH Z245.12 CAT I GR.248 SOUR SERVICE-05
TEST SPECIMEN ORIENTATION: TRANSVERSE

*1: T.S. = Tensile Strength, Y.S.=Yield Strength, E.L.=Elongation, R.A.=Reduction of Area.

*2: N=Normalized, A=Annealed, Q=Quenched, T=Tempered, S.T=Solution Treated, S.R=Stress Relieved, A.C=Air Cooled, F.C=Furance Cooled, W.C=Water Cooled, O.C=Oil Cooled.

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

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

CRIMTECH SERVICES LTD.
MATERIAL CONFORMS TO: ASME
SEC. II, 2010 EDITION ADDENDA
MAR 20 2012
By:
P.O. No.

SAN ENG STEEL FORGING CO., LTD. ★ H.C.J ★ QUALITY ASSURANCE DEP'T

Manager of Quality Assurance Dep't

P178 ERP/1004135

METALFAR
PRODOTTI INDUSTRIALI S.P.A.
STAMPAGGIO A CALDO DI ACCIAI COMUNI - LEGATI E INOSSIDABILI

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

SALA PROVE E ANALISI MATERIALI / MATERIAL TEST DEPARTMENT

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

CERTIFICATO DI COLLAUDO SECONDO EN 10204 - 3.1 INSPECTION CERTIFICATE

GLOBAL GAEL SERVICE LTD Unit 1E, Block 71, The Plaza Nangor Road DUBLIN 12 IE	Certif. N. 434 Fattura / Invoice N. DDT / Del Note N. Ns.Ord. / Our ref. N.	Del/Dated 31.01.2011 Del/Dated Del/Dated Del/Dated

COD. COL. HEAT CODE: — | COLATA HEAT: 09/34585 | POS. ITEM: — | VS.ORDINE YOUR REFERENCE: — | Q.TA' Q.TY: 64,00 | DESCRIZIONE DESCRIPTION: BLIND 600 RF 4" LF2 CL1 | DIM.IN ACC. A / DIM. ACCORDANCE TO: ASME/ANSI B16.5 | VISIVO E DIMENS. / VIS. & DIMENS.: SATISFACTORY

MATERIALE / MATERIAL	C%	Si%	Mn%	S%	P%	Cr%	Ni%	Mo%	Ti%	Cu%	V%	Nb%	N%	Al%	C.E.%	B %
ASTM A350 LF2 CL1/2	0,190	0,240	1,120	0,011	0,007	0,080	0,040	0,010	0,017	0,130	0,021	0,001	0,000	0,026	0,410	0,000

PROVETTA / TEST SPECIMEN SEZ. mm2 SECT. mm2	LUNG. mm LENGHT mm	FORMA SHAPE 1=O 2=□	SNERVAMENTO YIELD POINT N/mm2 >=0,2%	ROTTURA TENSILE STRENGHT N/mm2 >=	ALLUNGAMENTO ELONGATION %>=	CONTRAZIONE REDUCTION OF AREA %>=	DUREZZA HARDNESS HB	RESILIENZA / IMPACT TEST - JOULE/cm2 TIPO / TYPE 10x10mm	°C	1	2	3	SNERVAMENTO YIELD POINT N/mm2 >=1,0%	Ns.Rif. OUR REF.
126,60	50,80	1	387,0	531,0	30,0	61,0	163,0 - 166,0	KV	-50	64	64	66	0,0	

MATERIALE IN ACCORDO A / MATERIAL IN ACC. TO: ASTM/ASME A 350/SA 350 M - 07 CSA CAN3 Z-245.12-05 GRADE 290 CAT.II
TRATTAMENTO TERMICO / HEAT TREATMENT: NORMALIZED AT 930 C - COOLED IN STILL AIR
FORNO / FURNACE: ELECTRIC FURNACE
ORIGINE / ORIGIN: EUROPE

COD. COL. HEAT CODE: — | COLATA HEAT: 10/31377 | POS. ITEM: — | VS.ORDINE YOUR REFERENCE: — | Q.TA' Q.TY: 325,00 | DESCRIZIONE DESCRIPTION: W/N 300 RF 2" STD A105 | DIM.IN ACC. A / DIM. ACCORDANCE TO: ASME/ANSI B16.5 | VISIVO E DIMENS. / VIS. & DIMENS.: SATISFACTORY

MATERIALE / MATERIAL	C%	Si%	Mn%	S%	P%	Cr%	Ni%	Mo%	Ti%	Cu%	V%	Nb%	N%	Al%	C.E.%	B %
ASTM A105	0,190	0,250	1,120	0,010	0,013	0,090	0,060	0,010	0,018	0,150	0,003	0,000	0,000	0,025	0,410	0,000

PROVETTA / TEST SPECIMEN SEZ. mm2 SECT. mm2	LUNG. mm LENGHT mm	FORMA SHAPE 1=O 2=□	SNERVAMENTO YIELD POINT N/mm2 >=0,2%	ROTTURA TENSILE STRENGHT N/mm2 >=	ALLUNGAMENTO ELONGATION %>=	CONTRAZIONE REDUCTION OF AREA %>=	DUREZZA HARDNESS HB	RESILIENZA / IMPACT TEST - JOULE/cm2 TIPO / TYPE 10x10mm	°C	1	2	3	SNERVAMENTO YIELD POINT N/mm2 >=1,0%	Ns.Rif. OUR REF.
126,60	50,80	1	343,0	538,0	30,0	58,0	163,0 - 165,0	KV	20	86	83	83	0,0	

MATERIALE IN ACCORDO A / MATERIAL IN ACC. TO: ASTM/ASME A 105/SA 105 M - 09 CSA CAN3 Z-245.12-05 GRADE 248 CAT.I
TRATTAMENTO TERMICO / HEAT TREATMENT: NORMALIZED AT 920 C - COOLED IN STILL AIR
FORNO / FURNACE: ELECTRIC FURNACE
ORIGINE / ORIGIN: EUROPE

COD. COL. HEAT CODE: — | COLATA HEAT: 09/36588 | POS. ITEM: — | VS.ORDINE YOUR REFERENCE: — | Q.TA' Q.TY: 100,00 | DESCRIZIONE DESCRIPTION: W/N 600 RF 4" XS A105 | DIM.IN ACC. A / DIM. ACCORDANCE TO: ASME/ANSI B16.5 | VISIVO E DIMENS. / VIS. & DIMENS.: SATISFACTORY

MATERIALE / MATERIAL	C%	Si%	Mn%	S%	P%	Cr%	Ni%	Mo%	Ti%	Cu%	V%	Nb%	N%	Al%	C.E.%	B %
ASTM A105	0,180	0,210	0,930	0,015	0,012	0,150	0,120	0,020	0,010	0,180	0,003	0,002	0,000	0,005	0,390	0,000

PROVETTA / TEST SPECIMEN SEZ. mm2 SECT. mm2	LUNG. mm LENGHT mm	FORMA SHAPE 1=O 2=□	SNERVAMENTO YIELD POINT N/mm2 >=0,2%	ROTTURA TENSILE STRENGHT N/mm2 >=	ALLUNGAMENTO ELONGATION %>=	CONTRAZIONE REDUCTION OF AREA %>=	DUREZZA HARDNESS HB	RESILIENZA / IMPACT TEST - JOULE/cm2 TIPO / TYPE 10x10mm	°C	1	2	3	SNERVAMENTO YIELD POINT N/mm2 >=1,0%	Ns.Rif. OUR REF.
126,60	50,80	1	337,0	505,0	33,0	61,0	152,0 - 156,0	KV	20	84	82	80	0,0	

MATERIALE IN ACCORDO A / MATERIAL IN ACC. TO: ASTM/ASME A 105/SA 105 M - 09 CSA CAN3 Z-245.12-05 GRADE 248 CAT.I
TRATTAMENTO TERMICO / HEAT TREATMENT: NORMALIZED AT 920 C - COOLED IN STILL AIR
FORNO / FURNACE: ELECTRIC FURNACE
ORIGINE / ORIGIN: EUROPE

NOTE / NOTES:
MANUFACTURING IN ACCORDANCE WITH ORDER AND SPECIFICATION
MATERIAL IN ACCORDANCE WITH NACE MR-0175/2003 ISO 15156 - SOUR SERVICE
MATERIAL IN ACCORDANCE WITH NACE MR-0103/2007 - SOUR SERVICE

UFFICIO CONTROLLO QUALITA' / QUALITY CONTROL DEPARTEMENT
S. Corti

ENTE UFFICIALE DI COLLAUDO / INSPECTION AUTHORITY

MARCHIO PRODUZIONE / MANUFACTURER'S SYMBOL
MFF

PRIMTECH SERVICES CONFORMS TO: ASME
SEC. II, 20 ___ EDITION, 20 ___ ADDENDA
MAR 12 2012
By:
P.O. No.

41

P 1378 ERP 1001345

Purchaser : CCTE CORPORATION

INSPECTION CERTIFICATE

TO EN10204 3.1

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

E-No.	Purchase Order No.	Job No.	D M Y Certificate No.
MC-341	4600345		21/12/2011 T- 2011200867

No.		MFG. No.	Specification for Material Made from Seamless Pipe	Specification for Inspection	Visual Examination	Dimensional Inspection
			ASTM A234-11/ASME SA234-10 Gr.WPB CSA Z245.11-09 Gr.241 CAT 1 SS NACE MR0175/ISO 15156-2:09&MR0103-10	ASME B16.9-2007,B16.25-2007	Good	Good
			Product & Size (T:*1)	Quantity	Heat Treatment (Note 1)	Hardness Actual Data	Item No.
1		11M00005	90 EL WPB 3 S40	1,202/2,000	A	HB : 118 - 145	7510381
2		11M00021	90 EL WPB 4 S80	50/250	A	HB : 130 - 150	7510985
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.		%	HARDNESS MAX
Max.			10	29										240	415	30	197 HB : GOOD
Material Heat No.		30		106	50	58	40	40	40	15	60	20			655		
1	47400	16	22	87	13	2	3	2	9	3	3	1	34	340	489	31	
2	J1K2255	19	23	83	11	7	2	2	4	1	0	1	34	316	501	40	
3																	
4																	
5																	

CRIMTECH SERVICES LTD.
MATERIAL CONFORMS TO: ASME
SEC. II, 2010 EDITION, 20__ ADDENDA
MAR 12 2012
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° Cx0.5 HR. Air Cooling

The fittings was manufactured,sampled,tested,and inspected in accordance with the specification, and was found to meet the requirements.

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.

* 1 : "T" symbolized wall thickness in mm. * 2 : YS Yield strength TS = Tensile strength E = Elongation

Form TZ-6A/3

P1378 ERP 1003968

INSPECTION CERTIFICATE

RIGID INDUSTRIES CO., LTD

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

CRIMTECH SERVICES LTD.
MATERIAL CONFORMS TO: ASME
SEC. II, 2010 EDITION, 20__ ADDENDA
MAR 12 2012
By:
P.O. No.

PURCHASER : SEYBOLD
STANDARD : ASTM A234 WPB-07 / ASME SA234 WPB-04 / CSA Z245.11-05 Gr.241 Cat I Sour Service
MATERIALS : ASTM A106 Gr.B (SEAMLESS PIPE)
INSP. SPEC. : ASME B16.9 - 03

DATE: 2011 - 06 - 21
ORDER NO: 7004214/2769615OR210
P.I. NO: 1D06-2
CERTIFI. NO: 320

ACCORDING TO EN10204/DIN50049/3.1

ITEM NO.	PRODUCT & SIZE				QUANTITY PCS	MFG NO.	VISUAL & DIMENTIONAL INSPECTION	HARDNESS MAX. 197 HB	HEAT TREATMENT (NOTE)	MAGNETIC PARTICLE EXAMINATION	IMPACT TEST (J)
45	TEE	4"	1175849	160	9	9I248V	GOOD	141 - 152	N	GOOD	
46	TEE	6"	1171151	XH	25	1D1022	GOOD	151 - 164	N	GOOD	
47	TEE	10"	1174651	STD	20	0B3785	GOOD	150 - 154	N	GOOD	
48	ELL 45 LR	8"	1171877	XH	20	1C0992	GOOD	147 - 152	A		
49	ELL 90 LR	3"	1171629	XH	400	1A0312	GOOD	141 - 147	A		
50	ELL 90 LR	4"	1171143	XH	200	1D2859	GOOD	151 - 155	A		
51	CON-RED	6X3"	1174811	STD	30	1C2785	GOOD	144 - 153 ✓	N		
52	CON-RED	10X8"	1171653	STD	15	1A1354	GOOD	140 - 156	N		
53	RED-TEE	8X4"	1174491	STD	20	1C4851	GOOD	137 - 151	N	GOOD	
54	ELL 90 SR	3"	1171978	STD	50	0G2458	GOOD	132 - 135	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 KSI	T S KSI	E %	C.E. X100
	STANDARD	MIN.		10	29									35.0	60.0		
		MAX.	30		135	50	58	40	40	40	15	8	20		95.0		50
45	0826068V		10	26	108	6	2	8	3	7	2	1	<1	59.4	67.4	34.0	30
46	400822		18	22	98	7	4	4	3	6	6	<1	<1	49.9	70.3	31.2	37
47	0881285		21	27	62	10	4	10	4	5	2	1	1	39.9	73.3	37.0	33
48	906392		18	24	95	12	3	15	5	3	1	<1	<1	51.6	66.0	35.0	35
49	311312		19	25	55	6	1	7	3	3	2	<1	<1	54.3	60.7	32.0	29
50	312859		19	22	56	11	4	8	4	4	2	<1	<1	54.8	63.3	31.5	30
51	507785		17 ✓	26 ✓	98 ✓	8 ✓	7 ✓	4 ✓	2 ✓	5 ✓	5 ✓	<1 ✓	<1	44.4 ✓	66.9 ✓	30.5 ✓	35
52	205454		17	25	95	10	5	8	3	4	1	1	2	46.8	70.0	37.4	34
53	006251		18	21	94	11	7	7	3	3	2	1	3	45.4	69.0	34.2	35
54	305158		13	16	77	12	2	9	4	3	1	<1	<1	43.7	67.0	37.0	27

(NOTE): A: HOT FORMED WITH FINAL TEMPERATURE BETWEEN 620℃-980℃,AIR COOLING.
N: NORMALIZING AT TEMPERATURE 880℃X0.5HR,AIR COOLING.
NACE MR-01-75-03/ISO15156.2 & NACE MR 0103-03 : SATISFACTORY

WE HEREBY CERTIFY THAT THE PRODUCT DESCRIBED HEREIN HAS BEEN MANUFACTURED IN ACCORDANCE WITH THE SPECIFICATIONS CONCERNED AND ALSO WITH THE PURCHASER'S REQUIREMENTS AND THAT THE TEST RESULTS SHOWN HEREIN ARE CORRECT.

Ou C Lan

MANAGER OF Q.A. DEPT.

96

P13-3 ERP 1004135

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

MILL TEST CERTIFICATE

EN10204-3.1.B(DIN50049/3.1.B)
Customer: SEYBOLD INTERNATIONAL CORP.
Order No.: 7001500(1)-CEF

Certificate No.: SE1500A1
Date: 09/30/2009

PRODUCT	MATERIAL SPECIFICATIONS	DIMENSIONAL SPECIFICATIONS
FORGED CARBON STEEL FLANGES	ASTM A105-05/ASME SA105-07	ASME B16.5-03 CSA Z245.12

Item No.	CODE NO	DESCRIPTION	QUANTITY	CHEMICAL COMPOSITION (%) C	Si	Mn	P	S	Cu	Cr	Ni	Mo	V	Nb	N			CE(*3)
			Min	-	0.100	0.600	-	-	-	-	-	-	-	-	-			
			Max	0.350	0.350	1.050	0.035	0.040	0.400	0.300	0.400	0.120	0.080	0.020	-			
21	1073965	150 WNRF XS 1 1/2" A105N	21 PCE	0.190	0.200	1.140	0.008	0.011	0.110	0.080	0.070	0.005	0.003	0.005	0.009			0.409
22	1073965	150 WNRF XS 1 1/2" A105N	9 PCE	0.210	0.160	1.130	0.007	0.010	0.050	0.060	0.050	0.005	0.003	0.005	0.009			0.418
23	1074132	150 WNRF XS 2" A105N	650 PCE	0.212	0.260	1.030	0.016	0.009	0.007	0.021	0.054	0.002	0.010	0.005	0.003			0.392
24	1074132	150 WNRF XS 2" A105N	100 PCE	0.210	0.170	1.130	0.008	0.008	0.060	0.070	0.030	0.012	0.003	0.005	0.010			0.421
25	1070684	150 WNRF XS 2 1/2" A105N	5 PCE	0.190	0.170	1.130	0.017	0.015	0.090	0.100	0.060	0.005	0.003	0.005	0.009			0.409
26	1075039	300 WNRF STD 2" A105N	350 PCE	0.210	0.210	1.150	0.007	0.013	0.040	0.060	0.030	0.009	0.003	0.005	0.011			0.420
27	1075371	1500 WNRF S160 3" A105N	25 PCE	0.200	0.170	1.100	0.007	0.011	0.060	0.090	0.040	0.005	0.003	0.005	0.009			0.409
28	1073560	900 WNRTJ S160 3" A105N	5 PCE	0.200	0.230	1.120	0.007	0.011	0.050	0.070	0.030	0.005	0.003	0.005	0.008			0.407
29	1069798	150 BLRF 20" A105N	10 PCE	0.200	0.190	1.140	0.018	0.011	0.160	0.120	0.060	0.020	0.002	0.002	0.009			0.433
30	1070001	150 SORF 16" A105N	20 PCE	0.190	0.270	0.900	0.013	0.015	0.210	0.120	0.120	0.020	0.001	0.001	0.007			0.390

Item No.	Heat No.	T.S.(*1) (MPA)	Y.S.(*1) (MPA)	E.L.(*1) (%)	Hardness (HB)	R.A.(*1) (%)	Impact Test Temp: Minimum: Joule			Material Supplier
	Min	485.0	250.0	22.0	-	30.0	1	2	3	
	Max	-	-	-	187	-				
21	29570	491.3	298.1	35.4	150	65.9				OEMK
22	21530	519.8	335.4	36.0	154	66.8				OEMK
23	931275	509.9	323.6	34.2	155	66.0				NTMK
24	41331	527.6	375.6	34.0	154	65.9				OEMK
25	10828	501.1	302.0	35.0	150	68.6				OEMK
26	13145	521.7	317.7	34.4	153	67.7				OEMK
27	21532	515.8	331.5	34.2	155	66.8				OEMK
28	41367	535.4	348.1	33.8	154	65.9				OEMK
29	278362	525.6	361.9	33.6	152	70.4				SEAH BESTEEL
30	67140	499.2	297.1	35.0	150	66.0				RED OCTOBER

■ HEAT TREATMENT(*2)
☒ N

■ REMARKS
880°C X5HRS
CONFORMS WITH NACE MR0103-07 AND NACE MR0175/ISO15156.2
CONFORMS WITH Z245.12 CAT I GR.248 SOUR SERVICE-05

CRIMTECH SERVICES LTD.
MATERIAL CONFORMS TO: ASME
SEC. II, 20 10 EDITION, 20__ ADDENDA
MAR 12 2012
PO No.

*1: T.S. = Tensile Strength, Y.S.=Yield Strength, E.L.=Elongation, R.A.=Reduction of Area.

*2: N=Normalized, A=Annealed, Q=Quenched, T=Tempered, S.T=Solution Treated, S.R=Stress Relieved, A.C=Air Cooled, F.C=Furance Cooled, W.C=Water Cooled, O.C=Oil Cooled.

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

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

SAN ENG STEEL FORGING CO., LTD. S.E.M.C. QUALITY ASSURANCE DEP'T

Manager of Quality Assurance Dep't

P1378
ERP 1004797

1-4186

Purchaser : CCTF CORPORATION

INSPECTION CERTIFICATE

TO EN10204 3.1

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

E-No. MC-479 | Purchase Order No. 4500004 | Job No.

D M Y Certificate No.
21/12/2011 T- 2011200879

No.		MFG. No.	Specification for Material Made from Seamless Pipe ASTM A234-11/ASME SA234-10 Gr.WPB CSA Z245.11-09 Gr.241 CAT 1 SS NACE MR0175/ISO 10156-2:2005/MR0103-10	Specification for Inspection ASME B16.9-2007,B16.25-2007	Visual Examination Good	Dimensional Inspection Good
			Product & Size (T:*1)	Quantity	Heat Treatment (Note 1)	Hardness Actual Data	Item No.
1		11H20010	RC WPB 3 X 2 1/2 S40	15	N	HB : 120 - 140	7513151
2		11F20013	RC WPB 4 X 3 S40	20/400	N	HB : 135 - 150	7513330
3		11M20006	RC WPB 4 X 3 S40	276/400	N	HB : 135 - 150	7513330
4		11M20008	RC WPB 4 X 2 S40	25/40	N	HB : 125 - 140 ✓	7513372
5		11K20072	RC WPB 14 X 12 STD	7	N	HB : 130 - 145	7511337

Specification / Material Heat No.		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.		%	HARDNESS MAX
Max.			10	29										240	415	30	197 HB : GOOD
Material Heat No.		30		106	50	58	40	40	40	15	80	20			655		
1	J0K5087	19	26	86	14	6	1	2	6	8	0	0	36	354	518	38	
2	06426	18	20	79	11	3	3	3	6	1	0	0	33	302	470	36	
3	J1K2255	19	23	83	11	7	2	2	4	1	0	1	34	283	474	39	
4	J1K2255	19 ✓	23 ✓	83 ✓	11 ✓	7 ✓	2 ✓	2 ✓	4 ✓	1 ✓	0 ✓	1	34	283 ✓	474 ✓	39 ✓	
5	J1L6167	19	17	84	14	5	1	2	4	1	0	0	34	331	482	46	

(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

The fittings was manufactured,sampled,tested,and inspected in accordance with the specification,and was found to meet the requirements

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.

* 1 : "T" symbolized wall thickness in mm. * 2 : YS Yield strength TS = Tensile strength E = Elongation

Form TZ-6A/3

CRIMTECH SERVICES LTD.
MATERIAL CONFORMS TO ASME
SEC. II, 2010 ED. W ADDENDA
MAR 2 0 2012
By:
P.O. No.

Quality Assurance Manager
Thai Benkan Co., Ltd.

P 1378 ERP 1004135

METALFAR
PRODOTTI INDUSTRIALI S.P.A.

STAMPAGGIO A CALDO DI ACCIAI COMUNI - LEGATI E INOSSIDABILI

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

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

CERTIFICATO DI COLLAUDO SECONDO EN 10204 - 3.1 INSPECTION CERTIFICATE

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

Certif. N. 3853 Del/Dated 25.09.2010
Fattura / Invoice N. 2665 Del/Dated 23.09.2010
DDT / Del Note N. 4996 Del/Dated 23.09.2010
Ns.Ord. / Our ref. N. Del/Dated

SALA PROVE E ANALISI MATERIALI / MATERIAL TEST DEPARTMENT

COD. COL. COLATA / HEAT CODE HEAT: 10/30219 | POS. ITEM: 010 | VS.ORDINE / YOUR REFERENCE: 624/FR | Q.TA' / Q.TY: 224,00 | DESCRIZIONE / DESCRIPTION: W/N 150 RF 4" STD A105 | DIM.IN ACC. A / DIM. ACCORDANCE TO: ASME/ANSI B16.5 | VISIVO E DIMENS. / VIS. & DIMENS.: SATISFACTORY

MATERIALE / MATERIAL: ASTM A105

C%	Si%	Mn%	S%	P%	Cr%	Ni%	Mo%	Ti%	Cu%	V%	Nb%	N%	Al%	C.E.%	B %
0,185	0,190	1,110	0,010	0,011	0,070	0,040	0,010	0,018	0,120	0,003	0,003	0,000	0,025	0,397	0,000

PROVETTA / TEST SPECIMEN SEZ. mm2 / SECT. mm2	LUNG. mm / LENGHT mm	FORMA / SHAPE 1=O 2=□	SNERVAMENTO / YIELD POINT N/mm2 >=0,2%	ROTTURA / TENSILE STRENGHT N/mm2 >=	ALLUNGAMENTO / ELONGATION %>=	CONTRAZIONE / REDUCTION OF AREA %>=	DUREZZA / HARDNESS HB	RESILIENZA / IMPACT TEST - JOULE/cm2 TIPO / TYPE 10x10mm	°C	1	2	3	SNERVAMENTO / YIELD POINT N/mm2 >=1,0%	Ns.Rif. / OUR REF.
126,60	50,80	1	353,0	529,0	31,0	59,0	159,0 - 163,0	KV	20	90	90	86	0,0	

MATERIALE IN ACCORDO A / MATERIAL IN ACC. TO: ASTM/ASME A 105/SA 105 M - 09 CSA CAN3 Z-245.2-05 GRADE 248 CAT.I

TRATTAMENTO TERMICO / HEAT TREATMENT: NORMALIZED AT 920 C - COOLED IN STILL AIR

FORNO / FURNACE: ELECTRIC FURNACE

ORIGINE / ORIGIN: EUROPE

COD. COL. COLATA / HEAT CODE HEAT: 10/72782 | POS. ITEM: 016 | VS.ORDINE / YOUR REFERENCE: 624/FR | Q.TA' / Q.TY: 400,00 | DESCRIZIONE / DESCRIPTION: W/N 300 RF 2" STD A105 | DIM.IN ACC. A / DIM. ACCORDANCE TO: ASME/ANSI B16.5 | VISIVO E DIMENS. / VIS. & DIMENS.: SATISFACTORY

MATERIALE / MATERIAL: ASTM A105

C%	Si%	Mn%	S%	P%	Cr%	Ni%	Mo%	Ti%	Cu%	V%	Nb%	N%	Al%	C.E.%	B %
0,180	0,200	1,100	0,007	0,015	0,080	0,050	0,010	0,022	0,150	0,003	0,003	0,000	0,026	0,395	0,000

PROVETTA / TEST SPECIMEN SEZ. mm2 / SECT. mm2	LUNG. mm / LENGHT mm	FORMA / SHAPE 1=O 2=□	SNERVAMENTO / YIELD POINT N/mm2 >=0,2%	ROTTURA / TENSILE STRENGHT N/mm2 >=	ALLUNGAMENTO / ELONGATION %>=	CONTRAZIONE / REDUCTION OF AREA %>=	DUREZZA / HARDNESS HB	RESILIENZA / IMPACT TEST - JOULE/cm2 TIPO / TYPE 10x10mm	°C	1	2	3	SNERVAMENTO / YIELD POINT N/mm2 >=1,0%	Ns.Rif. / OUR REF.
126,60	50,80	1	338,0	546,0	33,0	58,0	164,0 - 166,0	KV	20	90	90	86	0,0	

MATERIALE IN ACCORDO A / MATERIAL IN ACC. TO: ASTM/ASME A 105/SA 105 M - 09 CSA CAN3 Z-245.2-05 GRADE 248 CAT.I

TRATTAMENTO TERMICO / HEAT TREATMENT: NORMALIZED AT 920 C - COOLED IN STILL AIR

FORNO / FURNACE: ELECTRIC FURNACE

ORIGINE / ORIGIN: EUROPE

COD. COL. COLATA / HEAT CODE HEAT: 10/30730 | POS. ITEM: 022 | VS.ORDINE / YOUR REFERENCE: 624/FR | Q.TA' / Q.TY: 44,00 | DESCRIZIONE / DESCRIPTION: W/N 600 RF 6" STD A105 | DIM.IN ACC. A / DIM. ACCORDANCE TO: ASME/ANSI B16.5 | VISIVO E DIMENS. / VIS. & DIMENS.: SATISFACTORY

MATERIALE / MATERIAL: ASTM A105

C%	Si%	Mn%	S%	P%	Cr%	Ni%	Mo%	Ti%	Cu%	V%	Nb%	N%	Al%	C.E.%	B %
0,200	0,230	1,120	0,008	0,009	0,090	0,050	0,010	0,017	0,150	0,000	0,000	0,000	0,025	0,420	0,000

PROVETTA / TEST SPECIMEN SEZ. mm2 / SECT. mm2	LUNG. mm / LENGHT mm	FORMA / SHAPE 1=O 2=□	SNERVAMENTO / YIELD POINT N/mm2 >=0,2%	ROTTURA / TENSILE STRENGHT N/mm2 >=	ALLUNGAMENTO / ELONGATION %>=	CONTRAZIONE / REDUCTION OF AREA %>=	DUREZZA / HARDNESS HB	RESILIENZA / IMPACT TEST - JOULE/cm2 TIPO / TYPE 10x10mm	°C	1	2	3	SNERVAMENTO / YIELD POINT N/mm2 >=1,0%	Ns.Rif. / OUR REF.
126,60	50,80	1	339,0	542,0	30,0	59,0	164,0 - 166,0	KV	20	90	87	89	0,0	

MATERIALE IN ACCORDO A / MATERIAL IN ACC. TO: ASTM/ASME A 105/SA 105 M - 09 CSA CAN3 Z-245.2-05 GRADE 248 CAT.I

TRATTAMENTO TERMICO / HEAT TREATMENT: NORMALIZED AT 920 C - COOLED IN STILL AIR

FORNO / FURNACE: ELECTRIC FURNACE

ORIGINE / ORIGIN: EUROPE

NOTE MANUFACTURING IN ACCORDANCE WITH ORDER AND SPECIFICATION
NOTES MATERIAL IN ACCORDANCE WITH NACE MR-0175/2003 ISO 15156 - SOUR SERVICE
MATERIAL IN ACCORDANCE WITH NACE MR-0103/2007 - SOUR SERVICE

CRIMTECH SERVICES LTD.
MATERIAL CONFORMS TO: ISO [illegible] EDITION, 20__ ADDENDA
MAR 12 2012
By:
P.O. No.

UFFICIO CONTROLLO QUALITA' / QUALITY CONTROL DEPARTEMENT: S. Corti

ENTE UFFICIALE DI COLLAUDO / INSPECTION AUTHORITY

MARCHIO PRODUZIONE / MANUFACTURER'S SYMBOL: MFF

P 1378 ERP 1006456

METALFAR
PRODOTTI INDUSTRIALI S.P.A.

STAMPAGGIO A CALDO DI ACCIAI COMUNI - LEGATI E INOSSIDABILI

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

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

SALA PROVE E ANALISI MATERIALI / MATERIAL TEST DEPARTMENT

CERTIFICATO DI COLLAUDO SECONDO EN 10204 - 3.1 INSPECTION CERTIFICATE

Certif. N. 450	Del/Dated 27.01.2012	Fattura / Invoice N. 256	Del/Dated 26.01.2012
DDT / Del Note N. 314	Del/Dated 26.01.2012	Ns.Ord. / Our ref. N.	Del/Dated

FORGED FLANGES & FITTINGS LTD
CASTLE HOUSE - STATION ROAD
EN5 1PE NEW BARNET/HERTFORD... GB

Dest.: F.F.F. c/o C.E. FRANKLIN LTD
EDMONTON, ALBERTA CA

COD. COL. HEAT CODE	COLATA HEAT	POS. ITEM	VS.ORDINE YOUR REFERENCE	Q.TA' Q.TY	DESCRIZIONE DESCRIPTION
	10/33382	100	3810/FR	390,00	W/N 600 RF 2" STD A105N

DIM.IN ACC. A
DIM. ACCORDANCE TO
ASME/ANSI B16.5 -2009

VISIVO E DIMENS.
VIS. & DIMENS.
SATISFACTORY

MATERIALE / MATERIAL
ASTM A105

C%	Si%	Mn%	S%	P%	Cr%	Ni%	Mo%	Ti%	Cu%	V%	Nb%	N%	Al%	C.E.%	B %
0,190	0,230	1,160	0,010	0,014	0,100	0,050	0,010	0,017	0,160	0,000	0,000	0,000	0,027	0,419	0,000

PROVETTA / TEST SPECIMEN SEZ. mm2 SECT. mm2	LUNG. mm LENGHT mm	FORMA SHAPE 1=○ 2=□	SNERVAMENTO YIELD POINT N/mm2 >=0,2%	ROTTURA TENSILE STRENGHT N/mm2 >=	ALLUNGAMENTO ELONGATION %>=	CONTRAZIONE REDUCTION OF AREA %>=	DUREZZA HARDNESS HBW	RESILIENZA / IMPACT TEST - JOULE/cm2 TIPO / TYPE 10x10mm	°C	1	2	3	SNERVAMENTO YIELD POINT N/mm2 >=1,0%	Ns.Rif. OUR REF.
126,60	50,80	1	346,0	538,0	30,0	60,0	163,0 - 165,0	KV	20	89	89	83	0,0	

MATERIALE IN ACCORDO A / MATERIAL IN ACC. TO
ASTM/ASME A 105/SA 105 M - 10 ASME CODE SECT. II, PART A, ED. 2010
CSA CAN3 Z-245.12-09 GRADE 248 CAT.I

TRATTAMENTO TERMICO / HEAT TREATMENT
NORMALIZED AT 920 C - COOLED IN STILL AIR

FORNO / FURNACE
ELECTRIC FURNACE

ORIGINE / ORIGIN
EUROPE

COD. COL. HEAT CODE	COLATA HEAT	POS. ITEM	VS.ORDINE YOUR REFERENCE	Q.TA' Q.TY	DESCRIZIONE DESCRIPTION
	11/38612	110	3810/FR	44,00	W/N 600 RF 6" XS A105N

DIM.IN ACC. A
DIM. ACCORDANCE TO
ASME/ANSI B16.5 -2009

VISIVO E DIMENS.
VIS. & DIMENS.
SATISFACTORY

MATERIALE / MATERIAL
ASTM A105

C%	Si%	Mn%	S%	P%	Cr%	Ni%	Mo%	Ti%	Cu%	V%	Nb%	N%	Al%	C.E.%	B %
0,195	0,240	1,160	0,008	0,011	0,090	0,040	0,010	0,017	0,130	0,002	0,001	0,000	0,028	0,420	0,000

PROVETTA / TEST SPECIMEN SEZ. mm2 SECT. mm2	LUNG. mm LENGHT mm	FORMA SHAPE 1=○ 2=□	SNERVAMENTO YIELD POINT N/mm2 >=0,2%	ROTTURA TENSILE STRENGHT N/mm2 >=	ALLUNGAMENTO ELONGATION %>=	CONTRAZIONE REDUCTION OF AREA %>=	DUREZZA HARDNESS HBW	RESILIENZA / IMPACT TEST - JOULE/cm2 TIPO / TYPE 10x10mm	°C	1	2	3	SNERVAMENTO YIELD POINT N/mm2 >=1,0%	Ns.Rif. OUR REF.
126,60	50,80	1	343,0	546,0	31,0	59,0	164,0 - 166,0	KV	20	86	86	83	0,0	

MATERIALE IN ACCORDO A / MATERIAL IN ACC. TO
ASTM/ASME A 105/SA 105 M - 10 ASME CODE SECT. II, PART A, ED. 2010
CSA CAN3 Z-245.12-09 GRADE 248 CAT.I

TRATTAMENTO TERMICO / HEAT TREATMENT
NORMALIZED AT 920 C - COOLED IN STILL AIR

FORNO / FURNACE
ELECTRIC FURNACE

ORIGINE / ORIGIN
EUROPE

CRIMTECH SERVICES LTD.
MATERIAL CONFORMS TO: ASME
SEC. II, 2010 EDITION, 20__ ADDENDA
MAR 14 2012
By: GH
P.O. No.

NOTE MANUFACTURING IN ACCORDANCE WITH ORDER AND SPECIFICATION
NOTES MATERIAL IN ACCORDANCE WITH NACE MR-0175/2003 ISO 15156-2009 - SOUR SERVICE
MATERIAL IN ACCORDANCE WITH NACE MR-0103/2010 - SOUR SERVICE

UFFICIO CONTROLLO QUALITA' QUALITY CONTROL DEPARTEMENT	ENTE UFFICIALE DI COLLAUDO INSPECTION AUTHORITY	MARCHIO PRODUZIONE MANUFACTURER'S SYMBOL
S. Corti		MFF

	FLOW LINK SYSTEMS (P) LTD FOUNDRY UNIT - II 65 / 2-A,B & C, PUDUPALAYAM B.P.O AVINASHI Tk, COIMBATORE - 641 654 INDIA.	**TEST CERTIFICATE** **(EN 10204-3.1)**	TC NO : **I-1399** DATE : **08.04.11**
CUSTOMER **ALBERTA STRAINERS LTD.,** **9577 - 60 AVENUE,** **EDMONTON, ALBERTA T6E OC2,** **CANADA.**		SPECIFICATION REFERENCE **1. ASTM A216-08 Gr.WCC** **2. NACE MR 0103 - 2010**	MELT NO. **2913H** FOUNDRY MARK **FLS**
PURCHASE ORDER NO. & DATE **V063 REV1 Dt - 08.10.10**		ORDER ACCEPTANCE NO. **10-1033-A1**	

CHEMICAL COMPOSITION %

SPECIFICATION	C	Si	S	P	Mn	Ni	Cr	Mo	V	Cu	Al	*RE
Minimum	--	--	--	--	--	--	--	--	--	--	--	--
Maximum	0.25	0.60	0.045	0.04	1.20	0.50	0.50	0.20	0.03	0.30	--	1.00
Achieved	0.213	0.36	0.014	0.025	0.93	0.08	0.04	0.005	0.004	0.03	--	0.16

HEAT TREATMENT: NORMALIZING: Temperature raised to 920°C, soaked for 3 hours and then air-cooled.

MECHANICAL PROPERTIES

SPECIFICATION	Y.S. (ksi)	UTS (ksi)	%ELONG. in 50mm (4d) / ~~in 50mm (5d)~~	% RED. IN AREA	NOTCH TOUGHNESS (at °C) J		BEND TEST		HARDNESS (HB)
					Values	Avg.	ANGLE	D	
Minimum	40	70	22	35	--	--	--	--	--
Maximum	--	95	--	--	--	--	--	--	237
Achieved	48.4	77.9	35.7	62.1	--	--	--	--	154

DETAIL OF CASTINGS

S.NO.	DESCRIPTION	DRAWING NO. / REV.	PART NO.	POURED QTY
1	2" 300 "Y" STRAINER BODY	01 08 04 1 011 / 1	--	10

REMARKS :

1. The above stated **ksi** values have been calculated based on original tested **N/MM²** values.
2. *** RE** = Ni + Cr + Mo +V +Cu

CERTIFIED THAT

1. THE ABOVE GIVEN DETAILS ARE CORRECT.
2. THE MATERIAL CONFORMS TO ABOVE SPECIFICATION.
3. THE MATERIAL IS FREE OF CONTAMINATION FROM RADIO ACTIVE ELEMENT OR RADIATION.

THE PARTS WERE MANUFACTURED,TESTED IN ACCORDANCE WITH THE ABOVE SPECIFICATION AND CERTIFIED IN ACCORDANCE WITH EN 10204 - 3.1

Prepared by:	Checked by:	
M.Ranjith		A.RAJENDRAN
M.RANJITH KUMAR	A.RAKKIYANNAN	ASSISTANT MANAGER -QUALITY MANUFACTURER'S AUTHORIZED INSPECTOR

	FLOW LINK SYSTEMS (P) LTD **FOUNDRY UNIT - II** 65 / 2-A,B & C, PUDUPALAYAM B.P.O AVINASHI Tk, COIMBATORE - 641 654 **INDIA.**	**TEST CERTIFICATE** **(EN 10204-3.1)**	TC NO : **I-1399** DATE : **08.04.11**
CUSTOMER **ALBERTA STRAINERS LTD.,** **9577 - 60 AVENUE,** **EDMONTON, ALBERTA T6E OC2,** **CANADA.**		SPECIFICATION REFERENCE **1. ASTM A216-08 Gr.WCC** **2. NACE MR 0103 - 2010**	MELT NO. **2913H** FOUNDRY MARK **FLS**
PURCHASE ORDER NO. & DATE **V063 REV1 Dt - 08.10.10**		ORDER ACCEPTANCE NO. **10-1033-A1**	

CHEMICAL COMPOSITION %

SPECIFICATION	C	Si	S	P	Mn	Ni	Cr	Mo	V	Cu	Al	*RE
Minimum	--	--	--	--	--	--	--	--	--	--	--	--
Maximum	0.25	0.60	0.045	0.04	1.20	0.50	0.50	0.20	0.03	0.30	--	1.00
Achieved	0.213	0.36	0.014	0.025	0.93	0.08	0.04	0.005	0.004	0.03	--	0.16

HEAT TREATMENT: NORMALIZING: Temperature raised to 920°C, soaked for 3 hours and then air-cooled.

MECHANICAL PROPERTIES

SPECIFICATION	Y.S. (ksi)	UTS (ksi)	%ELONG. in 50mm (4d) / ~~in 50mm (5d)~~	% RED. IN AREA	NOTCH TOUGHNESS (at °C) J		BEND TEST		HARDNESS (HB)
					Values	Avg.	ANGLE	D	
Minimum	40	70	22	35	--	--	--	--	--
Maximum	--	95	--	--	--	--	--	--	237
Achieved	48.4	77.9	35.7	62.1	--	--	--	--	154

DETAIL OF CASTINGS

S.NO.	DESCRIPTION	DRAWING NO. / REV.	PART NO.	POURED QTY
1	2" 300 "Y" STRAINER BODY	01 08 04 1 011 / 1	--	10

REMARKS :

1. The above stated **ksi** values have been calculated based on original tested **N/MM²** values.
2. *** RE** = Ni + Cr + Mo +V +Cu

CERTIFIED THAT

1. THE ABOVE GIVEN DETAILS ARE CORRECT.
2. THE MATERIAL CONFORMS TO ABOVE SPECIFICATION.
3. THE MATERIAL IS FREE OF CONTAMINATION FROM RADIO ACTIVE ELEMENT OR RADIATION.

THE PARTS WERE MANUFACTURED,TESTED IN ACCORDANCE WITH THE ABOVE SPECIFICATION AND CERTIFIED IN ACCORDANCE WITH EN 10204 - 3.1

Prepared by:	Checked by:	
M.RANJITH KUMAR	A.RAKKIYANNAN	A.RAJENDRAN ASSISTANT MANAGER -QUALITY MANUFACTURER'S AUTHORIZED INSPECTOR

	FLOW LINK SYSTEMS (P) LTD **FOUNDRY UNIT - II** 65 / 2-A,B & C, PUDUPALAYAM B.P.O AVINASHI Tk, COIMBATORE - 641 654 **INDIA.**	**TEST CERTIFICATE** **(EN 10204-3.1)**	TC NO : **I-1225** DATE : **21.03.11**
CUSTOMER **ALBERTA STRAINERS LTD.,** **9577 - 60 AVENUE,** **EDMONTON, ALBERTA T6E OC2,** **CANADA.**		SPECIFICATION REFERENCE **1. ASTM A216-08 Gr.WCC** **2. NACE MR 0103 - 2010**	MELT NO. **2927H** FOUNDRY MARK **FLS**
PURCHASE ORDER NO. & DATE **V063 REV1 Dt - 08.10.10 & V060 Dt - 24.06.10**		ORDER ACCEPTANCE NO. **10-1033 & 10-646-A1**	

CHEMICAL COMPOSITION %

SPECIFICATION	C	Si	S	P	Mn	Ni	Cr	Mo	V	Cu	Al	*RE
Minimum	--	--	--	--	--	--	--	--	--	--	--	--
Maximum	0.25	0.60	0.045	0.04	1.20	0.50	0.50	0.20	0.03	0.30	--	1.00
Achieved	0.210	0.39	0.015	0.025	0.95	0.05	0.04	0.005	0.003	0.13	--	0.23

HEAT TREATMENT: NORMALIZING: Temperature raised to 920°C, soaked for 3 hours and then air-cooled.

MECHANICAL PROPERTIES

SPECIFICATION	Y.S. (ksi)	UTS (ksi)	%ELONG. in 50mm (4d) / ~~in 50mm (5d)~~	% RED. IN AREA	NOTCH TOUGHNESS (at °C) J		BEND TEST		HARDNESS (HB)
					Values	Avg.	ANGLE	D	
Minimum	40	70	22	35	--	--	--	--	--
Maximum	--	95	--	--	--	--	--	--	237
Achieved	46.2	80.6	35.7	63.7	--	--	--	--	159

DETAIL OF CASTINGS

S.NO.	DESCRIPTION	DRAWING NO. / REV.	PART NO.	POURED QTY
1	2" 300 "Y" STRAINER BODY	01 08 04 1 011 / 1	--	10

REMARKS :

1. The above stated ksi values have been calculated based on original tested N/MM² values.
2. * **RE** = Ni + Cr + Mo +V +Cu

CERTIFIED THAT

1. THE ABOVE GIVEN DETAILS ARE CORRECT.
2. THE MATERIAL CONFORMS TO ABOVE SPECIFICATION.
3. THE MATERIAL IS FREE OF CONTAMINATION FROM RADIO ACTIVE ELEMENT OR RADIATION.

THE PARTS WERE MANUFACTURED,TESTED IN ACCORDANCE WITH THE ABOVE SPECIFICATION AND CERTIFIED IN ACCORDANCE WITH EN 10204 - 3.1

Prepared by:	Checked by:	
M.Ranjith		A.RAJENDRAN
M.RANJITH KUMAR	A.RAKKIYANNAN	ASSISTANT MANAGER -QUALITY MANUFACTURER'S AUTHORIZED INSPECTOR

	FLOW LINK SYSTEMS (P) LTD AVANASHI ROAD, ARASUR, COIMBATORE-641 407. INDIA	**TEST CERTIFICATE** (EN 10204-3.1)	TC NO : 151A DATE : 24/4/2012

CUSTOMER ALBERTA STRAINERS LTD., 9577 - 60 AVENUE, EDMONTON, ALBERTA T6E OC2, CANADA.	SPECIFICATION REFERENCE 1. ASTM A216-08 Gr.WCC 2. NACE MR 0175	MELT NO 4143 FOUNDRY MARK FLS

PURCHASE ORDER NO & DATE	ORDER ACCEPTANCE NO & DATE
V070/dt.07.04.11 & V076/dt.09.09.11	11-0394 & 11-0966

CHEMICAL COMPOSITION %

SPECIFICATION	C	Si	S	P	Mn	Ni	Cr	Mo	V	Cu	AL	*RE
Minimum	--	--	--	--	--	--	--	--	--	--	--	--
Maximum	0.25	0.60	0.045	0.040	1.20	0.50	0.50	0.200	0.030	0.30	--	1.00
Achieved	0.20	0.37	0.014	0.020	1.03	0.05	0.07	0.004	0.004	0.03	--	0.15

HEAT TREATMENT NORMALISING: Temperature raised to 920°C, Soaked for 2 hours and then atmospheric air-cooled.

MECHANICAL PROPERTIES

SPECIFICATION	Y.S. (KSI)	UTS (KSI)	%ELONG. IN 50MM4(d)/ ~~IN 50MM(5d)~~	% RED IN AREA	NOTCH TOUGHNESS (at - ° C) J		BEND TEST		HARDNESS
					Values	Avg.	ANGLE	D	(BHN)
Minimum	40	70	22	35	--	--	--	--	--
Maximum	--	95	--	--	--	--	--	--	237
Achieved	41.59	73.02	37.62	63.22	--	--	--	--	170

DETAIL OF CASTINGS

SNO.	DESCRIPTION	DRAWING NO / REV.	PART NO	POURED QTY
1	2"300 STRAINER BODY	01 08 04 1 011-01	-------	8
2	2"600 STRAINER CAP	01 08 06 5 012-03	-------	12

REMARKS:
1. The above stated KSI values have been calculated based on original tested N/MM² values
2. RE*=Ni + Cr +Mo+ V + Cu

CERTIFIED THAT
1. THE ABOVE GIVEN DETAILS ARE CORRECT.
2. THE MATERIAL CONFORMS TO ABOVE SPECIFICATION.
3. We also certify that the Material is free of contamination from Radio active element or Radiation.
THE PARTS WERE MANUFACTURED,TESTED IN ACCORDANCE WITH THE ABOVE SPECIFICATION AND CERTIFIED IN ACCORDANCE WITH EN 10204 3.1

K. THIRUMURTHY
Engineer-quality assurance

MANUFACTURER'S AUTHORIZED INSPECTOR

Prepared by:	Checked by:
VK	QAE

	FLOW LINK SYSTEMS (P) LTD **FOUNDRY UNIT - II** 65 / 2-A,B & C, PUDUPALAYAM B.P.O AVINASHI Tk, COIMBATORE - 641 654 **INDIA.**	**TEST CERTIFICATE** **(EN 10204-3.1)**	TC NO : **I-1221** DATE : **21.03.11**
CUSTOMER **ALBERTA STRAINERS LTD.,** **9577 - 60 AVENUE,** **EDMONTON, ALBERTA T6E OC2,** **CANADA.**		SPECIFICATION REFERENCE **1. ASTM A216-08 Gr.WCC** **2. NACE MR 0103 - 2010**	MELT NO. **2908H** FOUNDRY MARK **FLS**
PURCHASE ORDER NO. & DATE **V063 REV1 Dt - 08.10.10 & V060 Dt - 24.06.10**		ORDER ACCEPTANCE NO. **10-1033 & 10-646-A1**	

CHEMICAL COMPOSITION %

SPECIFICATION	C	Si	S	P	Mn	Ni	Cr	Mo	V	Cu	Al	*RE
Minimum	--	--	--	--	--	--	--	--	--	--	--	--
Maximum	0.25	0.60	0.045	0.04	1.20	0.50	0.50	0.20	0.03	0.30	--	1.00
Achieved	0.210	0.39	0.013	0.022	0.93	0.06	0.04	0.005	0.004	0.02	--	0.13

HEAT TREATMENT: NORMALIZING: Temperature raised to 920°C, soaked for 3 hours and then air-cooled.

MECHANICAL PROPERTIES

SPECIFICATION	Y.S. (ksi)	UTS (ksi)	%ELONG. in 50mm (4d) / ~~in 50mm (5d)~~	% RED. IN AREA	NOTCH TOUGHNESS (at °C) J		BEND TEST		HARDNESS (HB)
					Values	Avg.	ANGLE	D	
Minimum	40	70	22	35	--	--	--	--	--
Maximum	--	95	--	--	--	--	--	--	237
Achieved	46.0	72.2	35.7	62.5	--	--	--	--	143

DETAIL OF CASTINGS

S.NO.	DESCRIPTION	DRAWING NO. / REV.	PART NO.	POURED QTY
1	2" 300 "Y" STRAINER BODY	01 08 04 1 011 / 1	--	20

REMARKS :

1. The above stated **ksi** values have been calculated based on original tested **N/MM²** values.
2. * **RE** = Ni + Cr + Mo +V +Cu

CERTIFIED THAT

1. THE ABOVE GIVEN DETAILS ARE CORRECT.
2. THE MATERIAL CONFORMS TO ABOVE SPECIFICATION.
3. THE MATERIAL IS FREE OF CONTAMINATION FROM RADIO ACTIVE ELEMENT OR RADIATION.

THE PARTS WERE MANUFACTURED,TESTED IN ACCORDANCE WITH THE ABOVE SPECIFICATION AND CERTIFIED IN ACCORDANCE WITH EN 10204 - 3.1

Prepared by:	Checked by:	
M.RANJITH KUMAR	A.RAKKIYANNAN	A.RAJENDRAN ASSISTANT MANAGER -QUALITY MANUFACTURER'S AUTHORIZED INSPECTOR

x48x96

HEAT # U1106589

Lifting Lugs

1014884

P1378/1432

PT. GUNAWAN DIANJAYA STEEL Tbk.

Surabaya - Indonesia

Head Office :
Jl. Margomulyo No. 29 A
Greges - Asemtowo - Surabaya 60183
Phone : (62-31) 7450598 (Hunting)
Fax : (62-31) 7490581
E-mail : quality@gunawansteel.com
http://www.gunawansteel.com

ISO 9001 : 2008
Cert. No. JA1 0945177

MILL TEST CERTIFICATE

ACC. TO EN10204 : 2004 3.1

Customer :

Order No. : E - 231 - 2011 ORDER NO. 9004-V
S. Contract no : 134/GDS/2011
Material : PRIME NEWLY PRODUCED HOT ROLLED STEEL PLATES
Specification : CSA G40.21 GRADE 44W
Tolerances : ASTM A6

Certificate No. : GDS/QC/11/231
Date : November 7, 2011
SHIPPING MARKS : PT. GDS Tbk./SIZE/HEAT NO./PLATE NO./
QUALITY/MADE IN INDONESIA/VANCOUVER, AND 9004-V
COLOUR MARKING : BROWN

Heat Number	Plate Number	Quantity	Dimensions (mm) T (INCH)	W (INCH)	L (INCH)	Weight (MT)	Ladle Analysis (%) C x 10⁻²	Si	Mn	P x 10⁻³	S	Nb x 10⁻³	Cu	Cr	Ni x 10⁻³	Mo	V	Al	Ti x 10⁻³	N	Tensile Test Test No.	Y.S KSI N/mm²	T.S KSI N/mm²	El % 200mm 5.65√So	Bend Test	Impact Value in Joule (°C) I	II	III	Av	Reference
U 1106580	M 42-43	2	3/4	48	96	0.890	20	20	97	9	8	<10	3	3	2	<10	<5	44	<5	6	V3	47	71	25						
	O 311-315	5	"	"	"	2.225																								
	O 321-325	5	"	"	"	2.225																								
U 1106602	H 42-43	2	"	"	"	0.890	20	21	98	13	10	<10	5	3	3	<10	<5	35	<5	9	I4	48	73	26						
	I 42	1	"	"	"	0.445																								
U 1107671	T 43	1	"	"	"	0.445	17	28	106	12	3	<10	3	3	3	<10	<5	43	<5	8	T4	49	71	28						
U 1109255	J 33-34	2	"	"	"	0.890	21	21	96	11	10	<10	6	2	3	<10	<5	30	<5	7	J3	50	75	26						
	J 311-316	6	"	"	"	2.670																								
	L 41-410	10	"	"	"	4.450																								
U 1109257	I 311-315	5	"	"	"	2.225	20	25	97	10	4	<10	5	3	3	<10	<5	35	<5	6	H4	48	75	23						
	I 33-34	2	"	"	"	0.890																								
	K 33-34	2	"	"	"	0.890																								
U 1109262	H 42	1	"	"	"	0.445	21	24	100	11	6	<10	4	2	3	<10	<5	45	<5	7	H4	49	75	25						
	M 42	1	"	"	"	0.445																								
U 1109266	O 41-49	9	"	"	"	4.005	20	22	101	14	5	<10	6	2	3	<10	<5	41	<5	7	I4	49	75	25						
	Q 41-410	10	"	"	"	4.450																								
U 1109267	I 31-314	14	"	"	"	6.230	20	25	98	12	8	<10	4	2	3	<10	<5	35	<5	8	R4	51	76	24						
	U 13	1	"	"	"	0.445																								
	U 23	1	"	"	"	0.445																								
	U 33	1	"	"	"	0.445																								
	U 43	1	"	"	"	0.445																								
U 2106434	F 42-43	2	"	"	"	0.890	21	28	93	15	4	<10	3	3	2	<10	<5	35	<5	10	G3	53	77	25						
	R 42-43	2	"	"	"	0.890																								

WE HEREBY CERTIFY THAT THE MATERIAL HEREIN HAS BEEN MADE AND TESTED IN ACCORDANCE WITH THE ABOVE SPECIFICATION AND ALSO WITH THE REQUIREMENT CALLED FOR BY THE ABOVE ORDER

PT. GUNAWAN DIANJAYA STEEL

QA/QC Manager