6120-C-265-001 MPEI

QUALITY CONTROL REPORT

AGNICO EAGLE

Vendor Document Status

1 ☐ Proceed to next submission and status.

2 ☐ Proceed with exceptions as noted to next submission and status.

3 ☐ Do not proceed.
Revise as noted and resubmit next submission and status.

4 ☑ Complete, no further submission required.

By: Bruno Roy

Digitally signed by Bruno Roy
Date: 2019.12.13 11:20:39 -05'00'

Date:

Review and authorization to fabricate are only for general conformance with the design concept of the Project as expressed in the Contract Documents. Sole responsibility for the accuracy and completeness of this document, including but not limited to dimensions and quantities, remains with the Supplier/Contractor. Agnico Eagle does not warrant the accuracy or completeness of any of the information contained herein, nor does Agnico Eagle authorize or approve any construction means, methods, techniques, sequences or any safety precautions or procedures.

Agnico Eagle No. 6120-C-265-001 R: ABF.QC.REPORT

DOCUMENT FOR INFORMATION

1

Préparé par:
CONSULTANTS EN SOUDAGE MEQUALTECH Pour :
18C-088

DESCRIPTION DE LA MÉTHODE DE SOUDAGE (DMS)
WELDING PROCEDURE SPECIFICATION (WPS)

(Référence ASME Sections VIII & IX. ed. 2017 & ASME B31.3 ed. 2016)

NOTE: Les titres désignent les hommes et les femmes / Titles refer to men and women

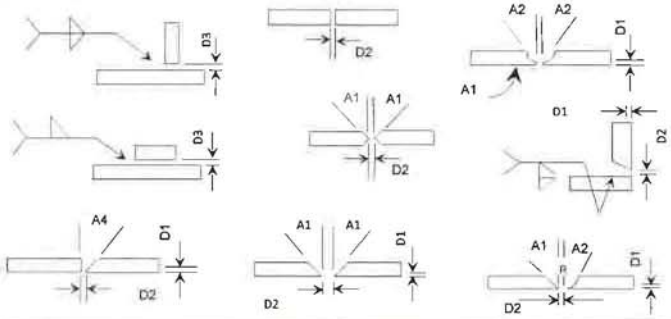
	Désignation de la Méthode *Provincial registration*		Enregistrement provincial *Provincial registration*
ABF CONSTRUCTION 138, Chemin des Boisés Val-d'Or,secteur Dubuisson, Qc, J9P 4N7 Canada	DMS / *WPS*	**SMAW-P1-P1** Révision: 0	MTL 310.6
	RMS / *PQR*	**SMAW-P1-P1-A**	

Procédé(s) de soudage / *Welding process*

	Manuel *Manual*		Semi-automatique *Semi-automatic*	Machine-auto *Auto.machine*
SMAW		X		

Joints / *Joints* (QW-402)

Genre / *Design*	**Carré, chanfreiné, angle** ***Square, groove, fillet***	
Soutien / *Backing*	Oui / *Yes*	X
	Non / *No*	X
Matériau de soutien *Backing material*	Option	**Soudure ou P1** ***Weld or P1***
Support de retenue *Retainer*	**Aucun / *None***	
Autre / *Other*	**Aucun / *None***	



A1=30½°±2½° (VAISSEAU / *VESSEL*)
A1=37½°±2½° (TUYAUTERIE / *PIPING*)
A2=20½°±2½° **A3**=10½°±2½° **A4**=45°±5½°
D1=1/16" ± 1/16"
D2=1/16" ± 1/16"
(SANS BARRE DE SOUTIEN / *WITHOUT BACKING*)
D2=3/16" ± 1/8"
(AVEC BARRE DE SOUTIEN / *WITH BACKING*)
D3= 0" + 5/32"

Métaux de base / *Base metal* (QW-403)

Métaux de base P. No. / *Base metal: P.No.*	**P1** (Gr: 1 ou / or 2) à/*to* **P1** (Gr. 1 ou / or 2)
Gamme d'épaisseurs qualifiées pour le métal de base *Base metal thickness range qualified*	Chanfrein / *Groove* : **0.1685" à/*to* 0.587" maximum** (Voir / See note 4) Angle / *Fillet* : **Aucune limite / *No limit***
Épaisseur maximale de la plus épaisse des passes de soudage *Maximun thickness of any welding pass*	**0.250" maximum**
Autre / *Others*	**Aucun / *None***

Métaux d'apport / *Filler metals* (QW-404)

1 AWS N° / No	**E-6010**	SF A: **5.1**	F-No. **3**	A-No. **1**	**Dia:** 3/32"-1/8"-5/32"
	E-7018-1	SF A: **5.1**	F-No. **4**	A-No. **1**	**Dia:** 3/32"-1/8"-5/32"-3/16"-1/4"
Gamme des épaisseurs qualifiées pour le dépôt de soudage *Weld metal thickness range qualified*	Chanfrein / *Groove* **(F3: 0.250" max.) (F4: 0.424" max.)** Angle / *Fillet* : **Aucune limite / *No limit***				
Pièce insérée consumable / *Consumable insert*	**Aucun / *None***				
Poudre ou fil supplémentaire / *Supplementary powder or wire*	**Aucun / *None***				

Position / *Positions* (QW-405)

Position(s) du chanfrein / *Position of groove*	**Toutes positions / *All positions***
Progression du soudage / *Welding progression*	**Montant, descendant / *Up, down***
Position(s) de l'angle / *Position(s) of fillet*	**Toutes positions / *All positions***

Préchauffage / *Preheat (QW-406)*

Température de préchauffage, maintien du préchauffage (Optionel) *Preheat temperature, preheat temperature (Optional).*	**T ≤ 1½ in.: 50° F Min.**	**2½ in. < T ≤ 4 in.: 250° F Min.**
	1½ in. < T ≤ 2½ in.: 150° F Min.	**T > 4 in.: 300° F Min.**
Température de l'interpasse / *Enterpass temperature*	50° F Min.	
Autre / *Other*	**Aucun / *None***	

Traitement thermique postchauffage / *Posteweld heat treatment* (QW-407)

Gamme de températures / *Temperature range*	**Aucun / *None***
Gamme de durée / *Time range*	**Aucun / *None***
Note / *Note*	**Aucun / *None***

Gaz / *Gas* (QW-408)

Composition du gas de protection / *Shielding gas composition*	**Aucun / *None***
Débit du gaz / *Gas flow rate*	**Aucun / *None***
Composition du gaz de soutien / *Backing gas composition*	**Aucun / *None***
Gaz de protection trainant / *Training sheilding gas composition*	**Aucun / *None***

Caractéristiques électrique et technique / *Electrical, technical characteristics* (QW-409-QW-410)

Métal d'apport / *Filler metal*				Courant / *Current*			
Procédé *Process*	Diamètre *Diameter*	Classification *Classification*	Position de soudage *Weld position*	Type, polarité *Type, polarity*	Gamme d'ampérage *Amperage range*	Gamme de voltage *Voltage range*	Gamme de vitesse *Travel speede range*
SMAW	3/32"	E-6010	Toutes / *All*	CC-*DC / EP-RP*	50-85	20-30	Variable / *Variable*
SMAW	1/8"	E-6010	Toutes / *All*	CC-*DC / EP-RP*	60-120	22-32	Variable / *Variable*
SMAW	5/32"	E-6010	Toutes / *All*	CC-*DC / EP-RP*	80-150	24-34	Variable / *Variable*
SMAW	3/32"	E-7018-1	Toutes / *All*	CC-*DC / EP-RP*	75-115	20-28	Variable / *Variable*
SMAW	1/8"	E-7018-1	Toutes / *All*	CC-*DC / EP-RP*	90-160	20-28	Variable / *Variable*
SMAW	5/32"	E-7018-1	Toutes / *All*	CC-*DC / EP-RP*	130-220	20-28	Variable / *Variable*
SMAW	3/16"	E-7018-1	Toutes / *All*	CC-*DC / EP-RP*	160-315	24-32	Variable / *Variable*
SMAW	1/4"	E-7018-1	Toutes / *All*	CC-*DC / EP-RP*	280-380	24-32	Variable / *Variable*

Courant pulsé / *Pulse current*	N/A
Grosseur et type d'électrode de tungstène *Tungsten electrode size and type*	N/A
Mode de transfert du métal / *Mode of metal transfer* GMAW / FCAW / MCAW	N/A
Cordon droit ou oscillant String or weave bead	Droit ou oscillant / *String or wave, Largeur / Whidth: 3 x dia. Electrode*
Procédé de gougeage arrière Method of back gouging	Meulage, scie,outil d'allésage / *Grinding, saw, bit tool*
Nettoyage initial et entre les passes / *Initial and interpass cleaning*	Les surfaces à souder doivent être libres de graisse, d'huile, de peinture ou de matière pouvant nuire à la qualité de la soudure; brossage, meulage, ciseau pneumatique / *All surfaces within one (1) inch from the welding joint and all edges shall be free from all traces of lubrifiants, cutting oils and foreign matter; brushimg, grinding, chipping.*
Diamètre de la tuyière à gaz / *Orifice or gas cup size*	N/A
Oscillation / *Oscillation*	Fréquence / *Frequency* : N/A
Distance entre tuyière et pièce / *Contact tube to work distance*	N/A
Passe unique ou multiple (par côté) / *Multiple or single pass (per side)*	Unique ou multiple / *Single or multiple pass*
Électrode unique ou multiple / *Multiple or single electrode*	Unique / *Single*
Gamme de vitesse d'alimentation de l'électrode / Electrode wire feed speed range	N/A
Autre / *Other*	Aucun martelage permis / *Peening is not permitted*

Autres commentaires / *Supplementary Comments*

1) Essais de pliage guidés / *Guided bend tests*	Voir rapport / *See report* 18C-088 1/3
2) Essais de traction / *Tensile tests*	Voir rapport / *See report* 18C-088 2/3
3) Essais de dureté / *Hardness test*	Non requis / *Not required*
4) Essais de résilience / *Impact test*	Lorsque les essais d'impact ne sont pas requis, les matériaux de base de tout groupe peuvent être soudés et la gamme d'épaisseur qualifiée est de 0.1685" à 0.587" selaon ASME B31.3, table 323.3.1. / *When impact test is not required, base material of all group may be welded and thickness range qualified is 0.1685" to 0.587" according to ASME B31.3 table 323.3.1*
5) Analyse chimique / *Chimical analysis*	Non requis / *Not required*
6) Ferriscomètre / *Ferriscometer*	Non requis / *Not required*
7) Macrographie / *Macro-examination*	Non requis / *Not required*
8) Métallographie / *Metallography*	Non requis / *Not required*
9) Traitement thermique / *Heat treatment*	Non requis / *Not required*
10) Énergie de chaleur (J/in) / *Heat inmput (J/in)*	E-6011 : 22390 (J/in) max. / E-7018-1 : 28641 (J/in) max.
11) Critères d'acceptation / *Acceptance criteria*	ASME sect. VIII Div. 1 UG-84 B31.3 Art.323.3

Signature du représentant de l'entreprise / *Company representative signature*

18C-088

Réservé au autorités / *Departement use only*

Vérifié par : I. CRITHAM (Y)

Date: 03 AVR. 2018

QC RÉGIE DU BÂTIMENT
MTL310.6
ENREGISTRÉ
SELON LA LOI SUR LES APPAREILS SOUS PRESSION 2001
VÉRIFIÉ PAR I.C. (Y)
DATE 03 AVR. 2018

Préparé par:
CONSULTANTS EN SOUDAGE MEQUALTECH Pour :
18C-088

RÉSULTAT DE LA MÉTHODE DE SOUDAGE (RMS)
PROCEDURE QUALIFICATION RESULT (PQR)

(Référence ASME Sections VIII & IX. ed. 2017 & ASME B31.3 ed. 2016)

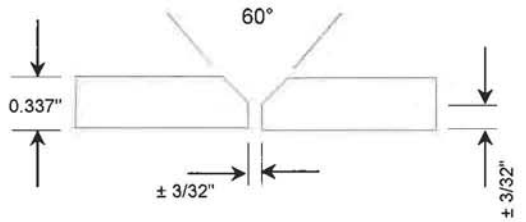
NOTE: Les titres désignent les hommes et les femmes / Titles refer to men and women

	Désignation de la Méthode *Procedure identification*		Enregistrement provincial *Provincial registration*
ABF CONSTRUCTION 138, Chemin des Boisés Val-d'Or,secteur Dubuisson, Qc, J9P 4N7 Canada	*RMS PQR*	**SMAW-P1-P1-A**	MTL-310.6
	DMS *WPS*	**SMAW-P1-P1 Rev.0**	

Procédé(s) de soudage / *Welding process*				
SMAW	Manuel *Manual*	X	Semi-auto. *Semi-auto.*	Machine-auto *Auto.machine*

Métaux de base / *Base metals* (QW-403)	
SA-333 Gr. 6 à / *to* SA-350 LF2	
Épaisseur / *Thickness*	**0.337"**
Épaisseur de la couche la plus épaisse *Thickness of the thicker pass*	**0.125"**
Autre / *Other*	**Aucun / None**

Joint / *Joint* (QW-402)



Métaux d'apport / *Filler metals* (QW-404)				
Classe / *Class* AWS	SFA. No.	F-No	A-No	Épaisseur du dépot *Weld thickness*
E 6011	**5.1**	**3**	**1**	**0.125"**
E 7018	**5.1**	**4**	**1**	**0.212"**

Positions / *Positions* (QW-405)	
Position du chanfrein *Position of groove*	**6 G**
Progression de soudage *Welding progression*	**Verticale montante / *Vertical up***
Autre / *Other*	**Aucun / *None***

Préchauffage / *Preheat* (QW-406)	
Température de préchauffage *Preheat temperature*	**50° F**
Température de l'interpasse *Interpass temperature*	**50° F min.**
Autre / *Other*	**Aucun / *None***

Traitement postchauffage/ *Postweld heat treatment* (QW-407)	
Gamme de température *Temperature range*	**Aucun / *None***
Gamme de durée / *Time range*	.....
Autre / *Other*	**Aucun / *None***

Gaz / *Gas* (QW-408)	
Composition du gaz de protection *Shielding gas composition*	**Aucun / *None***
Débit de gaz / *Gas flow rate*	.....
Composition gaz soutien *Backing gas composition*	**Aucun / *None***
Débit de gaz / *Gas flow rate*	.....
Autre / *Other*	**Aucun / *None***

Technique / *Technique* (QW-410)	
Cordon droit ou oscillant *String or weave bead*	**Droit / *String***
Oscillation / Osciillation	**N/A**
Passe unique ou multiple (par côté) *Multiple or single pass (per side)*	**Côté A Multiple / *Multiple***
Électrode unique ou multiple *Multiple or single electrode*	**Unique / *Single***
Autre / *Other*	**Aucun / *None***

Caractéristiques électrique et techniques / *Electrical and technical characteristics* (QW-409-410)

Couche *Layer*	Procédé *Process*	Classification *Classification*	Diamètre *Diameter*	Type *Type*	Polarité *Polarity*	Ampérage *Amperage*	Voltage *Volt range*	Gamme de vitesse *Travel speed range*	Débit de chaleur *Heat input*
1A	SMAW	E-6011	1/8"	CC/*DC*	EP/*RP*	**85**	**27**	**6,15 in/min.**	**22390 (J/in.)**
2A	SMAW	E-7018-1	1/8"	CC/*DC*	EP/*RP*	**110**	**23**	**5,3 in/min.**	**28641 (J/in.)**
3A	SMAW	E-7018-1	1/8"	CC/*DC*	EP/*RP*	**110**	**23**	**5,3 in/min.**	**28641 (J/in.)**
4A	SMAW	E-7018-2	1/8"	CC/*DC*	EP/*RP*	**110**	**22**	**5,4 in/min.**	**26888 (J/in.)**
5A	SMAW	E-7018-1	1/8"	CC/*DC*	EP/*RP*	**110**	**22**	**5,4 in/min.**	**26888 (J/in.)**

Essais à la traction / *Tensile test* (QW-150)

Éprouvette *Specimen*	Largeur *Width*	Épaisseur *Thickness*	Surface *Area*	Charge ultime *Ultimate total load*	Limite de contrainte *Ultimate unit stress*	Nature, endroit de rupture *Character, location of failure*
1	0,756 in.	0,328 in.	0,2480 in^2	19375 lbs	78135 PSI / 539 Mpa	Base material / Ductile
4	0,758 in.	0,335 in.	0,2539 in^2	19475 lbs	76694 PSI / 529 Mpa	Base material / Ductile

Essais de pliage guidé / *Guide bend test* (QW-160)

Éprouvette / *Specimen*	Face / *Face*	Racine / *Root*	Côté / *Side*	Résultat / *Result*
2	x			Accepté / Accepted
3		x		Accepté / Accepted
5	x			Accepté / Accepted
6		x		Accepté / Accepted

Essais de résilience / *Toughness test* (QW-170)

Éprouvette Specimen	Endroit de l'entaille *Notch location*	Forme de l'entaille *Notch type*	Température d'éprouvette *Specimen temperature*	Energie de rupture *Impact value*	Expansion latérale *Lateral expension*		Essai chute libre *Drop weigth*	
					% cisaillement *Shear*	Millième *Mills*	Cassé *Break*	Non cassé *No break*
1	Soudure / Weld	v	- 45°C	95 J	60	81	√	
2	Soudure / Weld	v	- 45°C	36 J	40	32	√	
3	Soudure / Weld	v	- 45°C	89 J	60	71	√	
1	ZAT / HAZ SA-333	v	- 45°C	87 J	70	74	√	
2	ZAT / HAZ SA-333	v	- 45°C	89 J	60	75	√	
3	ZAT / HAZ SA-333	v	- 45°C	49 J	50	43	√	
1	ZAT / HAZ SA-350	v	- 45°C	124 J	85	77	√	
2	ZAT / HAZ SA-350	v	- 45°C	119 J	85	80	√	
3	ZAT / HAZ SA-350	v	- 45°C	153 J	100	84	√	

Analyse chimique / *Chimical analysis*

C	Si	Mn	Ni	Cr	Nb	P	S	Fe	Cu	Mo	Ti	V	AL	B	Co	W	Be	Pb

Non requis / *Not required*

Essais de dureté / *Hardness test*

Non requis / *Not required*

Essais effectués par / GROUPE MEQUALTECH / *Test conducted by*

LABORATOIRE D'ESSAI MEQUALTECH

18C-088

Nous certifions que les renseignements concernant ce résultat sont exactes et que les essais de soudage ont été préparés, soudé et exécutés conformément aux exigences de la section IX du code ASME. *We certify that statements in this record are correct and that the test weld prepared, weld and test in accordance with the requirement of ASME code IX.*

Nom du soudeur, symbole / *Welder's name, stamp no.*

Joel St-Hilaire (J)

Signature du représentant de l'entreprise / *Company representative signature*

2018-03-

Réservé aux autorités / *Departement use only*

Pièce soudée le: *Welded on:* 6 MARS 2018 Inspecteur: *Inspector:* i.c. (Y) for M.M.

Résultats vérifiés: *Verified on:* 03 AVR. 2018 Inspecteur: *Inspector:* i.c. (Y)

QC RÉGIE DU BÂTIMENT MTL 310.6 ENREGISTRÉ SELON LA LOI SUR LES APPAREILS SOUS PRESSION (R.L.Q.) VÉRIFIÉ PAR i.c. (Y) DATE 03 AVR. 2018

LABORATOIRE D'ESSAI MEQUALTECH
8740 Boul. PIE IX
Montréal, Qc, H1Z 3V1
Tel: (514) 593-5755 Fax: (514) 593-8338

RAPPORT D'ESSAI DE PLIAGE
BEND TEST REPORT

CLIENT: ABF CONSTRUCTION
ADRESSE / ADDRESS: 138, Chemin des Boisés
Val-d'Or (secteur Dubuisson), Qc
J9P 4N7
CONTACT: Rocky Pelletier

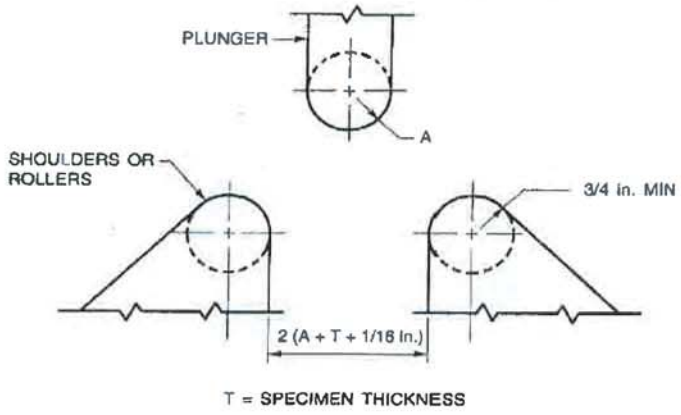
BON DE COMMANDE / P.O. #:	# TRAVAIL / JOB #:	PROCEDURE MEQUALTECH:		Rev.	
16651-20155	WPS# SMAW-P1-P1 Rev.0		P4b-PLI-06		0

IDENTIFICATION	ACC.	REJ.	DÉFAUT / DEFECT	SENS DU PLIAGE / BEND DIRECTION		
				RACINE / ROOT	FACE	CÔTÉ / SIDE
PQR# SMAW-P1-P1 A	☐	☐				
Specimen #2	☑	☐			X	
Specimen #3	☑	☐		X		
Specimen #5	☑	☐			X	
Specimen #6	☑	☐		X		
	☐	☐				
	☐	☐				
	☐	☐				
	☐	☐				
	☐	☐				
	☐	☐				

MÉTHODE / METHOD

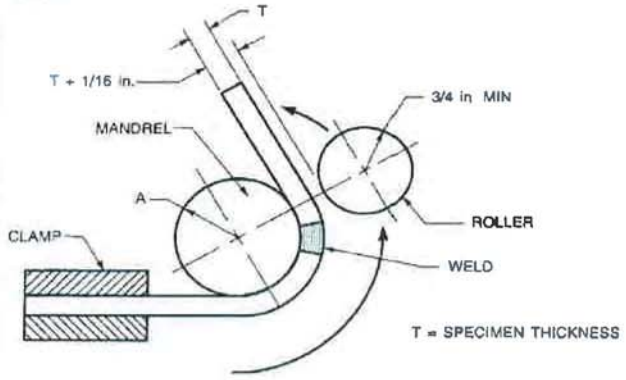
Rayon de Mandrin / Mandrel rad. (A)	0,67 inch	ANGLE DE PLIAGE / BEND ANGLE	180°

☑



T = SPECIMEN THICKNESS

☐



CRITÈRES D'ACCEPTATION / ACCEPTANCE CRITERIA: ASME Section IX Edition 2017 - QW-163

RÉSULTATS / RESULTS : ☑ CONFORME ☐ NON-CONFORME

REMARQUE(S) / REMARK(S):

PQR# SMAW-P1-P1 A.
Pipe 4"X 0,337", SA-333 grade 6 to Flange SA-350 grade LF2.
Position 6G.

The parts being tested are kept for a one month period after the results have been sent. Test results apply only to the parts being tested.
This report can not be reproduced, except completely, without a written autorisation from the laboratory.

ESSAIS EFFECTUÉS PAR / TESTS PERFORMED BY:

Pascal Morin, ing.	Chef de service	2018-03-16
TECHNICIEN / TECHNICIAN OPERATEUR / OPERATOR	QUALIFICATION	DATE

GROUPE MEQUALTECH

LABORATOIRE D'ESSAI MEQUALTECH
8740 Boul. PIE IX
Montréal, Qc, H1Z 3V1
Tel: (514) 593-5755 Fax: (514) 593-8338

RAPPORT D'ESSAI DE TRACTION
TENSILE TEST REPORT

CLIENT: ABF CONSTRUCTION
ADRESSE / ADDRESS: 138, Chemin des Boisés
Val-d'Or (secteur Dubuisson), Qc
J9P 4N7
CONTACT: Rocky Pelletier

BON DE COMMANDE / P.O. #:	# TRAVAIL / JOB #:	STANDARD D'ESSAI / STANDARD:	ASME SECTION IX
16651-20155	WPS# SMAW-P1-P1 Rev.0	Procédure Mequaltech procedure	P4b-TRA-05

INSTRUMENT:	MARQUE / TRADE MARK :	MODÈLE / MODEL# :	SÉRIE / SERIAL# :
	Tinius Olsen	Standard 60,000 Lbs	115,925

IDENTIFICATION ET RÉSULTATS / IDENTIFICATION AND RESULTS	ÉCHANTILLON / SAMPLE			
ÉPROUVETTE / SAMPLE :	#1	#4		
DIAMÈTRE INITIALE / INITIAL DIAMETER (IN):				
LARGEUR INITIALE/ INITIAL WIDTH (IN) :	0,756	0,758		
ÉPAISSEUR INITIALE / INITIAL THICKNESS (IN) :	0,328	0,335		
SURFACE INITIALE / INITIAL SURFACE (square inches):	0,2480	0,2539		
CHARGE ULTIME / MAXIMUM LOAD (lbs):	19375	19475		
LIMITE D'ÉLASTICITÉ À 0,2% / 0,2% YIELD POINT (lbs) :				
LIMITE D'ÉLASTICITÉ À 0,5% / 0,5% YIELD POINT (lbs) :				
DIAMÈTRE FINALE / FINAL DIAMETER (IN):				
LARGEUR FINALE/ FINAL WIDTH (IN) :				
ÉPAISSEUR FINALE / FINAL THICKNESS (IN) :				
SURFACE FINALE / FINAL SURFACE (square inches):				
CONTRAINTE ULTIME / ULTIMATE TENSILE STRENGTH (PSI):	78135	76694		
CONTRAINTE ULTIME / ULTIMATE TENSILE STRENGTH (Mpa) :	539	529		
LIMITE D'ÉLASTICITÉ À 0,2% / 0,2% YIELD STRENGTH (PSI) :				
LIMITE D'ÉLASTICITÉ À 0,2% / 0,2% YIELD STRENGTH (Mpa) :				
LIMITE D'ÉLASTICITÉ À 0,5% / 0,5% YIELD STRENGTH (PSI) :				
LIMITE D'ÉLASTIITÉ À 0,5% / 0,5% YIELD STRENGTH (Mpa):				
:LONGUEUR INITALE / INITIAL LENGTH (IN)				
LONGUEUR FINALE / FINAL LENGTH (IN):				
ALLONGEMENT / ELONGATION (%) :				
STRICTION / REDUCTION OF AREA (%) :				
RUPTURE / BREAK :	BASE MATERIAL	BASE MATERIAL		
FACIES DE RUPTURE/ TYPE OF BREAK:	Ductile	Ductile		

CRITERES D'ACCEPTATION / ACCEPTANCE CRITERIA: ASME Section IX Edition 2017 - QW-153

RÉSULTATS / RESULTS : ☑ CONFORME ☐ NON-CONFORME

REMARQUE(S) / REMARK(S):

PQR# SMAW-P1-P1 A.

Pipe 4"X 0,337", SA-333 grade 6 to Flange SA-350 grade LF2.

Position 6G.

The parts being tested are kept for a one month period after the results have been sent. Test results apply only to the parts being tested.

This report can not be reproduced, except completely, without a written autorisation from the laboratory.

ESSAIS EFFECTUÉS PAR / TESTS PERFORMED BY:

Pascal Morin, ing.	Chef de service	2018-03-16
TECHNICIEN / TECHNICIAN OPÉRATEUR / OPERATOR	QUALIFICATION	DATE

GROUPE MEQUALTECH

LABORATOIRE D'ESSAI MEQUALTECH
8740 Boul. PIE IX
Montréal, Qc, H1Z 3V1
Tel: (514) 593-5755 Fax: (514) 593-8338

RAPPORT D'ESSAI DE RÉSILIENCE
IMPACT TEST REPORT

CLIENT: ABF CONSTRUCTION
ADRESSE / ADDRESS: 138, Chemin des Boisés, Val-d'Or (secteur Dubuisson), Qc, J9P 4N7
CONTACT: Rocky Pelletier

BON DE COMMANDE / P.O. #:	# DE CONTRAT / JOB #:	PROCEDURE MEQUALTECH:		Rev.	
16651-20155	WPS# SMAW-P1-P1 Rev.0		P4b-RES-03		0

INSTRUMENT:	MARQUE / TRADE MARK :	MODÈLE / MODEL# :	# DE SÉRIE / SERIAL# :
	Satec	SI-1C3	1628

DESCRIPTION DE LA PIÈCE OU PROCÉDÉS DE SOUDAGE / PART DESCRIPTION OR WELDING PROCESS DETAIL :

PQR# SMAW-P1-P1 A - Pipe 4" X 0,337" (SA-333 grade 6) to Flange SA-350 grade LF2.

TEMPÉRATURE :	-45°C	RÉSULTATS/ RESULTS (FT.LBS OU/OR JOULES) :	☐ FT./LBS ☑ JOULES	DIMENSIONS:	7 mm X 10 mm

	ÉNERGIE ABSORBÉE / ABSORBED ENERGY	EXPANSION LATÉRALE / LATERAL EXPANSION(Mils)	% DE CISAILLEMENT / SHEAR %	CASSÉ / BREAK
WELD				
	95	81	60	☑
	36	32	40	☑
	89	71	60	☑
				☐
				☐
				☐
HAZ - Pipe SA-333 grade 6 side				
	87	74	70	☑
	89	75	60	☑
	49	43	50	☑
				☐
				☐
				☐
HAZ - Flange SA-350 grade LF2 side				
	124	77	85	☑
	119	80	85	☑
	153	84	100	☑
				☐
				☐
				☐

CRITERES D'ACCEPTATION / ACCEPTANCE CRITERIA: ASME B31.3-2016 Table 323.3.5 = 20 Joules minimum*

RÉSULTATS / RESULTS : ☑ CONFORME ☐ NON-CONFORME

REMARQUE(S) / REMARK(S):

*70% subsize specimens used: Acceptance criteria becomes 14 Joules minimum average.

The parts being tested are kept for a one month period after the results have been sent. Test results apply only to the parts being tested.
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ESSAIS EFFECTUÉS PAR / TESTS PERFORMED BY:

Pascal Morin, ing.	Chef de service	2018-03-16
TECHNICIEN / TECHNICIAN OPERATEUR / OPERATOR	QUALIFICATION	DATE

GROUPE MEQUALTECH

2

Préparé par
CONSULTANTS EN SOUDAGE MEQUALTECH Pour
16C-224

ÉPREUVE DE SOUDEUR OU D'OPÉRATEUR
WELDER OR WELDING OPERATOR QUALIFICATION TEST

Note: Les titres désignent également les hommes et les femmes

A. B. F Construction
1310, Avenue Davy,
Rouyn-Noranda,
Québec Canada J9Y 0A8

Désignation de la DMS / ***Using WPS No.***: SMAW-11-1

Enregistrement provincial / ***Provincial registration***: RN-72.6

Nom du soudeur ou opérateur / ***Welder or operator's name***: CAMIRAND, SÉBASTIEN (SC)

	Variables / ***Variables***	**Inscrire valeurs** / ***Record actual values***		**Gamme qualifiée** / ***Qualification range***	
QW-353 Procédé/*ess*	Shielded metal arc welding	SMAW F3 Manuel / *Manual*	SMAW F4 Manuel / *Manual*	**SMAW F3** Manuel / *Manual*	**SMAW F4** Manuel / *Manual*
QW-403 Métaux de base / *Base metals*	Matériaux / *Material*	P1 à/*to* P1	P1 à/*to* P1	**(P1 à/*to* P15F) (P34) (P41 à/*to* P49)**	**(P1 à/*to* P15F) (P34) (P41 à/*to* P49)**
	Diamètre / *Diameter*	2.375" D E / *O D*	2.375" D E / *O D*	**≥ 1" D.E / *O.D***	**≥ 1" D.E / *O.D***
	Chanf. épaisseur / *Groove thick*	0.343"	0.343"	**Aucune limite / *No limit***	**Aucune limite / *No limit***
	Angle épais. / *Fillet thickness*	Tous / *All*	Tous / *All*	**Aucune limite / *No limit***	**Aucune limite / *No limit***
QW-408 Gas / *Gaz*	Gaz de soutien / *Backing gas*	N/A	N/A	**N/A**	**N/A**
QW-409 Électricité / *Electrecity*	Courant / *Current*	CC / *DC*	CC / *DC*	**Tous / *All***	**Tous / *All***
	Polarité / *Polarity*	EP / *RP*	EP / *RP*	**Tous / *All***	**Tous / *All***
	Mode transfert / *Transfer mode*	N/A	N/A	**N/A**	**N/A**
QW-404 Métaux d'apport / *Filler metals*	No spec. / Spec No (SFA)	5.1	5.1	**5.1 5.4 5.5**	**5.1 5.4 5.5**
	AWS Classe / *Class*	F3 E-6010	F4 E-7018	**F3**	**F1, F2, F4**
	Dépôt soudure / *Weld deposit*	0.125"	0.218"	**0.250" Maximum**	**0.436" Maximum**
	Pièce inserée / *Insert*	Aucune / *None*	Aucune / *None*	**N/A**	**N/A**
QW-402 Joint	Soutien / *Backing*	Sans soutien *Without backing*	Avec soutien *With backing*	**Avec ou sans soutien *With or without backing***	**Avec soutien *With backing***
QW-405 Position	Position / *Progression*	6G Montant / *Up*	6G Montant / *Up*	**Toutes positions-montant *All positions-up***	**Toutes positions-montant *All positions-up***
QW-360 Machine	Automatique / *Automatic*	N/A	N/A	**N/A**	**N/A**

Résultat de pliage ou de radiographie / ***Guided bend or radiographic results***

QW-191 Specimens	Pliage de coté *Side bend*	Pliage transversal *Transverse bend*	Pliage longitudinal *Longitudinal bend*	Radiogrphie *Radiographic*	**ACCEPTÉ** / ***QUALIFIED***	**REFUSÉ** / ***REFUSED***
				√	**ACCEPTÉ**	

QW-194 Visu / el / *al*: Pénétration complète, fusion complète / *Complete joint penetration, complete fusion*

LABORATOIRE D'ESSAI MEQUALTECH

ONGC/ASNT-TC-1A Level II

Nous certifions que les renseignements ci-dessus sont exacts et que les essais de soudage ont été preparés et executés conformement aux exigences de la section IX du Code ASME
We certify that the statements in this record are correct and the test welds were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Code

Entreprise / ***Organization***

A. B. F Construction

Organisme autorisé / ***Accredited organization***

Soudé le: / *Welded on*: OCT 17 2019

Inspecteur: / *Inspetor.*

Accepté: / *Accepted.*

Vérifié le : / *Inspected on*

Inspecteur / *Inspector*

Refusé: / *Refused*

Préparé par
CONSULTANTS EN SOUDAGE MEQUALTECH Pour:
16C-224

ÉPREUVE DE SOUDEUR OU D'OPÉRATEUR
WELDER OR WELDING OPERATOR QUALIFICATION TEST

Note: Les titres désignent également les hommes et les femmes.

A. B. F Construction
127-A, Avenue Marcel-Baril,
Rouyn-Noranda
Québec Canada J9X-7B9

Désignation de la DMS *Using WPS No.*	Enregistrement provincial *Provincial registration*
SMAW-11-1	RN-72.6

Nom du soudeur ou opérateur / *Welder or operator's name*

CAOUETTE FRANÇOIS (F)

	Variables *Variables*	Inscrire valeurs *Record actual values*		Gamme qualifiée *Qualification range*	
QW-353 Proc/édé/ess	Shielded metal arc welding	SMAW F3 Manuel / *Manual*	SMAW F4 Manuel / *Manual*	**SMAW F3** Manuel / *Manual*	**SMAW F4** Manuel / *Manual*
QW-403 Métaux de base *Base metals*	Matériaux / *Material*	P1 à/*to* P1	P1 à/*to* P1	**(P1 à/*to* P15F) (P34) (P41 à/*to* P49)**	**(P1 à/*to* P15F) (P34) (P41 à/*to* P49)**
	Diamètre / *Diameter*	2.375" D.E / *O.D*	2.375" D.E / *O.D*	**≥ 1" D.E / *O.D***	**≥ 1" D.E / *O.D***
	Chanf. épaisseur / *Groove thick.*	0.343"	0.343"	**Aucune limite / *No limit***	**Aucune limite / *No limit***
	Angle épais. / *Fillet thickness*	Tous / *All*	Tous / *All*	**Aucune limite / *No limit***	**Aucune limite / *No limit***
QW-408 Gaz / *Gaz*	Gaz de soutien / *Backing gas*	N/A	N/A	**N/A**	**N/A**
QW-409 Électricité *Electrecity*	Courant / *Current*	CC / *DC*	CC / *DC*	**Tous / *All***	**Tous / *All***
	Polarité / *Polarity*	EP / *RP*	EP / *RP*	**Tous / *All***	**Tous / *All***
	Mode transfert / *Transfer mode*	N/A	N/A	**N/A**	**N/A**
QW-404 Métaux d'apport *Filler metals*	No spec. / Spec No (SFA)	5.1	5.1	**5.1 5.4 5.5**	**5.1 5.4 5.5**
	AWS Classe / *Class*	F3 E-6010	F4 E-7018	**F3**	**F1, F2, F4**
	Dépôt soudure / *Weld deposit*	0.125"	0.218"	**0.250" Maximum**	**0.436" Maximum**
	Pièce inserée / *Insert*	Aucune / *None*	Aucune / *None*	**N/A**	**N/A**
QW-402 Joint	Soutien / *Backing*	Sans soutien *Without backing*	Avec soutien *With backing*	**Avec ou sans soutien *With or without backing***	**Avec soutien *With backing***
QW-405 Position	Position / *Progression*	6G Montant / *Up*	6G Montant / *Up*	**Toutes positions-montant *All positions-up***	**Toutes positions-montant *All positions-up***
QW-360 Machine	Automatique / *Automatic*	N/A	N/A	**N/A**	**N/A**

Résultat de pliage ou de radiographie / *Guided bend or radiographic results*

QW-191 Specimens	Pliage de coté *Side bend*	Pliage transversal *Transverse bend*	Pliage longitudinal *Longitudinal bend*	Radiogrphie *Radiographic*	**ACCEPTÉ / *QUALIFIED***	**REFUSÉ / *REFUSED***
				√	✓	

QW-194 Visu / el / *al*: Pénétration complète, fusion complète
Complete joint penetration, complete fusion

LABORATOIRE D'ESSAI MEQUALTECH

ONG/ASNT-TC-1A Level II

18M4079-1 2018-09-21

Nous certifions que les renseignements ci-dessus sont exacts et que les essais de soudage ont été preparés et executés conformement aux exigences de la section IX du Code ASME.
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Entreprise / *Organization*

A. B. F Construction

Organisme autorisé / *Accredited organization*

Soudé le: 14 SEPT 2018
Welded on:

Inspecteur:
Inspetor:

Accepté:
Accepted:

Vérifié le :
Inspected on.

Inspecteur
Inspector:

Refusé:
Refused:

Préparé par:
CONSULTANTS EN SOUDAGE MEQUALTECH Pour:
16C-224

ÉPREUVE DE SOUDEUR OU D'OPÉRATEUR
WELDER OR WELDING OPERATOR QUALIFICATION TEST

Note: Les titres désignent également les hommes et les femmes.

A. B. F Construction
1310, Avenue Davy,
Rouyn-Noranda
Québec Canada J9Y 0A8

Désignation de la DMS *Using WPS No.*	Enregistrement provincial *Provincial registration*
SMAW-11-1	RN-72.6

Nom du soudeur ou opérateur / *Welder or operator's name*: ST-HILAIRE JOEL (J)

	Variables *Variables*	Inscrire valeurs *Record actual values*		Gamme qualifiée *Qualification range*	
QW-353 Proc/éde/ess	Shielded metal arc welding	SMAW F3 Manuel / *Manual*	SMAW F4 Manuel / *Manual*	**SMAW F3** Manuel / *Manual*	**SMAW F4** Manuel / *Manual*
QW-403 Métaux de base *Base metals*	Matériaux / *Material*	P1 à/*to* P1	P1 à/*to* P1	**(P1 à/*to* P15F) (P34) (P41 à/*to* P49)**	**(P1 à/*to* P15F) (P34) (P41 à/*to* P49)**
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	Chanf. épaisseur / *Groove thick.*	0.343"	0.343"	**Aucune limite / *No limit***	**Aucune limite / *No limit***
	Angle épais. / *Fillet thickness*	Tous / *All*	Tous / *All*	**Aucune limite / *No limit***	**Aucune limite / *No limit***
QW-408 Gas / *Gaz*	Gaz de soutien / *Backing gas*	N/A	N/A	**N/A**	**N/A**
QW-409 Électricité *Electrecity*	Courant / *Current*	CC / *DC*	CC / *DC*	**Tous / *All***	**Tous / *All***
	Polarité / *Polarity*	EP / *RP*	EP / *RP*	**Tous / *All***	**Tous / *All***
	Mode transfert / *Transfer mode*	N/A	N/A	**N/A**	**N/A**
QW-404 Métaux d'apport *Filler metals*	No spec. / Spec No (SFA)	5.1	5.1	**5.1 5.4 5.5**	**5.1 5.4 5.5**
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	Dépôt soudure / *Weld deposit*	0.125"	0.218"	**0.250" Maximum**	**0.436" Maximum**
	Pièce inserée / *Insert*	Aucune / *None*	Aucune / *None*	**N/A**	**N/A**
QW-402 Joint	Soutien / *Backing*	Sans soutien *Without backing*	Avec soutien *With backing*	**Avec ou sans soutien *With or without backing***	**Avec soutien *With backing***
QW-405 Position	Position / *Progression*	6G Montant / *Up*	6G Montant / *Up*	**Toutes positions-montant *All positions-up***	**Toutes positions-montant *All positions-up***
QW-360 Machine	Automatique / *Automatic*	N/A	N/A	**N/A**	**N/A**

Résultat de pliage ou de radiographie / *Guided bend or radiographic results*

	Pliage de coté *Side bend*	Pliage transversal *Transverse bend*	Pliage longitudinal *Longitudinal bend*	Radiogrphie *Radiographic*	ACCEPTÉ / *QUALIFIED*	REFUSÉ / *REFUSED*
QW-191 Specimens				√	✓	

QW-194 Visu / el / *al*: Pénétration complète, fusion complète
Complete joint penetration, complete fusion

LABORATOIRE D'ESSAI MEQUALTECH

ONGC/ASNT NDT-1A Level II

2018-09-21 18M4079-11

Nous certifions que les renseignements ci-dessus sont exacts et que les essais de soudage ont été préparés et exécutés conformement aux exigences de la section IX du Code ASME
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Entreprise / *Organization*

A. B. F Construction

Organisme autorisé / *Accredited organization*

Soudé le: *Welded on*: 14-SEPT - 2018
Inspecteur: *Inspetor*:
Accepté: *Accepted*:

Vérifié le : *Inspected on*
Inspecteur *Inspector*:
Refusé: *Refused*

3

PROCEDURE FOR PNEUMATIC TESTING OF PIPING ASSEMBLY

(PROCÉDURE D'ESSAIS SUR TUYAUTERIE PAR ÉPREUVE PNEUMATIQUE)

1.0 GOAL *(But)* :

Defining the procedure for testing of piping assembly. *(Définir la procédure d'essais des assemblages de tuyauterie.)*

2.0 APPLICATION *(Domaine d'application)* :

This Procedure is intended to describe the pneumatic testing methodology for piping assemblies at Agnico-Eagle Div. Meadowbank Project, NU. *(Cette procédure s'applique à définir la méthodologie d'essai d'étanchéité des assemblages de tuyauterie à Agnico-Eagle Div. Meadowbank Project, NU.)*

3.0 RESPONSABILITIES *(Responsabilités)* :

Work is performed by ABF Mines inc., pipefitters performing the test are responsible for the quality and safety of their work. The foreman supervises and witnesses the quality and safety of the testing. AEM representative verifies and approves each test. *(Les travaux sont réalisés par ABF Mines Inc., les tuyauteurs qui réalisent les essais sont responsables de la qualité et de la sécurité de leurs travaux, le CTM supervise les travaux et témoigne de tous les essais. Le représentant d'AEM inc. vérifie et approuve les essais réalisés.)*

4.0 METHODOLOGY (Méthodologie) :

The work consists of testing on piping assemblies according to the present procedures by ABF Mines Inc. *(Les travaux consistent à la réalisation d'essais sur les assemblages de tuyauterie selon la présente procédure par ABF Mines inc.)*

5.0 STEPS *(Étapes)*:

Advise 24hr prior to testing, the AEM supervisor in charge of the piping installation, of the time of test. *(Aviser par courriel 24 heures à l'avance le représentant d'AEM de l'exécution des essais pneumatiques.)*

Every piping assembly, subject to testing is inspected for any restriction. Piping is then coupled with appropriate instrument and pressure gage. *(Chaque ensemble de tuyauterie fabriqué et à inspecter, est inspecté pour toute obstruction de manière appropriée. Ilest ensuite couplé adéquatement des raccords, nourrice, purge et d'instruments indicateurs de pression.)*

The area is cleared and barricaded with red (danger) tape at reasonable and secure distance. *(Le secteur est évacué, des rubans de délimitation rouge (Danger) sont installés à une distance raisonnable et sécuritaire).*

The pressure for testing is determined on 1.2X the service pressure as per system specifications, every instrument below that set pressure is remove for testing. Maximum testing pressure allowed is 690kPa/100Psi. *(Les pressions d'essais sont déterminées à 1.2X la pression de service selon la spécification du système. Si une unité performe en deçà de cette pression d'utilisation, elle est isolé pour la duré du test. La pression maximale autorisée est de 690kPa/100Ps.)*

The pressure is raised in three (3) equal stages. With a 10 min. waiting period between each increase until maximum pressure is obtained. *(La pression maximale est obtenue en trois étapes, d'égale pression, avec 15 min. d'attente entre chaque augmentation de pression.)*

The testing pressure is maintained without pressure drop, nor leak, for a minimum of one hour. *(La pression d'essais est maintenue, sans baisse de pression, ni fuite, pendant une durée minimale d'une heure.)*

In case of pressure drop, potential leaks are spotted using soapy water (Snoop). Any leak is then isolated, purged and repaired. Pressure is then raised back to testing pressure for a full one (1) hour phase. *(En cas de baisse de pression, l'application d'un détecteur de fuite à base d'eau savonneuse (Snoop) est appliqué sur toute la surface des joints suspects. Toute fuite est isolée, la ligne purgée et réparée. La pression est rétablie dans tout le réseau pour une heure complète.)*

The testing is concluded by purging the air, this process is also used to remove all loose fine particles inside the system. Instruments of calibration are reinstalled. *(Après la conclusion de l'épreuve, l'air est purgé et les équipements de calibration réinstallés.)*

All parts of system then tested is identified as so on the quality control's P'nID.
(Les ensembles testés seront identifiés sur le diagramme de procédé réservé à cet effet)

The inspection report is signed by participants and preserved for future reference. *(La fiche d'inspection signée sera classée et conservée dans le cartable à cet effet pour futures références.*

6.0 ÉQUIPEMENTS :

- Appropriate Gauge *(Manomètres)*
- Temporary Piping *(Tuyauterie temporaire)*
- Fittings, Flanges, Blind-Flanges, Spectacle-blind, hoses and valves.
  (Raccords, brides, brides pleines ou plaques d'obturation, boyau et robinet)
- Vents *(Évents)*
- Compressor *(Compresseur)*
- Soapy water *(Eau* Savonneuse)

RÉFÉRENCES

© Typical procedure Xenit Industries inc.

4

ABF ARCTIC

AEM / MPEI fuel tank Baker Lake

Project no. 6120-C-265-001

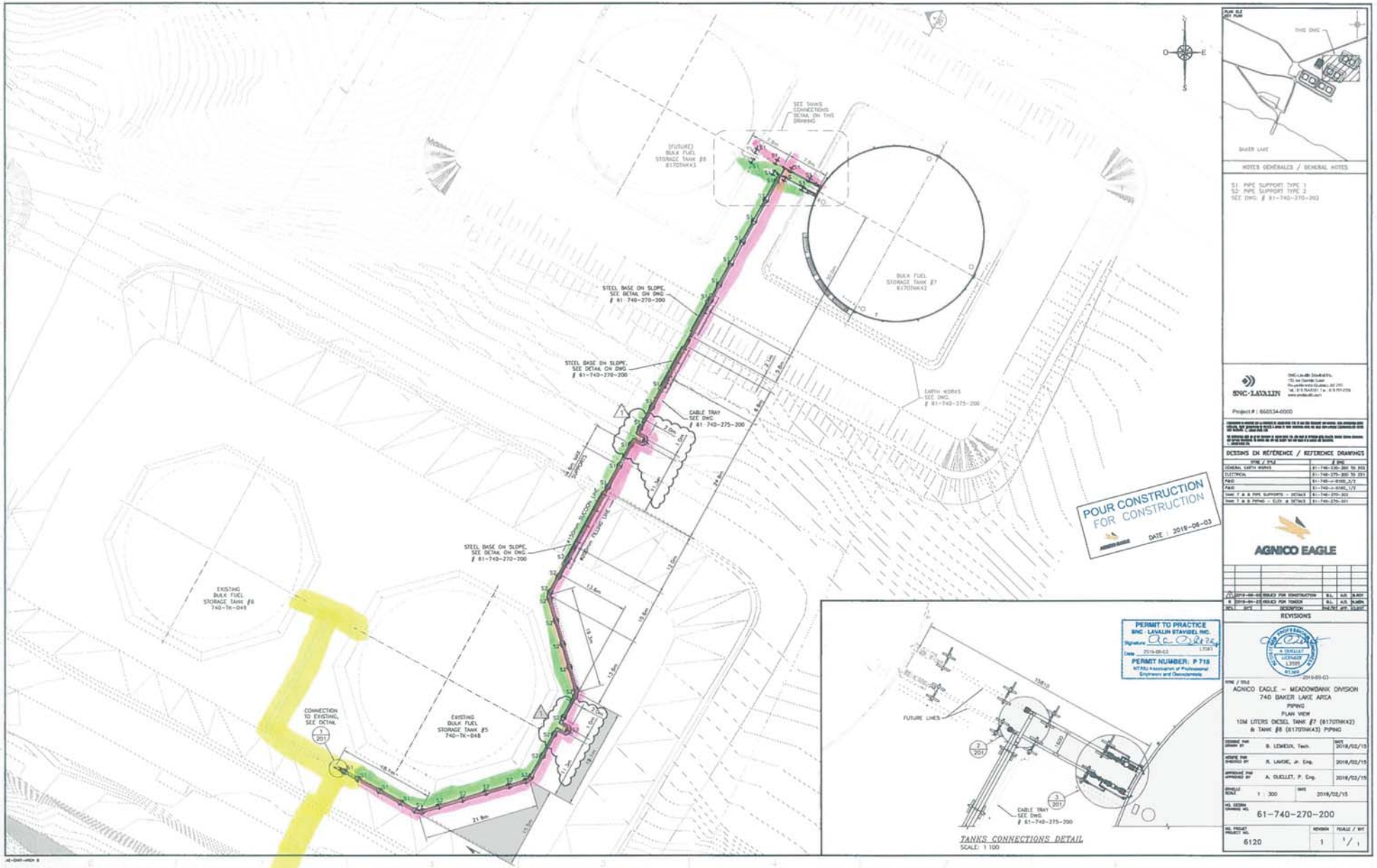
Piping Pressure testing Report

Date	Hydro (Check)	AIR (Check)	Line # or Piping localisation From	To	Service	Test Pressure (Psi)	Time	Result¹ Ok	Result¹ Drop	Result² Ok	Result² Drop
2019-09-14		✓	Tank 5/6	Tie in.		50 psi	16:56	✓		✓ (3bf)	
2019-09-15		✓	Tie in Line 6"	to the tank 7		50 PSI	13:00.	✓		✓	
2019-09-17		✓	Tie in Line 8"	to the tank 7		50 PSI	11:50	✓		✓ (8f)	

(Signature) (date) (Print) Rep. ABF Arctic

(Signature) (date) (Print) Rep. AEM

(Signature) (date) (Print) Rep. Gov. (If required)


(FUTURE)
BULK FUEL
STORAGE TANK #8
61701MK43
SEE TANKS
CONNECTIONS
DETAIL ON THIS
DRAWING
BULK FUEL
STORAGE TANK #7
61701MK42
STEEL BASE ON SLOPE,
SEE DETAIL ON DWG
61-740-270-200
CABLE TRAY
SEE DWG
61-740-275-200
EARTH WORKS
SEE DWG
61-740-275-200
EXISTING
BULK FUEL
STORAGE TANK #6
740-TK-048
EXISTING
BULK FUEL
STORAGE TANK #5
740-TK-048
CONNECTION
TO EXISTING,
SEE DETAIL
FUTURE LINES
TANKS CONNECTIONS DETAIL
SCALE: 1:100
POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 2019-06-03
PERMIT TO PRACTICE
SNC-LAVALIN STANTEC INC.
PERMIT NUMBER: P 715
NOTES GÉNÉRALES / GENERAL NOTES
S1: PIPE SUPPORT TYPE 1
S2: PIPE SUPPORT TYPE 2
SEE DWG # 61-740-270-202
SNC-LAVALIN
Project # : 660534-0000
DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS
AGNICO EAGLE
REVISIONS
ACHICO EAGLE – MEADOWBANK DIVISION
740 BAKER LAKE AREA
PIPING
PLAN VIEW
10M LITERS DIESEL TANK #7 (61701MK42)
& TANK #8 (61701MK43) PIPING
B. LEMIEUX, Tech.
R. LAVOIE, Jr. Eng.
A. OUELLET, P. Eng.
1 : 300
2019/02/15
61-740-270-200
6120
1

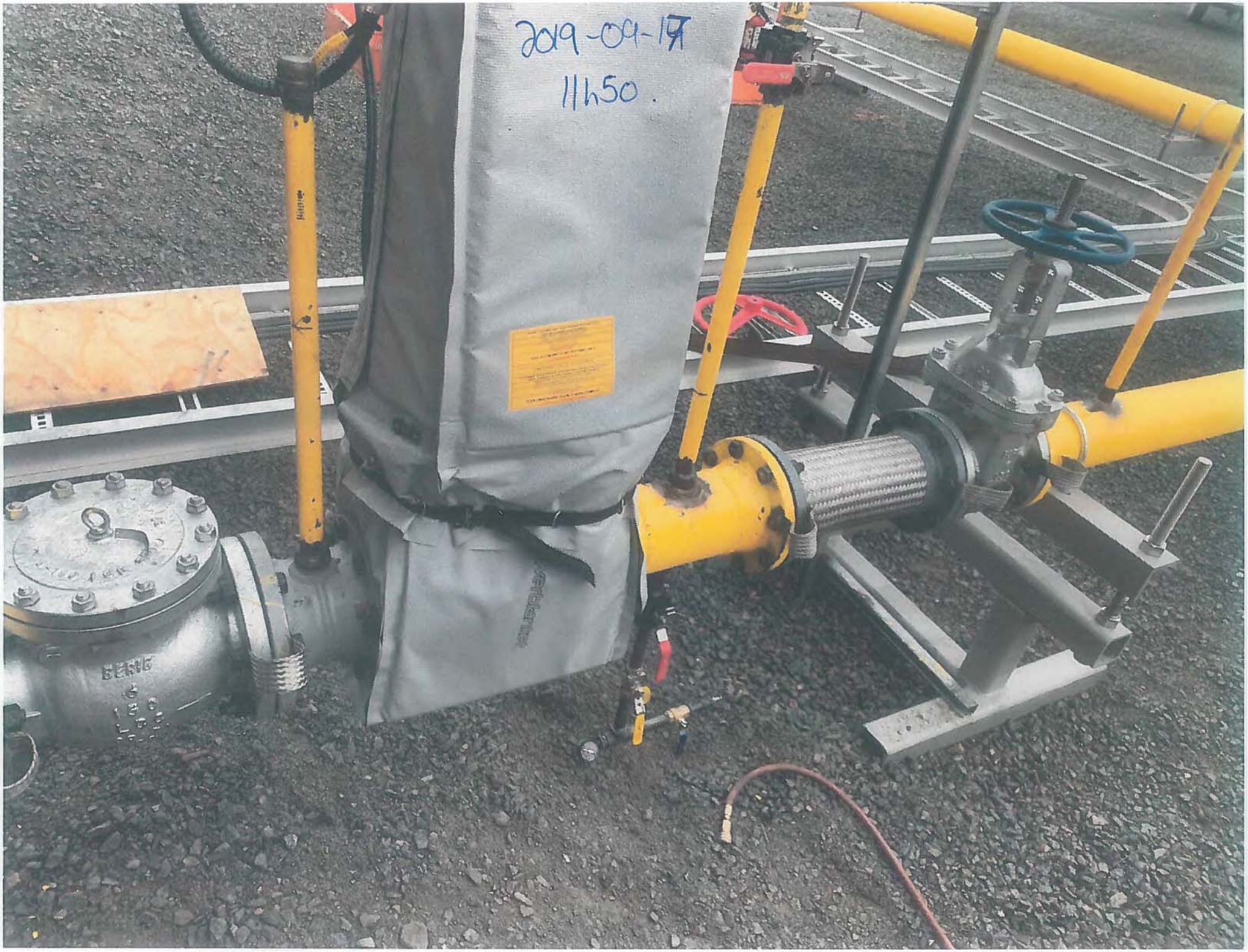

2019-09-14.
17h56.
NORGREN
IMI
MPa
bar
psi


2021-09-15
17h22
NORGREN
IMI
MPa
bar
psi


2019-09-15.
17:22.

2019-09-15
13:02.


2019-09-15
14:30
NORGREN
IMI
MPa
bar
psi


2019-09-17
11h50.


MPa
bar
psi
NORGREN
IMi

5

MLTS_6056-18731
Heat# SEE BELOW

CCTF CORPORATION

4151 North Service Road, Burlington, ON L7L 4X6 (905) 335-5320

Date: 6/5/2019

Mill Test Reports

Invoice: 1596625-00
PO: 4072649

Customer: 49300-001
A.B.F MINES INC (ROUYN NORANDA
LIVRER A EQUIPEMENT KN
8254 RANG DU VIEUX PONT
ROUYN-NORANDA, QC J9Y 0H4

Line	Heat#	Product	Description
2	176433	2530031	1 A333-6 STD BLK SMLS SRL
3	141352	2530074	2 A333-6 STD BLK SMLS SRL
4	610879	2530090	4 A333-6 STD BLK SMLS SRL
5	175147	2530104	6 A333-6 STD BLK SMLS SRL
5	178322	2530104	6 A333-6 STD BLK SMLS SRL
6	175142	2530112	8 A333-6 STD BLK SMLS SRL
6	175146	2530112	8 A333-6 STD BLK SMLS SRL
6	176433	2530112	8 A333-6 STD BLK SMLS SRL
6	177833	2530112	8 A333-6 STD BLK SMLS SRL

Heat codes followed by ** have been corrected, change may not show on the packing slip

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Vallourec Soluções Tubulares do Brasil S.A.
Barreiro Plant - Av. Olinto Meireles, 65
ZIP 30640-010 - Belo Horizonte, MG

EcoTube

RINA
ISO 9001 - ISO/TS 16949
ISO 14001 - ISO 50001 - OHSAS 18001
Certified management systems

Inspection Certificate
(According to DIN EN 10204.3.1)
N°.: 0030030837 / 00 Sheet: 1 / 4

Customer: VALLOUREC CANADA INC

Country: Canada

Material Number: 276243
Work Order: 531796 / 10
Customer Order: VM-4682 - P.O 4038589-00

Inspection: Vallourec Soluções Tubulares do Brasil S.A.

PRODUCT: SEAMLESS STEEL PIPE, HOT FINISHED , PLAIN ENDS , NORMALIZED
DIMENSIONS: 33,40 mm X 3,38 mm **SCHEDULE:** 040 **GRADE:** GRADE 290 # GR 1 # 6 # B 1 STD 2530031
STANDARD: CSA-Z245.1-14 - CATEGORY II
IN ACCORDANCE ALSO TO THE STANDARDS: ASTM A 333M - 16 ASTM A 999M - 18 # ASTM A 106M - 18 ASTM A 530M - 12 # ASTM A 53M - 12 # ASME SA-333M - 17 ASME SA 999M - 17 # ASME SA-106M - 17 ASME SA 530M - 17
CUSTOMER SPECIFICATION: CCTF GrB,1,6,290 Cat II SS , 20.11.2017
SURFACE PROTECTION: EXTERNAL: LACQUER **PIPE ENDS PROTECTOR:** PLASTIC CAP
TOLERANCES: OUTSIDE DIAMETER (PIPE BODY): -0,40 mm / +0,40 mm **WALL THICKNESS:** -0,42 mm / +0,68 mm
TOLERANCES(PIPE ENDS): OUTSIDE DIAMETER: -0,40 mm / +0,40 mm
LENGTH: RANDOM 5486,00 mm - 6706,00 mm
STANDARD MARKING: PAINT STENCILED IN THE PIPE BODY: 531796/10 MANUFACTURER CSA-Z245.1-14 33,40 X 3,38 290 CAT II SS S HN HEAT NUMBER ASTM A/ASME SA 333, 1/6 HF SCH 040 LT -46C ASTM A/ASME SA 106 B 20700 KPA ASTM A 53 B NPS 1" X SCH 40 VSB LOGO
SHIPPING MARKING: NACE MR 0175/NACE MR 0103 - MADE IN BRAZIL * VM4682 / P.O # 4038589-00/ITEM-1 * TORONTO * CCTF

Heat	Pieces
176433	337
Total	**337**

THE PRODUCT IS SATISFACTORY IN THE FOLLOWING TESTS / INSPECTIONS: DIMENSIONAL # VISUAL # FLATTENING TEST # BENDING TEST # ENDS INSPECTION : UNTESTED ENDS CROPPED # HYDROSTATIC TEST: 20700,0 KPA 5 S # RESIDUAL MAGNETISM: MAX 30 GAUSS # ELECTROMAGNETIC TEST : CSAZ245.1-N10,LON/TRAN,OUT/INS # ULTRASONIC TEST FOR LAMINAR DEFECTS: ACC. CSA Z245.1-SOUR SERVICE #

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(According to DIN EN 10204.3.1)
N°.: 0030030837 / 00

Chemical Composition (%)

Process: Basic Oxygen Furnace, heats fully killed

Ceq: CSA-Z245.1-CE11 — Ceq: C+Mn/6+(Cr+Mo+V)/5 +(Ni+Cu)/15 — CE1: Cr + Cu + Mo + Ni + V

		C	Mn	P	S	Si	Ni	Cr	Mo	Al	Cu	V	Nb	B	Ti	N	Ca	Ceq	Ceq	CE1
Heat Analisys	Min		0,400			0,100														
	Max	0,240	1,350	0,025	0,025	0,500	0,400	0,300	0,120		0,400	0,080	0,020	0,0010	0,110			0,400	0,430	1,000
Product Analisys	Min		0,400			0,100														
	Max	0,240	1,350	0,025	0,025	0,500	0,400	0,300	0,120		0,400	0,080	0,020	0,0010	0,110			0,400	0,430	1,000
Heat Control Lot																				
176433 030003101210		0,10	1,27	0,012	0,004	0,28	0,03	0,06	0,01	0,029	0,070	0,004	0,015	0,0004	0,002	0,0099	0,0012	0,265	0,333	0,174
Check 1		0,11	1,29	0,011	0,004	0,29	0,03	0,06	0,01	0,029	0,074	0,005	0,017	0,0003	0,002	0,0098	0,0013	0,277	0,347	0,179
Check 2		0,10	1,29	0,011	0,004	0,29	0,03	0,06	0,01	0,029	0,074	0,005	0,017	0,0003	0,002	0,0088	0,0013	0,267	0,337	0,179

Ceq: Carbon Equivalent; Ceq: Carbon Equivalent; CE: Combined Elements;

Tensile Test

Specimen Direction: Longitudinal — **Temperature:** Room Temperature — **Wall Thickness:** 3,38 mm — **Gage Length:** L0=2"

Method:Elong.Total Under Load 0,50 %

		Type of Specimen	Area (MM2)	YS (MPA)	TS (MPA)	E (%)
Required: Min				290	415	25
Max					625	
Heat Control Lot						
176433 030003101210		FULL SECTION	321,3	349	477	44
		FULL SECTION	330,4	355	490	45

YS-Yield Strength; TS-Tensile Strength; E-Elongation;

Hardness Test Through Wall

Scale: HV

		Individual	MW1	MW2	MW3	Avg
Required: Min						
Max		246,0				
Heat Control Lot						
176433 030003101210	Q1		160,0	159,0	162,0	160,3

MW - Middle Wall;

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ISO 14001 ISO 50001 OHSAS 18001
Certified Management Systems

Inspection Certificate
(According to DIN EN 10204.3.1)
N°.: 0030030837 / 00 Sheet:3 / 4

Impact Test

Test Specimen: CHARPY 10X55X2.5 V NOTCH **Direction:** Longitudinal **Temperature:** -55°C **Striker radius:** 8 mm

	AE1 (J)	AE2 (J)	AE3 (J)	AE4 (J)	AE5 (J)	AE Avg (J)	SA1 (%)	SA2 (%)	SA3 (%)	SA4 (%)	SA5 (%)	SA Avg (%)	LE1 (Mils)	LE2 (Mils)	LE3 (Mils)	LE Avg (Mils)
Required: Min	7	7	7			7	50	50	50			60				
Max																
Heat Control Lot																
176433 030003101210	52	56	55			54	100	100	100			100	55	55	55	55

AE - Absorbed Energy; SA - Shear Area; LE - Lateral Expansion;

Remarks:

1. MATERIAL IN ACCORDANCE WITH NACE MR 0175
PAR. 3.2/ISO 15156-2, ANNEX A.2.1.2/NACE MR0103 PAR.2.1. ALL LATEST
EDITIONS

2. SKU 2530031

3 THE WORKS OPERATE A QUALITY MANAGEMENT SYSTEM ACCORDING TO EUROPEAN
DIRECTIVE 2014/68/UE ANNEX I PAR. 4.3 (CERTIFICATE 2016 BH MP 02-03
VALID UNTIL 12.05.2019).
- MATERIAL ACCORDING TO PED 2014/68/UE ANNEX I PAR. 7.5

"STEEL MADE BY BOF PROCESS"

4. - NO WELD REPAIR
- FREE OF MERCURY CONTAMINATION
- NO RADIOACTIVE CONTAMINATION
- FINE GRAIN PRACTICE
- FULLY KILLED STEEL.
- MATERIAL FROM BRAZIL

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ISO 9001 - ISO/TS 16949
ISO 14001 - ISO 50001 OHSAS 18001
Certified Management Systems

Inspection Certificate
(According to DIN EN 10204.3.1)
N°.: 0030030837 / 00 Sheet:4 / 4

We hereby certify that this product has been manufactured and examined in accordance with all requirements of the standards and specifications and all the results are found to be satisfactory. This testimonial and certificate respectively is recorded by a computer system and is valid without signature. Alteration or use for others products are regarded as falsification of documents and will be subject to criminal jurisdiction.

QUALITY CONTROL DEPARTMENT
FAX: (55-31) 3328-2773

e-mail:luis.silva@vallourec.com

ENG. LUIZ FERNANDO DA SILVA - CREA/MG 58834-D
TECHNICAL RESPONSIBLE

DATE
11.20.2018

vallourec

Vallourec Soluções Tubulares do Brasil S.A.
Barreiro Plant - Av. Olinto Meireles, 65
ZIP 30640-010 - Belo Horizonte, MG

EcoTube

RINA

Inspection Certificate

(According to DIN EN 10204.3.1)

N°.: 0030023868 / 00 Sheet: 1 / 3

Customer: VALLOUREC CANADA INC

Country: Canada

Material Number: 273193
Work Order: 509784 / 10
Customer Order: VM4238/P.O # 4037205-00

Inspection: Vallourec Soluções Tubulares do Brasil S.A

PRODUCT: SEAMLESS STEEL PIPE, HOT FINISHED , BEVELED ENDS 30 DEG. , NORMALIZED
DIMENSIONS: 60.30 mm X 3.90 mm SCHEDULE: 040 GRADE: GRADE 290 # 6 # GR I 2 STD 2530074
STANDARD: CSA-Z245.1-14 - CATEGORY II
IN ACCORDANCE ALSO TO THE STANDARDS: ASTM A 333M - 16 ASTM A 999M - 16 # ASME SA-333M - 15
SURFACE PROTECTION: EXTERNAL: LACQUER PIPE ENDS PROTECTOR: PLASTIC CAP
TOLERANCES: OUTSIDE DIAMETER (PIPE BODY): -0,60 mm / +0,60 mm WALL THICKNESS: -0,49 mm / +0,78 mm
LENGTH: RANDOM 5486,00 mm - 6706,00 mm
STANDARD MARKING: Paint stenciled in the pipe body: 509784/10 MANUFACTURER CSA-Z245.1-14 60.30 X 3,90 290 CAT II SS S HN LENGTH HEAT NUMBER ASTM A/ASME SA 333, 1/6 HF SCH 040 LT -46C NACE MR 0175/NACE MR 0103 VSB LOGO
SHIPPING MARKING: MADE IN BRAZIL * VM4238 / P.O # 4037205-00 * VANCOUVER
TOLERANCES(PIPE ENDS): OUTSIDE DIAMETER: -0,40 mm / +0,80 mm

Heat	Pieces
141352	122
Total	122

THE PRODUCT IS SATISFACTORY IN THE FOLLOWING TESTS / INSPECTIONS: DIMENSIONAL # VISUAL # FLATTENING TEST # ENDS INSPECTION : UNTESTED ENDS CROPPED # HYDROSTATIC TEST: 20700,0 KPA 5 S # RESIDUAL MAGNETISM: MAX 30 GAUSS # TESTE ELETROMAGNÉTICO : ACCORDING TO CSA Z245.1 # ULTRASONIC TEST FOR LAMINAR DEFECTS: ACC. CSA Z245.1-SOUR SERVICE #

Chemical Composition (%)

Process: Basic Oxygen Furnace, heats fully killed

Ceq: CSA-Z245.1-CE11 CE1: Mn/C

		C	Mn	P	S	Si	Ni	Cr	Mo	Cu	V	Nb	B	Ti	Ceq	CE1
Heat Analisys	Min		0,400			0,100										3,000
	Max	0,240	1,350	0,025	0,025	0,500	0,400	0,300	0,120	0,400	0,080	0,020	0,0010	0,110	0,400	
Product Analisys	Min		0,400			0,100										3,000
	Max	0,240	1,350	0,025	0,025	0,500	0,400	0,300	0,120	0,400	0,080	0,020	0,0010	0,110	0,400	
Heat	Control Lot															
141352	030002889902	0,10	1,32	0,020	0,001	0,31	0,01	0,07	0,03	0,010	0,006	0,015	0,0002	0,002	0,342	13,200
	Check 1	0,10	1,32	0,020	0,001	0,31	0,01	0,07	0,03	0,012	0,006	0,016	0,0002	0,002	0,343	12,941
	Check 2	0,10	1,32	0,020	0,001	0,31	0,01	0,07	0,03	0,012	0,006	0,016	0,0002	0,002	0,343	12,816

Ceq: Carbon Equivalent; CE: Combined Elements;

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RINA

Inspection Certificate
(According to DIN EN 10204.3.1)
N°.: 0030023868 / 00

Tensile Test

Specimen Direction: Longitudinal Temperature: Room Temperature Gage Length: L0=2" Method:Elong.Total Under Load 0.50 %

		Type of Specimen	Area (MM2)	YS (MPA)	TS (MPA)	E (%)
	Required: Min			290	415	26
	Max				625	
Heat	Control Lot					
141352	0300023889902	STRIP WIDTH 19.05 MM	83.6	406	517	37

YS-Yield Strength; TS-Tensile Strength; E-Elongation;

Hardness Test Through Wall

Scale: HV

		Individual	AE2	AE3
	Required: Min			
	Max	246.0		

Heat	Control Lot		MW1	MW2	MW3	Avg
141352	0300023889902	Q1	163.0	166.0	160.0	163.0

MW - Middle Wall;

Impact Test

Test Specimen: CHARPY 10X55X2.5 V NOTCH Direction: Longitudinal Temperature: -57°C Striking imp: 8 mm

		AE1 (J)	AE2 (J)	AE3 (J)	AE4 (J)	AE5 (J)	AE Avg (J)
	Required: Min	4	4	4			5
	Max						
Heat	Control Lot						
141352	0300023889902	42	40	46			43

AE - Absorbed Energy;

Remarks:
1. MATERIAL IN ACCORDANCE WITH NACE MR 0175
PAR. 3.2/ISO 15156-2, ANNEX A.2.1.2/NACE MR0103 PAR.2.1. ALL LATEST EDITIONS.

2. SKU 2530074

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Inspection Certificate
(According to DIN EN 10204.3.1)
N°.: 0030023868 / 00 Sheet:3 / 3

3. - MATERIAL SOUR SERVICE AS DEFINED IN PARAGRAPH 16 OF CSA Z241.1, BUT WITHOUT HIC TEST

4. MATERIAL:
- NO WELD REPAR
- FREE OF MERCURY
- FINE GRAIN PRACTICE
- FULLY KILLED STEEL
- MATERIAL FROM BRAZIL

We hereby certify that this product has been manufactured and examined in accordance with all requirements of the standards and specifications and all the results are found to be satisfactory. This testimonial and certificate respectively is recorded by a computer system and is valid without signature. Alteration or use for others products are regarded as falsification of documents and will be subject to criminal jurisdiction.

QUALITY CONTROL DEPARTMENT
FAX: (55-31) 3328-2617

e-mail:gustavo.pinheiro@vallourec.com

DR. GUSTAVO ALVES PINHEIRO - CREA/MG-109170/D
TECHNICAL RESPONSIBLE

DATE
08.14.2017

ECO TUBES: The tubes from Vallourec do Brasil S.A. are manufactured with steel which uses charcoal as a source of energy in its production. This coal comes from more than 100.000 ha of forest planted by Vallourec Florestal Ltda.. With the acquisition of 4,6 ton(s) os steel tubes from Vallourec do Brasil S.A., your company contributed to the reduction of the greenhouse effect, avoiding the accumulation of 8,3 ton(s) of Carbon Dioxide CO2 in the atmosphere.

Benteler Steel/Tube GmbH
Postfach 13 40
33043 Paderborn
Deutschland
Tel.: + 49.5254.81-0 Fax: + 49.5254.13666

BENTELER
Steel/Tube

ABNAHMEPRÜFZEUGNIS EN 10204-3.1

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

Benteler Steel/Tube GmbH - Postfach 1340 - 33043 Paderborn - Deutschland

CCTF Corporation
Unit 2 4151 North Service Road
BURLINGTON, ON ON L7L 4X6
CANADA

Dokument-Nr.: 65-1069887/001/E
Document No.:
No. du document:

Prüf-Nr.:
Inspection No.:
No. du certificat:

Blatt: 1 / 6
Page:
Page:

Kunden-Bestell-Nr.: 46005849 / CCTF 4038177-00
Purchase Order No.:
No. de commande du client:

Hersteller: Warmrohrwerk Dinslaken
Manufacturer: (DIN EN ISO 9001, ISO/TS-16949 CERTIFIED BY TUEV NORD CERT)
Producteur: (PED 2014/68/EU CERTIFIED BY TUEV NORD SYSTEMS)

Benteler Auftrags-Nr.: 1646606
Benteler Order No.:
No. de commande Benteler:

Herstellerzeichen:
Manufacturer's brand:
Marque du producteur:

Versandanzeigen-Nr.: 6591130
Dispatch Note No.:
No. d'avis d'expédition:

Stempel des Abnahmebeauftragten: WA
Stamp of the inspection representative:
Poinçon du contrôleur:

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

Stahlerschmelzungsverfahren: ELEKTROSTAHL
Steelmaking process: ELECTRIC FURNACE
Procédé d'élaboration de l'acier: FOUR ELECTRIQUE

Lieferbedingungen: **Terms of delivery:** Conditions de livraison:	ASTM-A 106-2015, ASTM-A 333-2016-HF, ASME SA-106, ASME BPVC.II.A-2017, ASME SA-333-HF, ASME BPVC.II.A-2017, CSA Standard Z245.1-14 Category II, Sour Service, ANSI/NACE MR0175/ISO 15156-1: 2015, ANSI/NACE MR0175/ISO 15156-2: 2015
Maße - Toleranzen: **Dimensions-tolerances:** Dimensions-tolérances:	ASME SA-106, ASME BPVC.II.A-2017, ASTM-A 106-2015, ASME SA-999 ASME BPVC.II.A-2017, ASTM-A 999-2016
Stahlsorte: **Steel grade:** Nuance d'acier:	GRADE 1, GRADE 290, GRADE 6, GRADE B
Lieferzustand: **Delivery condition:** État de livraison:	Normalized
Produktkennzeichnung: **Product marking:** Marquage du produit:	FS: BENTELER Z.245.1 - 14 - A / SA-106 / A / SA-333 B/1/6/290 CATEGORIE 2 SS HEAT-NO. LT 50 SMLS HN DIMENSION TEST PRESSURE S6 WA GERMANY PO 4038177-00 / 2530090 DIMENSIONS SCHEDULE PS: HEAT-NO. DIMENSIONS SCHEDULE B/1/6/290 SS

AEZ = Ätztintenbeschriftung, Etching ink marking, Gravure à l'encre . FK = Farbkennzeichnung, color marking, marquage par couleur . FS = Farbschablonierung, paint stenciling, marquage par peinture . FSD = Farbstrahldrucker, Color jet printer, Imprimante à jet d'encre de couleur . LK = Laserkennzeichnung, Laser marking, Marquage laser . PKE = Etikettenkennzeichnung, tag marking, marquage sur étiquette . PS = Prägestempel, die stamp, marquage par poinçonnage . TS = Tintenstrahlkennzeichnung, Ink jet spray marking, Imprimante à jet d'encre

Benteler Steel/Tube GmbH
Postfach 13 40
33043 Paderborn
Deutschland
Tel.: + 49.5254.81-0 Fax: + 49.5254.13666

BENTELER
Steel/Tube

ABNAHMEPRÜFZEUGNIS EN 10204-3.1

INSPECTION CERTIFICATE EN 10204-3.1
CERTIFICAT DE RECEPTION EN 10204-3.1

Dokument-Nr.: / **Document No.:** / No. du document: 65-1069887/001/E

Prüf-Nr.: / **Inspection No.:** / No. du certificat:

Blatt: / **Page:** / Page: 2 / 6

Pos. / **Item** / Poste	Stück / **Number** / Nombre	Maße / **Dimensions** / Dimensions		Gesamtlänge / **Length total** / Longueur totale	Gewicht / **Weight** / Poids	Schmelzen-Nr. / **Heat No.** / No. de coulée	Prüfdruck / **Test pressure** / Pression d'épreuve		Rohr-Nr.-Gruppe / **Tube number group** / Série de no. des tubes	Vielfachlängen / **Multiple lengths** / Longueurs multiples
			feet	feet	lbs		PSI	s		
0002	72	4" NPS * Sched. 40 20 FT - 22 FT	2530090	1570,90	17284	610879	2650	5		

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

Pos. / **Item** / Poste	Schmelzen-Nr. / **Heat No.** / No. de coulée	C	SI	MN	P	S	CR	MO	NI	CU	V	NB	TI	B
0002	610879	0,130	0,320	1,25	0,008	0,001	0,14	0,06	0,25	0,11	0,062	0,014	0,003	0,0003

1. Formel: CE IIW= C+ (Mn/6)+ ((Cr+ Mo+ V)/5)+ ((Cu+ Ni)/15)< = 0,42 %
2. Formel: CEV= C+ F* ((Mn/6)+ (Si/24)+ (Cu/15)+ (Ni/20)+ ((Cr+ Mo+ V+ Nb)/5) + (5* B)) < = 0,40 %
3. Formel: Mn / C > = 3 / 1
4. Formel: Cr+ Cu+ Mo+ Ni+ V< = 1,00 %

Formelergebnisse / **Formula results** / Résultats des formules

Pos. / **Item** / Poste	Schmelzen-Nr / **Heat No.** / No. de coulée	1. Formel / **1.** / 1.	2. Formel / **2.** / 2.	3. Formel / **3.** / 3.	4. Formel / **4.** / 4.
0002	610879	0,415	0,369	9,615	0,622

Produktanalyse [%] / **Product analysis [%]** / Analyse sur produit [%]

Pos. / **Item** / Poste	Schmelzen-Nr. / **Heat No.** / No. de coulée	C	SI	MN	P	S	CR	MO	NI	CU	V	NB	TI	B
0002	610879	0,130	0,320	1,21	0,004	0,003	0,15	0,06	0,26	0,09	0,067	0,017	0,005	0,0004

1. Formel: CE IIW= C+ (Mn/6)+ ((Cr+ Mo+ V)/5)+ ((Cu+ Ni)/15)< = 0,42 %
2. Formel: CEV= C+ F* ((Mn/6)+ (Si/24)+ (Cu/15)+ (Ni/20)+ ((Cr+ Mo+ V+ Nb)/5) + (5* B)) < = 0,40 %
3. Formel: Mn / C > = 3 / 1
4. Formel: Cr+ Cu+ Mo+ Ni+ V< = 1,00 %

Benteler Steel/Tube GmbH
Postfach 13 40
33043 Paderborn
Deutschland
Tel.: + 49.5254.81-0 Fax: + 49.5254.13666

BENTELER
Steel/Tube

ABNAHMEPRÜFZEUGNIS EN 10204-3.1
INSPECTION CERTIFICATE EN 10204-3.1
CERTIFICAT DE RECEPTION EN 10204-3.1

Dokument-Nr.: 65-1069887/001/E
Document No.:
No. du document:

Prüf-Nr.:
Inspection No.:
No. du certificat:

Formelergebnisse / **Formula results** / Résultats des formules

Pos.	Schmelzen-Nr	1. Formel	2. Formel	3. Formel	4. Formel
Item	**Heat No.**	**1.**	**2.**	**3.**	**4.**
Poste	No. de coulée	1.	2.	3.	4.
0002	610879	0,410	0,366	9,308	0,627

Prüfergebnisse / **Test results** / Résultats des essais

Die Rohre sind auf Dichtheit geprüft durch: **The tubes have been submitted to a leak tightness test by:** Les tubes ont passé un contrôle d'étanchéité par:	Hydrostatic test: acc. to CSA Z245.1, holding time min 5 seconds, Test pressure/Time-record	PASSED
Die Rohre wurden zerstörungsfrei geprüft: **The tubes are non destructive tested:** Les tubes ont passé un essai non destructif:	ET-test: acc. to CSA Z245.1; for imperfections; drilled hole: 3,20 mm	PASSED

Augensichtkontrolle: **Visual inspection:** Examen visuel:	PASSED	Maßkontrolle: **Dimensions examination:** Vérification des dimensions:	PASSED	Ringfaltversuch: **Flattening test:** Essai d'aplatissement:	PASSED

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

Die Probennahme erfolgte an Vielfachlängen.
The sampling was carried out on multiple lengths.
L'echantillonage etait realise aux longueurs multiples.

Zugversuch längs bei RT, Streifenprobe / **Tensile test longitudinal at RT, Strip test specimen** / Essai de traction longitudinale à TA, Bande decoupee sur tube

Pos.	Proben-Nr.	Schmelzen-Nr.	Probenabmessung	Streckgrenze	Zugfestigkeit	Dehnung	
Item	**Specimen No.**	**Heat No.**	**Specimen dimensions**	**Yield strength**	**Tensile strength**	**Elongation**	
Poste	No. de l'éprouv.	No. de coulée	Dimensions de l'éprouv.	Limite élastique	Résistance à la traction	Allongement	
Anforderungen				RT 0,5 %	Rm	A2"	1. Formel
Requirements			mm	PSI	PSI	%	**1. Formula**
Exigences				42206-71794	60046-90504	MIN 32.00	1. Formule
0002	000001	610879	25,40 X 5,80	59175	77740	32,00	
0002	000002	610879	25,40 X 6,10	58305	78320	32,00	
0002	000003	610879	25,40 X 6,20	58885	77305	32,00	
0002	000004	610879	25,40 X 6,20	59466	79336	34,00	

Benteler Steel/Tube GmbH
Postfach 13 40
33043 Paderborn
Deutschland
Tel.: + 49.5254.81-0 Fax: + 49.5254.13666

BENTELER
Steel/Tube

ABNAHMEPRÜFZEUGNIS EN 10204-3.1

INSPECTION CERTIFICATE EN 10204-3.1
CERTIFICAT DE RECEPTION EN 10204-3.1

Dokument-Nr.: **Document No.:** No. du document: 65-1069887/001/E
Prüf-Nr.: **Inspection No.:** No. du certificat:
Blatt: 4 / 6 **Page:** Page:

Härteprüfung / Hardness test / Essai de dureté

Pos. Item Poste	Proben-Nr. Specimen No. No. de l'éprouv.	Schmelzen-Nr. Heat No. No. de coulée	Härte Hardness Dureté				
Anforderungen Requirements Exigences			HRC	HB MAX 200	HV	HRB	HBW
0002	000001	610879		159			
0002	000002	610879		158			
0002	000003	610879		160			
0002	000004	610879		156			

Kerbschlagbiegeversuch Notched bar impact test / Essai de flexion par choc (résilience) [1 CHARPY_V]

Probenlage: längs (L); Prüftemperatur: -51 °F
Specimen position: longitudinal (L);Test temperature: -51 °F
Position de l'éprouvette: longitudinal (L);Température d'essai: -51 °F

Pos. Item Poste	Proben-Nr. Specimen No. No. de l'éprouv.	Schmelzen-Nr. Heat No. No. de coulée	Probenabmessung Specimen dimensions Dimensions de l'éprouvette			Kerbschlagarbeit Absorbed energy Energie absorbée		Kerbschlagzähigkeit Impact strength Résistance au choc		Verf.-Bruchanteil Shear fracture Rupture ductile		Laterale Breitung Lateral expansion Expansion latérai		Sprödbruchanteil Brittle Fracture Rupture Fragile	
Anforderungen Requirements Exigences			Länge Length Longueur	Breite Width Largeur	Höhe Height Hauteur	einzel single individuelle	mittel average moyenne	einzel single individuelle	mittel average moyenne	einzel single individuelle	mittel average moyenne	einzel single individuelle	mittel average moyenne	einzel single individuelle	mittel average moyenne
			mm 55	mm 5,00	mm 10,00	J MIN 014	J	J/cm²		%	%	mm	mm		
0002	000001	610879	55	5,00	10,00	88				70		2,20			
				5,00	10,00	89				70		2,10			
				5,00	10,00	85	87			70	70	2,00	2,10		

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Dokument-Nr.: 65-1069887/001/E
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No. du certificat:

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Kerbschlagbiegeversuch **Notched bar impact test** / Essai de flexion par choc (résilience) [2 CHARPY_V]

Probenlage: quer (Q); Prüftemperatur: -51 °F
Specimen position: transversal (Q);Test temperature: -51 °F
Position de l'éprouvette: transversal (Q);Température d'essai: -51 °F

Pos. Item Poste	Proben-Nr. Specimen No. No. de l'éprouv.	Schmelzen-Nr. Heat No. No. de coulée	Probenabmessung Specimen dimensions Dimensions de l'éprouvette			Kerbschlagarbeit Absorbed energy Energie absorbée		Kerbschlagzähigkeit Impact strength Résistance au choc		Verf.-Bruchanteil Shear fracture Rupture ductile		Laterale Breitung Lateral expansion Expansion latéral		Sprödbruchanteil Brittle Fracture Rupture Fragile	
Anforderungen Requirements Exigences			Länge Length Longueur	Breite Width Largeur	Höhe Height Hauteur	einzel single individuelle	mittel average moyenne	einzel single individuelle	mittel average moyenne	einzel single individuelle	mittel average moyenne	einzel single individuelle	mittel average moyenne	einzel single individuelle	mittel average moyenne
			mm	mm	mm	J	J	J/cm²		%	%	mm	mm		
			55	5,00	10,00	MIN 014	MIN 020			MIN 50	MIN 60				
0002	000001	610879	55	5,00	10,00	35				60		1,20			
				5,00	10,00	32				60		1,10			
				5,00	10,00	33	33			60	60	1,00	1,10		

Wärmebehandlung / **Heat treatment** / Traitement thermique

Normalizing temperature: 920°C, Holding time: 5 min., Cooling: Air

Restmagnetismus / **Demagnetize** / Démagnétiser

demagnetized tubes; 1 measurement per 4 hours on both tube ends Two readings 180°apart around the circumference. Average value max 3.0 Millitesla (24 A/cm), individual value max 3.5 Millitesla (28 A/cm)

Vermerk / **Remark** / Remarque

NACE Standard: Hardness acc. to NACE Standard MR0175 HRC max. 22., The material meets the requirements of NACE MR0103, Region 3, in accordance to Figure 1 and Appendix A.2, ANSI/NACE MR0175/ISO 15156-2:2015; Certificate remarks: fully killed fine grained steel, This is to confirm that the seamless linepipe supplied by BENTELER and verified to CSA Standard Z245.1-14 meets the requirement for micro hardness of max. 248 HV 500 gf., No weld repair has been carried out, Sour Service, The Material is Aluminium deoxydized and inclusion shape controlled with Calcium-Silicon treatment, It is the end user's responsibility to ensure that all environmental requirements as well as the requirements regarding engineering, construction and operation of facilities are fulfilled in the country of use. Fit for purpose of the parts as well as homologation is not the scope of this contract., Steelmaking: BENTELER Steel Mill Lingen

Grain size: acc. to ASTM-E 112; Grain size and finer: 6

Verkäufer(in) / **Sales Personnel** / Personne chargée : Mr Dyka, Tel.: 05254/81-4265-204265, Fax: 204229

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No. du certificat:

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Dinslaken, 13.04.2018, TEL.: 02064.623-5360 FAX: 02064.623-5390

Abnahmebeauftragter
Inspection representative
Contrôleur
i. A. Patrick Hanraths / LABACH

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

vallourec

Vallourec Soluções Tubulares do Brasil S.A.
Barreiro Plant - Av. Olinto Meireles, 65
ZIP 30640-010 - Belo Horizonte, MG

EcoTube

RINA

Inspection Certificate

(According to DIN EN 10204 3.1)

N°.: 0030032296 / 00 Sheet: 1 / 4

Customer: VALLOUREC CANADA INC

Country: Canada

Material Number: 276430
Work Order: 536721 / 20
Customer Order: VM-4811/P.O.4038915-00

Inspection: Vallourec Soluções Tubulares do Brasil S.A.

PRODUCT: SEAMLESS STEEL PIPE, HOT FINISHED , BEVELED ENDS 30 DEG. , NORMALIZED
DIMENSIONS: 168,30 mm X 7,11 mm **GRADE:** GRADE 290 # GR I # 6 # B 6 STD 2530104
STANDARD: CSA-Z245.1-18 - CATEGORY II
IN ACCORDANCE ALSO TO THE STANDARDS: ASTM A 333M - 18 ASTM A 999M - 18 # ASTM A 106M - 18 ASTM A 530M - 18 # ASTM A 53M - 18 # ASME SA-333M - 17 ASME SA 999M - 17 # ASME SA-106M - 17 ASME SA 530M - 17
CUSTOMER SPECIFICATION: CCTF GrB,1,6,290 Cat II SS , 20.11.2017
SURFACE PROTECTION: EXTERNAL: LACQUER **PIPE ENDS PROTECTOR:** PLASTIC CAP
TOLERANCES: OUTSIDE DIAMETER (PIPE BODY): -0,80 mm / +1,26 mm **WALL THICKNESS:** -0,89 mm / +1,07 mm
TOLERANCES(PIPE ENDS): OUTSIDE DIAMETER: -0,40 mm / +1,60 mm
LENGTH: RANDOM 5486,00 mm - 6706,00 mm
STANDARD MARKING: PAINT STENCILED IN THE PIPE BODY: 536721/20 MANUFACTURER CSA-Z245.1-18 168,30 X 7,11 290 CAT II M46C SS S HN LENGTH HEAT NUMBER ASTM A/ASME SA 333, 1/6 HF SCH 040 LT -46C ASTM A/ASME SA 106 B 18400 KPA WEIGHT ASTM A 53 B VSB LOGO
SHIPPING MARKING: NPS 6" X SCH 40 NACE MR 0175/NACE MR 0103 - MADE IN BRAZIL * VM4811 / P.O # 4038915-00/ITEM-2 * TORONTO * CCTF

Heat	Pieces
175147	11
175724	24
178322	89
Total	**124**

THE PRODUCT IS SATISFACTORY IN THE FOLLOWING TESTS / INSPECTIONS: DIMENSIONAL # VISUAL # FLATTENING TEST # ENDS INSPECTION : UNTESTED ENDS CROPPED # HYDROSTATIC TEST: 18400,0 KPA 5 S # RESIDUAL MAGNETISM: MAX 30 GAUSS # ELECTROMAGNETIC TEST : CSAZ245.1-N10,LON/TRAN,OUT/INS # ULTRASONIC TEST FOR LAMINAR DEFECTS: ACC. CSA Z245.1-SOUR SERVICE #

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ISO 9001 ISO/TS 16949
ISO 14001 ISO 50001 OHSAS 18001

Inspection Certificate
(According to DIN EN 10204.3.1)
N°.: 0030032296 / 00

Chemical Composition (%)

Process: Basic Oxygen Furnace, heats fully killed

Ceq: CSA-Z245.1-CE11 — Ceq: C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15 — CE1: Cr + Cu + Mo + Ni + V

Heat	Control Lot		C	Mn	P	S	Si	Ni	Cr	Mo	Al	Cu	V	Nb	B	Ti	N	Ca	Ceq	Ceq	CE1
Heat Analisys		Min		0,400			0,100														
		Max	0,240	1,350	0,025	0,025	0,500	0,400	0,300	0,120		0,400	0,080	0,020	0,0010	0,110			0,400	0,430	1,000
Product Analisys		Min		0,400			0,100														
		Max	0,240	1,350	0,025	0,025	0,500	0,400	0,300	0,120		0,400	0,080	0,020	0,0010	0,110			0,400	0,430	1,000
175147	030003127653		0,12	1,31	0,010	0,007	0,30	0,01	0,04	0,01	0,027	0,025	0,004	0,016	0,0004	0,003	0,0055	0,0013	0,309	0,351	0,084
	Check 1		0,12	1,29	0,010	0,005	0,29	0,01	0,04	0,01	0,028	0,024	0,004	0,017	0,0002	0,003	0,0050	0,0011	0,309	0,348	0,088
	Check 2		0,12	1,29	0,010	0,006	0,28	0,01	0,04	0,01	0,027	0,023	0,004	0,016	0,0002	0,002	0,0050	0,0012	0,308	0,347	0,086
175724	030003127905		0,11	1,30	0,009	0,003	0,30	0,02	0,05	0,01	0,029	0,030	0,004	0,015	0,0004	0,002	0,0045	0,0015	0,284	0,347	0,115
	Check 1		0,11	1,31	0,009	0,002	0,29	0,02	0,05	0,01	0,031	0,029	0,004	0,016	0,0002	0,002	0,0050	0,0013	0,285	0,346	0,116
	Check 2		0,11	1,32	0,009	0,002	0,28	0,02	0,05	0,01	0,030	0,029	0,003	0,016	0,0002	0,002	0,0050	0,0013	0,287	0,346	0,115
178322	030003155671		0,10	1,28	0,012	0,003	0,29	0,04	0,06	0,02	0,028	0,080	0,004	0,016	0,0004	0,002	0,0071	0,0015	0,267	0,348	0,201
	Check 1		0,10	1,29	0,013	0,003	0,29	0,04	0,06	0,02	0,030	0,083	0,002	0,017	0,0002	0,002	0,0071	0,0014	0,269	0,350	0,197
	Check 2		0,10	1,27	0,011	0,004	0,30	0,04	0,06	0,02	0,029	0,082	0,004	0,015	0,0002	0,003	0,0075	0,0013	0,267	0,347	0,203

Ceq: Carbon Equivalent; Ceq: Carbon Equivalent; CE: Combined Elements;

Tensile Test

Specimen Direction: Longitudinal — **Temperature:** Room Temperature — **Wall Thickness:** 7,11 mm — **Gauge Length:** L0=2"

Method:Elong.Total Under Load 0,50 %

Heat	Control Lot	Type of Specimen	Area (MM2)	YS (MPA)	TS (MPA)	E (%)
	Required: Min			290	415	33
	Max				625	
175147	030003140032	STRIP WIDTH 25,4 MM	188,5	376	500	40
		STRIP WIDTH 25,4 MM	190,0	382	505	40
175724	030003127905	STRIP WIDTH 25,4 MM	188,8	371	486	39
		STRIP WIDTH 25,4 MM	186,2	369	500	39
	030003140031	STRIP WIDTH 25,4 MM	188,8	370	489	39
		STRIP WIDTH 25,4 MM	189,2	373	492	40
178322	030003155671	STRIP WIDTH 25,4 MM	186,5	355	488	39
		STRIP WIDTH 25,4 MM	185,9	360	492	40

YS-Yield Strength; TS-Tensile Strength; E-Elongation;

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RINA

Inspection Certificate
(According to DIN EN 10204.3.1)
N°.: 0030032296 / 00

Hardness Test

Scale: HV

		Max
	Required: Min	
	Max	246,0
Heat	Control Lot	
175147	030003140032	156,0 156,0
175724	030003127905	163,0 167,0
	030003140031	163,0 167,0
178322	030003155671	143,0 143,0

Impact Test

Test Specimen: CHARPY 10X55X5 V NOTCH — Direction: Longitudinal — Temperature: -53°C — Striker radius: 8 mm

		AE1 (J)	AE2 (J)	AE3 (J)	AE4 (J)	AE5 (J)	AE Avg (J)	SA1 (%)	SA2 (%)	SA3 (%)	SA4 (%)	SA5 (%)	SA Avg (%)	LE1 (Mils)	LE2 (Mils)	LE3 (Mils)	LE Avg (Mils)
	Required: Min	14	14	14			14	50	50	50			60				
	Max																
Heat	Control Lot																
175147	030003140032	122	123	123			123	100	100	100			100	64	64	65	67
175724	030003140031	122	122	122			122	100	100	100			100	64	64	67	67
178322	030003155671	144	142	151			146	100	100	100			100	79	79	66	75

AE - Absorbed Energy; SA - Shear Area; LE - Lateral Expansion;

Impact Test

Test Specimen: CHARPY V 10X55X5 FLATTENED — Direction: Transverse — Temperature: -46°C — Striker radius: 8 mm

		AE1 (J)	AE2 (J)	AE3 (J)	AE4 (J)	AE5 (J)	AE Avg (J)	SA1 (%)	SA2 (%)	SA3 (%)	SA4 (%)	SA5 (%)	SA Avg (%)	LE1 (Mils)	LE2 (Mils)	LE3 (Mils)	LE Avg (Mils)
	Required: Min	14	14	14			14	50	50	50			60				
	Max																
Heat	Control Lot																
175147	030003140032	121	121	122			121	100	100	100			100	53	58	59	64
175724	030003140031	121	122	121			122	100	100	100			100	55	60	55	68
178322	030003155671	106	111	104			106	100	100	100			100	76	80	72	76

AE - Absorbed Energy; SA - Shear Area; LE - Lateral Expansion;

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Inspection Certificate
(According to DIN EN 10204 3.1)
N°.: 0030032296 / 00 Sheet 4 / 4

Remarks:
1. MATERIAL IN ACCORDANCE WITH NACE MR 0175 PAR. 3.2/ISO 15156-2, ANNEX A.2.1.2/NACE MR0103 PAR.2.1. ALL LATEST EDITIONS

2. SKU 2530104

3. THE WORKS OPERATE A QUALITY MANAGEMENT SYSTEM ACCORDING TO EUROPEAN DIRECTIVE 2014/68/UE ANNEX I PAR. 4.3 (CERTIFICATE 2016 BH MP 02-03 VALID UNTIL 12.05 2019).

- MATERIAL ACCORDING TO PED 2014/68/UE ANNEX I PAR. 7.5

4. - NO WELD REPAIR
- FREE OF MERCURY CONTAMINATION
- NO RADIOACTIVE CONTAMINATION
- FINE GRAIN PRACTICE
- FULLY KILLED STEEL
- MATERIAL FROM BRAZIL

NORMALIZED
TEMPERATURE 892°C
SOAKING TIME 40 MINUTES
METHOD OF COOLING : AIR

We hereby certify that this product has been manufactured and examined in accordance with all requirements of the standards and specifications and all the results are found to be satisfactory. This testimonial and certificate respectively is recorded by a computer system and is valid without signature. Alteration or use for others products are regarded as falsification of documents and will be subject to criminal jurisdiction.

QUALITY CONTROL DEPARTMENT
FAX: (55-31) 3328-2773

e-mail:luiz.silva@vallourec.com

ENG. LUIZ FERNANDO DA SILVA - CREA/MG 58834-D
TECHNICAL RESPONSIBLE

DATE
02.27.2019

vallourec

Vallourec Soluções Tubulares do Brasil S.A
Barreiro Plant - Av. Olinto Meireles, 65
ZIP 30640-010 - Belo Horizonte, MG

EcoTube

RINA
ISO 9001 ISO/TS 16949
ISO 14001 ISO 50001 OHSAS 18001

Inspection Certificate
(According to DIN EN 10204 3.1)
N°.: 0030032296 / 00 Sheet:1 / 4

Customer: VALLOUREC CANADA INC

Country: Canada

Material Number: 276430
Work Order: 536721 / 20
Customer Order: VM-4811/P.O.4038915-00

Inspection: Vallourec Soluções Tubulares do Brasil S.A.

PRODUCT: SEAMLESS STEEL PIPE, HOT FINISHED , BEVELED ENDS 30 DEG. , NORMALIZED
DIMENSIONS: 168,30 mm X 7,11 mm **GRADE:** GRADE 290 # GR 1 # 6 # B 6 STD 2530104
STANDARD: CSA-Z245.1-18 - CATEGORY II
IN ACCORDANCE ALSO TO THE STANDARDS: ASTM A 333M - 18 ASTM A 999M - 18 # ASTM A 106M - 18 ASTM A 530M - 18 # ASTM A 53M - 18 # ASME SA-333M - 17 ASME SA 999M - 17 # ASME SA-106M - 17 ASME SA 530M - 17
CUSTOMER SPECIFICATION: CCTF GrB,1,6,290 Cat II SS , 20.11.2017
SURFACE PROTECTION: EXTERNAL: LACQUER **PIPE ENDS PROTECTOR:** PLASTIC CAP
TOLERANCES: OUTSIDE DIAMETER (PIPE BODY): -0,80 mm / +1,26 mm **WALL THICKNESS:** -0,89 mm / +1,07 mm
TOLERANCES(PIPE ENDS): OUTSIDE DIAMETER: -0,40 mm / +1,60 mm
LENGTH: RANDOM 5486,00 mm - 6706,00 mm
STANDARD MARKING: PAINT STENCILED IN THE PIPE BODY: 536721/20 MANUFACTURER CSA-Z245.1-18 168,30 X 7,11 290 CAT II M46C SS S HN LENGTH HEAT NUMBER ASTM A/ASME SA 333, 1/6 HF SCH 040 LT -46C ASTM A/ASME SA 106 B 18400 KPA WEIGHT ASTM A 53 B VSB LOGO
SHIPPING MARKING: NPS 6" X SCH 40 NACE MR 0175/NACE MR 0103 - MADE IN BRAZIL * VM4811 / P.O # 4038915-00/ITEM-2 * TORONTO * CCTF

Heat	Pieces
175147	11
175724	24
178322	89
Total	**124**

THE PRODUCT IS SATISFACTORY IN THE FOLLOWING TESTS / INSPECTIONS: DIMENSIONAL # VISUAL # FLATTENING TEST # ENDS INSPECTION : UNTESTED ENDS CROPPED # HYDROSTATIC TEST: 18400,0 KPA 5 S # RESIDUAL MAGNETISM: MAX 30 GAUSS # ELECTROMAGNETIC TEST : CSAZ245.1-N10,LON/TRAN,OUT/INS # ULTRASONIC TEST FOR LAMINAR DEFECTS: ACC. CSA Z245.1-SOUR SERVICE #

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RINA

Inspection Certificate
(According to DIN EN 10204.3.1)
N°.: 0030032296 / 00

Chemical Composition (%)

Process: Basic Oxygen Furnace, heats fully killed

Ceq: CSA-Z245.1-CE11 — Ceq: C+Mn/6+(Cr+Mo+V)/5 +(Ni+Cu)/15 — CE1: Cr + Cu + Mo + Ni + V

Heat	Control Lot	C	Mn	P	S	Si	Ni	Cr	Mo	Al	Cu	V	Nb	B	Ti	N	Ca	Ceq	Ceq	CE1
Heat Analisys	Min		0,400			0,100														
	Max	0,240	1,350	0,025	0,025	0,500	0,400	0,300	0,120		0,400	0,080	0,020	0,0010	0,110			0,400	0,430	1,000
Product Analisys	Min		0,400			0,100														
	Max	0,240	1,350	0,025	0,025	0,500	0,400	0,300	0,120		0,400	0,080	0,020	0,0010	0,110			0,400	0,430	1,000
175147	030003127653	0,12	1,31	0,010	0,007	0,30	0,01	0,04	0,01	0,027	0,025	0,004	0,016	0,0004	0,003	0,0055	0,0013	0,309	0,351	0,084
	Check 1	0,12	1,29	0,010	0,005	0,29	0,01	0,04	0,01	0,028	0,024	0,004	0,017	0,0002	0,003	0,0050	0,0011	0,309	0,348	0,088
	Check 2	0,12	1,29	0,010	0,006	0,28	0,01	0,04	0,01	0,027	0,023	0,004	0,016	0,0002	0,002	0,0050	0,0012	0,308	0,347	0,086
175724	030003127905	0,11	1,30	0,009	0,003	0,30	0,02	0,05	0,01	0,029	0,030	0,004	0,015	0,0004	0,002	0,0045	0,0015	0,284	0,347	0,115
	Check 1	0,11	1,31	0,009	0,002	0,29	0,02	0,05	0,01	0,031	0,029	0,004	0,016	0,0002	0,002	0,0050	0,0013	0,285	0,346	0,116
	Check 2	0,11	1,32	0,009	0,002	0,28	0,02	0,05	0,01	0,030	0,029	0,003	0,016	0,0002	0,002	0,0050	0,0013	0,287	0,346	0,115
178322	030003155671	0,10	1,28	0,012	0,003	0,29	0,04	0,06	0,02	0,028	0,080	0,004	0,016	0,0004	0,002	0,0071	0,0015	0,267	0,348	0,201
	Check 1	0,10	1,29	0,013	0,003	0,29	0,04	0,06	0,02	0,030	0,083	0,002	0,017	0,0002	0,002	0,0071	0,0014	0,269	0,350	0,197
	Check 2	0,10	1,27	0,011	0,004	0,30	0,04	0,06	0,02	0,029	0,082	0,004	0,015	0,0002	0,003	0,0075	0,0013	0,267	0,347	0,203

Ceq: Carbon Equivalent; Ceq: Carbon Equivalent; CE: Combined Elements;

Tensile Test

Specimen Direction: Longitudinal — **Temperature:** Room Temperature — **Wall Thickness:** 7,11 mm — **Gauge Length:** L0=2"

Method:Elong.Total Under Load 0,50 %

Heat	Control Lot	Type of Specimen	Area (MM2)	YS (MPA)	TS (MPA)	E (%)
	Required: Min			290	415	33
	Max				625	
175147	030003140032	STRIP WIDTH 25,4 MM	188,5	376	500	40
		STRIP WIDTH 25,4 MM	190,0	382	505	40
175724	030003127905	STRIP WIDTH 25,4 MM	188,8	371	486	39
		STRIP WIDTH 25,4 MM	186,2	369	500	39
	030003140031	STRIP WIDTH 25,4 MM	188,8	370	489	39
		STRIP WIDTH 25,4 MM	189,2	373	492	40
178322	030003155671	STRIP WIDTH 25,4 MM	186,5	355	488	39
		STRIP WIDTH 25,4 MM	185,9	360	492	40

YS-Yield Strength; TS-Tensile Strength; E-Elongation;

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Inspection Certificate
(According to DIN EN 10204.3.1)
N°.: 0030032296 / 00

Hardness Test

Scale: HV

		Min	Max
	Required: Min		
	Max	246,0	
Heat	Control Lot		
175147	030003140032	156,0	156,0
175724	030003127905	163,0	167,0
	030003140031	163,0	167,0
178322	030003155671	143,0	143,0

Impact Test

Test Specimen: CHARPY 10X55X5 V NOTCH — Direction: Longitudinal — Temperature: -53°C — Striker radius: 8 mm

		AE1 (J)	AE2 (J)	AE3 (J)	AE4 (J)	AE5 (J)	AE Avg (J)	SA1 (%)	SA2 (%)	SA3 (%)	SA4 (%)	SA5 (%)	SA Avg (%)	LE1 (Mils)	LE2 (Mils)	LE3 (Mils)	LE Avg (Mils)
	Required: Min	14	14	14			14	50	50	50			60				
	Max																
Heat	Control Lot																
175147	030003140032	122	123	123			123	100	100	100			100	64	64	65	67
175724	030003140031	122	122	122			122	100	100	100			100	64	64	67	67
178322	030003155671	144	142	151			146	100	100	100			100	79	79	66	75

AE - Absorbed Energy; SA - Shear Area; LE - Lateral Expansion;

Impact Test

Test Specimen: CHARPY V 10X55X5 FLATTENED — Direction: Transverse — Temperature: -46°C — Striker radius: 8 mm

		AE1 (J)	AE2 (J)	AE3 (J)	AE4 (J)	AE5 (J)	AE Avg (J)	SA1 (%)	SA2 (%)	SA3 (%)	SA4 (%)	SA5 (%)	SA Avg (%)	LE1 (Mils)	LE2 (Mils)	LE3 (Mils)	LE Avg (Mils)
	Required: Min	14	14	14			14	50	50	50			60				
	Max																
Heat	Control Lot																
175147	030003140032	121	121	122			121	100	100	100			100	53	58	59	64
175724	030003140031	121	122	121			122	100	100	100			100	55	60	55	68
178322	030003155671	106	111	104			106	100	100	100			100	76	80	72	76

AE - Absorbed Energy; SA - Shear Area; LE - Lateral Expansion;

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Inspection Certificate
(According to DIN EN 10204.3.1)
N°.: 0030032296 / 00 Sheet 4 / 4

Remarks:
1. MATERIAL IN ACCORDANCE WITH NACE MR 0175 PAR. 3.2/ISO 15156-2, ANNEX A.2.1.2/NACE MR0103 PAR.2.1 ALL LATEST EDITIONS

2. SKU 2530104

3. THE WORKS OPERATE A QUALITY MANAGEMENT SYSTEM ACCORDING TO EUROPEAN DIRECTIVE 2014/68/UE ANNEX I PAR. 4.3 (CERTIFICATE 2016 BH MP 02-03 VALID UNTIL 12.05.2019).

- MATERIAL ACCORDING TO PED 2014/68/UE ANNEX I PAR. 7.5

4. - NO WELD REPAIR
- FREE OF MERCURY CONTAMINATION
- NO RADIOACTIVE CONTAMINATION
- FINE GRAIN PRACTICE
- FULLY KILLED STEEL
- MATERIAL FROM BRAZIL

NORMALIZED
TEMPERATURE 892°C
SOAKING TIME 40 MINUTES
METHOD OF COOLING : AIR

We hereby certify that this product has been manufactured and examined in accordance with all requirements of the standards and specifications and all the results are found to be satisfactory. This testimonial and certificate respectively is recorded by a computer system and is valid without signature. Alteration or use for others products are regarded as falsification of documents and will be subject to criminal jurisdiction.

QUALITY CONTROL DEPARTMENT
FAX: (55-31) 3328-2773

e-mail:luiz.silva@vallourec.com

ENG. LUIZ FERNANDO DA SILVA - CREA/MG 58834-D
TECHNICAL RESPONSIBLE

DATE
02.27.2019

vallourec
Vallourec Soluções Tubulares do Brasil S.A.
Barreiro Plant - Av. Olinto Meireles, 65
ZIP 30640-010 - Belo Horizonte, MG

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RINA
ISO 9001 - ISO/TS 16949
ISO 14001 ISO 50001 OHSAS 18001

Inspection Certificate

(According to DIN EN 10204.3.1)

N°.: 0030030841 / 00 Sheet:1 / 4

Customer: VALLOUREC CANADA INC

Country: Canada

Material Number: 274465
Work Order: 531796 / 50
Customer Order: VM-4682 - P O 4038589-00

Inspection: Vallourec Soluções Tubulares do Brasil S.A.

PRODUCT: SEAMLESS STEEL PIPE, HOT FINISHED , BEVELED ENDS 30 DEG. , NORMALIZED
DIMENSIONS: 219,10 mm X 8,18 mm **SCHEDULE:** 040 **GRADE:** GRADE 290 # GR 1 # 6 # B 8 STD 2530112
STANDARD: CSA-Z245.1-14 - CATEGORY II
IN ACCORDANCE ALSO TO THE STANDARDS: ASTM A 333M - 16 ASTM A 999M - 18 # ASTM A 106M - 18 ASTM A 530M - 12 # ASTM A 53M - 12 # ASME SA-333M - 17 ASME SA 999M - 17 # ASME SA-106M - 17 ASME SA 530M - 17
CUSTOMER SPECIFICATION: CCTF GrB,1.6,290 Cat II SS , 20.11.2017
SURFACE PROTECTION: EXTERNAL: LACQUER **PIPE ENDS PROTECTOR:** PLASTIC CAP
TOLERANCES: OUTSIDE DIAMETER (PIPE BODY): -0,80 mm / +1,60 mm **WALL THICKNESS:** -1,02 mm / +1,23 mm
TOLERANCES(PIPE ENDS): OUTSIDE DIAMETER: -0,40 mm / +1,60 mm
LENGTH: RANDOM 5486,00 mm - 6706,00 mm
STANDARD MARKING: PAINT STENCILED IN THE PIPE BODY: 531796/50 MANUFACTURER CSA-Z245.1-14 219,10 X 8,18 290 CAT II SS S IIN LENGTH HEAT NUMBER ASTM A/ASME SA 333, 1/6 HF SCH 040 LT -46C ASTM A/ASME SA 106 B 16300 KPA WEIGHT ASTM A 53 B NPS 8" X SCH 40 VSB LOGO
SHIPPING MARKING: NACE MR 0175/NACE MR 0103 - MADE IN BRAZIL * VM4682 / P.O # 4038589-00/ITEM-5 * TORONTO * CCTF

Heat	Pieces
175141	6
175142	8
176433	28
Total	**42**

THE PRODUCT IS SATISFACTORY IN THE FOLLOWING TESTS / INSPECTIONS: DIMENSIONAL # VISUAL # FLATTENING TEST # ENDS INSPECTION : UNTESTED ENDS CROPPED # HYDROSTATIC TEST: 16300,0 KPA 5 S # RESIDUAL MAGNETISM: MAX 30 GAUSS # ELECTROMAGNETIC TEST : CSAZ245.1-N10,LON/TRAN,OUT/INS # ULTRASONIC TEST FOR LAMINAR DEFECTS: ACC. CSA Z245.1-SOUR SERVICE #

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Inspection Certificate
(According to DIN EN 10204.3.1)
N°.: 0030030841 / 00

Chemical Composition (%)

Process: Basic Oxygen Furnace, heats fully killed

Ceq: CSA-Z245.1-CE11 — Ceq: C+Mn/6+(Cr+Mo+V)/5 −(Ni+Cu)/15 — CE1: Cr + Cu + Mo + Ni + V

Heat	Control Lot		C	Mn	P	S	Si	Ni	Cr	Mo	Al	Cu	V	Nb	B	Ti	N	Ca	Ceq	Ceq	CE1
Heat Analisys		Min		0,400			0,100														
		Max	0,240	1,350	0,025	0,025	0,500	0,400	0,300	0,120		0,400	0,080	0,020	0,0010	0,110			0,400	0,430	1,000
Product Analisys		Min		0,400			0,100														
		Max	0,240	1,350	0,025	0,025	0,500	0,400	0,300	0,120		0,400	0,080	0,020	0,0010	0,110			0,400	0,430	1,000
175141	030003103023		0,10	1,28	0,009	0,003	0,27	0,02	0,05	0,01	0,026	0,028	0,001	0,016	0,0005	0,001	0,0070	0,0019	0,262	0,329	0,109
	Check 1		0,10	1,26	0,008	0,003	0,28	0,02	0,04	0,01	0,026	0,030	0,004	0,015	0,0003	0,001	0,0065	0,0016	0,258	0,324	0,104
	Check 2		0,11	1,28	0,008	0,002	0,28	0,02	0,04	0,01	0,026	0,031	0,004	0,016	0,0002	0,001	0,0065	0,0016	0,270	0,338	0,105
175142	030003103024		0,11	1,29	0,010	0,004	0,28	0,02	0,05	0,01	0,030	0,025	0,001	0,015	0,0004	0,002	0,0077	0,0016	0,283	0,340	0,106
	Check 1		0,11	1,28	0,011	0,003	0,28	0,03	0,06	0,01	0,031	0,021	0,005	0,016	0,0003	0,002	0,0072	0,0013	0,283	0,342	0,126
	Check 2		0,11	1,29	0,009	0,003	0,28	0,02	0,04	0,01	0,029	0,025	0,004	0,015	0,0003	0,002	0,0075	0,0014	0,281	0,339	0,099
176433	030003103452		0,10	1,27	0,012	0,004	0,28	0,03	0,06	0,01	0,029	0,070	0,004	0,015	0,0004	0,002	0,0099	0,0012	0,265	0,333	0,174
	Check 1		0,11	1,29	0,013	0,004	0,29	0,03	0,06	0,01	0,028	0,066	0,005	0,016	0,0003	0,002	0,0096	0,0013	0,277	0,346	0,171
	Check 2		0,11	1,26	0,013	0,004	0,28	0,03	0,06	0,01	0,028	0,066	0,005	0,016	0,0002	0,002	0,0096	0,0013	0,273	0,341	0,171

Ceq: Carbon Equivalent; Ceq: Carbon Equivalent; CE: Combined Elements;

Tensile Test

Specimen Direction: Longitudinal — **Temperature:** Room Temperature — **Wall Thickness:** 8,18 mm — **Gage Length:** L0=2"

Method:Elong.Total Under Load 0,50 %

Heat	Control Lot	Type of Specimen	Area (MM2)	YS (MPA)	TS (MPA)	E (%)
	Required: Min			290	415	35
	Max			495	625	
175141	030003103023	STRIP WIDTH 38,1 MM	336,8	360	472	41
		STRIP WIDTH 38,1 MM	348,7	389	455	40
175142	030003103024	STRIP WIDTH 38,1 MM	318,9	395	502	42
		STRIP WIDTH 38,1 MM	330,1	401	490	40
176433	030003103452	STRIP WIDTH 38,1 MM	328,0	396	508	43
		STRIP WIDTH 38,1 MM	341,8	410	495	40

YS-Yield Strength; TS-Tensile Strength; E-Elongation;

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Inspection Certificate
(According to DIN EN 10204.3.1)
N°.: 0030030841 / 00

Hardness Test

Scale: HV

		Max
	Required: Min	
	Max	246,0
Heat	Control Lot	
175141	030003103023	158,0 160,0
175142	030003103024	162,0 164,0
176433	030003103452	169,0 170,0

Impact Test

Test Specimen: CHARPY 10X55X7.5 V NOTCH — Direction: Longitudinal — Temperature: -46°C — Striker radius: 8 mm

		AE1 (J)	AE2 (J)	AE3 (J)	AE4 (J)	AE5 (J)	AE Avg (J)	SA1 (%)	SA2 (%)	SA3 (%)	SA4 (%)	SA5 (%)	SA Avg (%)	LE1 (Mils)	LE2 (Mils)	LE3 (Mils)	LE Avg (Mils)
	Required: Min	21	21	21			21	50	50	50			60				
	Max																
Heat	Control Lot																
175141	030003103023	267	264	261			264	100	100	100			100	75	75	75	75
175142	030003103024	270	267	255			264	100	100	100			100	80	80	80	80
176433	030003103452	245	235	245			242	100	100	100			100	80	80	80	80

AE - Absorbed Energy; SA - Shear Area; LE - Lateral Expansion;

Impact Test

Test Specimen: CHARPY 10X55X6.67 V NOTCH — Direction: Transverse — Temperature: -46°C — Striker radius: 8 mm

		AE1 (J)	AE2 (J)	AE3 (J)	AE4 (J)	AE5 (J)	AE Avg (J)	SA1 (%)	SA2 (%)	SA3 (%)	SA4 (%)	SA5 (%)	SA Avg (%)	LE1 (Mils)	LE2 (Mils)	LE3 (Mils)	LE Avg (Mils)
	Required: Min	18	18	18			18	50	50	50			60				
	Max																
Heat	Control Lot																
175141	030003103023	196	208	213			206	100	100	100			100	75	78	81	78
175142	030003103024	203	179	187			190	100	100	100			100	82	82	82	82
176433	030003103452	160	187	156			168	100	100	100			100	80	82	78	80

AE - Absorbed Energy; SA - Shear Area; LE - Lateral Expansion;

Remarks:

1. MATERIAL IN ACCORDANCE WITH NACE MR 0175
PAR. 3.2/ISO 15156-2, ANNEX A.2.1.2/NACE MR0103 PAR.2.1. ALL LATEST

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Inspection Certificate
(According to DIN EN 10204.3.1)
N°.: 0030030841 / 00 Sheet 4 / 4

EDITIONS

2. SKU 2530112

3. THE WORKS OPERATE A QUALITY MANAGEMENT SYSTEM ACCORDING TO EUROPEAN DIRECTIVE 2014/68/UE ANNEX I PAR. 4.3 (CERTIFICATE 2016 BH MP 02-03 VALID UNTIL 12.05.2019).
- MATERIAL ACCORDING TO PED 2014/68/UE ANNEX I PAR. 7.5

"STEEL MADE BY BOF PROCESS"

4. - NO WELD REPAIR
- FREE OF MERCURY CONTAMINATION
- NO RADIOACTIVE CONTAMINATION
- FINE GRAIN PRACTICE
- FULLY KILLED STEEL.
- MATERIAL FROM BRAZIL

We hereby certify that this product has been manufactured and examined in accordance with all requirements of the standards and specifications and all the results are found to be satisfactory. This testimonial and certificate respectively is recorded by a computer system and is valid without signature. Alteration or use for others products are regarded as falsification of documents and will be subject to criminal jurisdiction.

QUALITY CONTROL DEPARTMENT
FAX: (55-31) 3328-2773

e-mail:luis.silva@vallourec.com

ENG. LUIZ FERNANDO DA SILVA - CREA-MG 58834-D
TECHNICAL RESPONSIBLE

DATE
11.20.2018

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Vallourec Soluções Tubulares do Brasil S.A.
Barreiro Plant - Av. Olinto Meireles, 65
ZIP 30640-010 - Belo Horizonte, MG

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RINA

Inspection Certificate

(According to DIN EN 10204.3.1)

N°.: 0030031810 / 00 Sheet: 1 / 4

Customer: VALLOUREC CANADA INC

Country: Canada

Material Number: 276624
Work Order: 534782 / 80
Customer Order: VM-4748 - P.O 4038825-00

Inspection: Vallourec Soluções Tubulares do Brasil S.A.

PRODUCT: SEAMLESS STEEL PIPE, HOT FINISHED , BEVELED ENDS 30 DEG, , NORMALIZED
DIMENSIONS: 219,10 mm X 8,18 mm SCHEDULE: 040 GRADE: GRADE 290 # GR 1 # 6 # B 8 STD 2530112
STANDARD: CSA-Z245.1-18 - CATEGORY II
IN ACCORDANCE ALSO TO THE STANDARDS: ASTM A 333M - 16 ASTM A 999M - 18 # ASTM A 106M - 18 ASTM A 530M - 12 # ASTM A 53M - 12 # ASME SA-333M - 17 ASME SA 999M - 17 # ASME SA-106M - 17 ASME SA 530M - 17
CUSTOMER SPECIFICATION: CCTF GrB.1,6.290 Cat II SS , 20.11.2017
SURFACE PROTECTION: EXTERNAL: LACQUER PIPE ENDS PROTECTOR: PLASTIC CAP
TOLERANCES: OUTSIDE DIAMETER (PIPE BODY): -0,80 mm / +1,60 mm WALL THICKNESS: -1,02 mm / +1,23 mm
TOLERANCES(PIPE ENDS): OUTSIDE DIAMETER: -0,40 mm / +1,60 mm
LENGTH: RANDOM 5486,00 mm - 6706,00 mm
STANDARD MARKING: PAINT STENCILED IN THE PIPE BODY: 534782 80 MANUFACTURER CSA-Z245.1-18 219,10 X 8,18 290 CAT II M46C SS S HN LENGTH HEAT NUMBER ASTM A ASME SA 333, 1 6 HF SCH 040 LT -46C ASTM A/ASME SA 106 B 16300 KPA WEIGHT ASTM A 53 B NPS 8" X SCH 40 VSB LOGO
SHIPPING MARKING: NACE MR 0175/NACE MR 0103 - MADE IN BRAZIL * VM4748 / P.O # 4038825-00#ITEM-8 * TORONTO * CCTF

Heat	Pieces
175146	12
177833	26
Total	38

THE PRODUCT IS SATISFACTORY IN THE FOLLOWING TESTS / INSPECTIONS: DIMENSIONAL # VISUAL # FLATTENING TEST # ENDS INSPECTION ; UNTESTED ENDS CROPPED # HYDROSTATIC TEST 16300,0 KPA 5 S # RESIDUAL MAGNETISM: MAX 30 GAUSS # ELECTROMAGNETIC TEST : CSAZ245.1-N10,LONTRAN,OUTLINS # ULTRASONIC TEST FOR LAMINAR DEFECTS: ACC. CSA Z245.1-SOUR SERVICE #

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RINA

ISO 9001 ISO/TS 16949
ISO 14001 ISO 50001 OHSAS 18001

Inspection Certificate

(According to DIN EN 10204.3.1)

N°.: 0030031810 / 00

Chemical Composition (%)

Process: Basic Oxygen Furnace, heats fully killed

Ceq: CSA-Z245.1-CE11 — **Ceq:** C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15 — **CE1:** Cr + Cu + Mo + Ni + V

		C	Mn	P	S	Si	Ni	Cr	Mo	Al	Cu	V	Nb	B	Ti	N	Ca	Ceq	Ceq	CE1
Heat Analisys	Min		0,400			0,100														
	Max	0,240	1,350	0,025	0,025	0,500	0,400	0,300	0,120		0,400	0,080	0,020	0,0010	0,110			0,400	0,430	1,000
Product Analisys	Min		0,400			0,100														
	Max	0,240	1,350	0,025	0,025	0,500	0,400	0,300	0,120		0,400	0,080	0,020	0,0010	0,110			0,400	0,430	1,000
Heat	Control Lot																			
175146	030003113164	0,11	1,29	0,010	0,004	0,29	0,01	0,04	0,01	0,027	0,022	0,004	0,015	0,0004	0,002	0,0074	0,0012	0,281	0,338	0,086
	Check 1	0,11	1,29	0,010	0,005	0,30	0,01	0,05	0,01	0,028	0,022	0,005	0,015	0,0005	0,002	0,0077	0,0012	0,284	0,340	0,097
	Check 2	0,11	1,30	0,009	0,005	0,31	0,01	0,04	0,01	0,029	0,020	0,004	0,016	0,0002	0,002	0,0079	0,0014	0,283	0,339	0,084
177833	030003140903	0,11	1,29	0,010	0,004	0,28	0,03	0,07	0,01	0,029	0,090	0,004	0,014	0,0003	0,002	0,0067	0,0018	0,289	0,350	0,204
	Check 1	0,11	1,28	0,011	0,003	0,27	0,03	0,07	0,01	0,030	0,090	0,003	0,015	0,0002	0,002	0,0064	0,0018	0,287	0,348	0,203
	Check 2	0,10	1,28	0,011	0,003	0,27	0,03	0,07	0,01	0,030	0,090	0,003	0,015	0,0002	0,002	0,0067	0,0016	0,272	0,338	0,203

Ceq: Carbon Equivalent; Ceq: Carbon Equivalent; CE: Combined Elements;

Tensile Test

Specimen Direction: Longitudinal — **Temperature:** Room Temperature — **Wall Thickness:** 8,18 mm — **Gauge Length:** 1.0-2"

Method:Elong.Total Under Load 0,50 %

		Type of Specimen	Area (MM2)	YS (MPA)	TS (MPA)	E (%)
Required: Min				290	415	35
Max				495	625	
Heat	Control Lot					
175146	030003113164	STRIP WIDTH 38 MM	324,3	383	502	41
		STRIP WIDTH 38 MM	329,7	399	515	40
177833	030003140903	STRIP WIDTH 38,1 MM	305,2	420	519	42
		STRIP WIDTH 38,1 MM	300,7	425	525	40

YS-Yield Strength; TS-Tensile Strength; E-Elongation;

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RINA

Inspection Certificate
(According to DIN EN 10204.3.1)
N°.: 0030031810 / 00 Sheet: 3 4

Hardness Test

Scale: HV

		Min	Max
	Required: Min		
	Max	246,0	
Heat	Control Lot		
175146	030003113164	148,0	150,0
177833	030003140903	152,0	155,0

Impact Test

Test Specimen: CHARPY 10X55X7.5 V NOTCH — Direction: Longitudinal — Temperature: -46°C — Striker radius: 8 mm

		AE1 (J)	AE2 (J)	AE3 (J)	AE4 (J)	AE5 (J)	AE Avg (J)	SA1 (%)	SA2 (%)	SA3 (%)	SA4 (%)	SA5 (%)	SA Avg (%)	LE1 (Mils)	LE2 (Mils)	LE3 (Mils)	LE Avg (Mils)
	Required: Min	21	21	21			21	50	50	50			60				
	Max																
Heat	Control Lot																
175146	030003113164	270	275	262			269	100	100	100			100	78	81	80	80
177833	030003140903	275	263	270			269	100	100	100			100	71	79	69	73

AE - Absorbed Energy; SA - Shear Area; LE - Lateral Expansion;

Impact Test

Test Specimen: CHARPY 10X55X6.67 V NOTCH — Direction: Transverse — Temperature: -46°C — Striker radius: 8 mm

		AE1 (J)	AE2 (J)	AE3 (J)	AE4 (J)	AE5 (J)	AE Avg (J)	SA1 (%)	SA2 (%)	SA3 (%)	SA4 (%)	SA5 (%)	SA Avg (%)	LE1 (Mils)	LE2 (Mils)	LE3 (Mils)	LE Avg (Mils)
	Required: Min	18	18	18			18	50	50	50			60				
	Max																
Heat	Control Lot																
177833	030003140903	210	186	174			190	100	100	100			100	88	87	88	88

AE - Absorbed Energy; SA - Shear Area; LE - Lateral Expansion;

Remarks:
1. MATERIAL IN ACCORDANCE WITH NACE MR 0175
PAR. 3.2/ISO 15156-2, ANNEX A.2.1.2/NACE MR0103 PAR.2.1, ALL LATEST
EDITIONS

2. SKU 2530112

3. THE WORKS OPERATE A QUALITY MANAGEMENT SYSTEM ACCORDING TO EUROPEAN

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Inspection Certificate
(According to DIN EN 10204 3.1)
N°.: 0030031810 / 00 Sheet:4 4

DIRECTIVE 2014/68/UE ANNEX I PAR. 4.3 (CERTIFICATE 2016 BH MP 02-03
VALID UNTIL 12.05.2019).
- MATERIAL ACCORDING TO PED 2014/68/UE ANNEX I PAR. 7.5

4. - NO WELD REPAIR
- FREE OF MERCURY CONTAMINATION
- NO RADIOACTIVE CONTAMINATION
- FINE GRAIN PRACTICE
- FULLY KILLED STEEL
- MATERIAL FROM BRAZIL

We hereby certify that this product has been manufactured and examined in accordance with all requirements of the standards and specifications and all the results are found to be satisfactory. This testimonial and certificate respectively is recorded by a computer system and is valid without signature. Alteration or use for others products are regarded as falsification of documents and will be subject to criminal jurisdiction.

QUALITY CONTROL DEPARTMENT
FAX: (55-31) 3328-2773

e-mail:luiz.silva@vallourec.com

ENG. LUIZ FERNANDO DA SILVA - CREA-MG 58834-D
TECHNICAL RESPONSIBLE

DATE
01.22.2019

vallourec

Vallourec Soluções Tubulares do Brasil S.A.
Barreiro Plant - Av. Olinto Meireles, 65
ZIP 30640-010 - Belo Horizonte, MG

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RINA
ISO 9001 / ISO/TS 16949
ISO 14001 ISO 50001 OHSAS 18001
Certified Management Systems

Inspection Certificate

(According to DIN EN 10204.3.1)

N°.: 0030030841 / 00 Sheet: 1 / 4

Customer: VALLOUREC CANADA INC

Country: Canada

Material Number: 274465
Work Order: 531796 / 50
Customer Order: VM-4682 - P O 4038589-00

Inspection: Vallourec Soluções Tubulares do Brasil S.A.

PRODUCT: SEAMLESS STEEL PIPE, HOT FINISHED , BEVELED ENDS 30 DEG. , NORMALIZED
DIMENSIONS: 219,10 mm X 8,18 mm **SCHEDULE:** 040 **GRADE:** GRADE 290 # GR 1 # 6 # B 8 STD 2530112
STANDARD: CSA-Z245.1-14 - CATEGORY II
IN ACCORDANCE ALSO TO THE STANDARDS: ASTM A 333M - 16 ASTM A 999M - 18 # ASTM A 106M - 18 ASTM A 530M - 12 # ASTM A 53M - 12 # ASME SA-333M - 17 ASME SA 999M - 17 # ASME SA-106M - 17 ASME SA 530M - 17
CUSTOMER SPECIFICATION: CCTF GrB,1,6,290 Cat II SS , 20.11.2017
SURFACE PROTECTION: EXTERNAL: LACQUER **PIPE ENDS PROTECTOR:** PLASTIC CAP
TOLERANCES: OUTSIDE DIAMETER (PIPE BODY): -0,80 mm / +1,60 mm **WALL THICKNESS:** -1,02 mm / +1,23 mm
TOLERANCES(PIPE ENDS): OUTSIDE DIAMETER: -0,40 mm / +1,60 mm
LENGTH: RANDOM 5486,00 mm - 6706,00 mm
STANDARD MARKING: PAINT STENCILED IN THE PIPE BODY: 531796/50 MANUFACTURER CSA-Z245.1-14 219,10 X 8,18 290 CAT II SS S HN LENGTH HEAT NUMBER ASTM A/ASME SA 333, 1/6 HF SCH 040 LT -46C ASTM A/ASME SA 106 B 16300 KPA WEIGHT ASTM A 53 B NPS 8" X SCH 40 VSB LOGO
SHIPPING MARKING: NACE MR 0175/NACE MR 0103 - MADE IN BRAZIL * VM4682 / P.O # 4038589-00/ITEM-5 * TORONTO * CCTF

Heat	Pieces
175141	6
175142	8
176433	28
Total	**42**

THE PRODUCT IS SATISFACTORY IN THE FOLLOWING TESTS / INSPECTIONS: DIMENSIONAL # VISUAL # FLATTENING TEST # ENDS INSPECTION : UNTESTED ENDS CROPPED # HYDROSTATIC TEST: 16300,0 KPA 5 S # RESIDUAL MAGNETISM: MAX 30 GAUSS # ELECTROMAGNETIC TEST : CSAZ245.1-N10,LON/TRAN,OUT/INS # ULTRASONIC TEST FOR LAMINAR DEFECTS: ACC. CSA Z245.1-SOUR SERVICE #

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RINA

Inspection Certificate
(According to DIN EN 10204.3.1)
N°.: 0030030841 / 00

Chemical Composition (%)

Process: Basic Oxygen Furnace, heats fully killed

Ceq: CSA-Z245.1-CE11 — Ceq: C+Mn/6+(Cr+Mo+V)/5 -(Ni+Cu)/15 — CE1: Cr + Cu + Mo + Ni + V

Heat	Control Lot		C	Mn	P	S	Si	Ni	Cr	Mo	Al	Cu	V	Nb	B	Ti	N	Ca	Ceq	Ceq	CE1
Heat Analisys		Min		0,400			0,100														
		Max	0,240	1,350	0,025	0,025	0,500	0,400	0,300	0,120		0,400	0,080	0,020	0,0010	0,110			0,400	0,430	1,000
Product Analisys		Min		0,400			0,100														
		Max	0,240	1,350	0,025	0,025	0,500	0,400	0,300	0,120		0,400	0,080	0,020	0,0010	0,110			0,400	0,430	1,000
175141	030003103023		0,10	1,28	0,009	0,003	0,27	0,02	0,05	0,01	0,026	0,028	0,001	0,016	0,0005	0,001	0,0070	0,0019	0,262	0,329	0,109
	Check 1		0,10	1,26	0,008	0,003	0,28	0,02	0,04	0,01	0,026	0,030	0,004	0,015	0,0003	0,001	0,0065	0,0016	0,258	0,324	0,104
	Check 2		0,11	1,28	0,008	0,002	0,28	0,02	0,04	0,01	0,026	0,031	0,004	0,016	0,0002	0,001	0,0065	0,0016	0,270	0,338	0,105
175142	030003103024		0,11	1,29	0,010	0,004	0,28	0,02	0,05	0,01	0,030	0,025	0,001	0,015	0,0004	0,002	0,0077	0,0016	0,283	0,340	0,106
	Check 1		0,11	1,28	0,011	0,003	0,28	0,03	0,06	0,01	0,031	0,021	0,005	0,016	0,0003	0,002	0,0072	0,0013	0,283	0,342	0,126
	Check 2		0,11	1,29	0,009	0,003	0,28	0,02	0,04	0,01	0,029	0,025	0,004	0,015	0,0003	0,002	0,0075	0,0014	0,281	0,339	0,099
176433	030003103452		0,10	1,27	0,012	0,004	0,28	0,03	0,06	0,01	0,029	0,070	0,004	0,015	0,0004	0,002	0,0099	0,0012	0,265	0,333	0,174
	Check 1		0,11	1,29	0,013	0,004	0,29	0,03	0,06	0,01	0,028	0,066	0,005	0,016	0,0003	0,002	0,0096	0,0013	0,277	0,346	0,171
	Check 2		0,11	1,26	0,013	0,004	0,28	0,03	0,06	0,01	0,028	0,066	0,005	0,016	0,0002	0,002	0,0096	0,0013	0,273	0,341	0,171

Ceq: Carbon Equivalent; Ceq: Carbon Equivalent; CE: Combined Elements;

Tensile Test

Specimen Direction: Longitudinal — **Temperature:** Room Temperature — **Wall Thickness:** 8,18 mm — **Gage Length:** L0=2"

Method:Elong.Total Under Load 0,50 %

Heat	Control Lot	Type of Specimen	Area (MM2)	YS (MPA)	TS (MPA)	E (%)
	Required: Min			290	415	35
	Max			495	625	
175141	030003103023	STRIP WIDTH 38,1 MM	336,8	360	472	41
		STRIP WIDTH 38,1 MM	348,7	389	455	40
175142	030003103024	STRIP WIDTH 38,1 MM	318,9	395	502	42
		STRIP WIDTH 38,1 MM	330,1	401	490	40
176433	030003103452	STRIP WIDTH 38,1 MM	328,0	396	508	43
		STRIP WIDTH 38,1 MM	341,8	410	495	40

YS-Yield Strength; TS-Tensile Strength; E-Elongation;

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Inspection Certificate
(According to DIN EN 10204.3.1)
N°.: 0030030841 / 00 Sheet: 3 / 4

Hardness Test

Scale: HV

		Max
Required: Min		
Max	246,0	
Heat	**Control Lot**	
175141	030003103023	158,0 160,0
175142	030003103024	162,0 164,0
176433	030003103452	169,0 170,0

Impact Test

Test Specimen: CHARPY 10X55X7.5 V NOTCH — Direction: Longitudinal — Temperature: -46°C — Striker radius: 8 mm

		AE1 (J)	AE2 (J)	AE3 (J)	AE4 (J)	AE5 (J)	AE Avg (J)	SA1 (%)	SA2 (%)	SA3 (%)	SA4 (%)	SA5 (%)	SA Avg (%)	LE1 (Mils)	LE2 (Mils)	LE3 (Mils)	LE Avg (Mils)
Required: Min		21	21	21			21	50	50	50			60				
Max																	
Heat	**Control Lot**																
175141	030003103023	267	264	261			264	100	100	100			100	75	75	75	75
175142	030003103024	270	267	255			264	100	100	100			100	80	80	80	80
176433	030003103452	245	235	245			242	100	100	100			100	80	80	80	80

AE - Absorbed Energy; SA - Shear Area; LE - Lateral Expansion;

Impact Test

Test Specimen: CHARPY 10X55X6.67 V NOTCH — Direction: Transverse — Temperature: -46°C — Striker radius: 8 mm

		AE1 (J)	AE2 (J)	AE3 (J)	AE4 (J)	AE5 (J)	AE Avg (J)	SA1 (%)	SA2 (%)	SA3 (%)	SA4 (%)	SA5 (%)	SA Avg (%)	LE1 (Mils)	LE2 (Mils)	LE3 (Mils)	LE Avg (Mils)
Required: Min		18	18	18			18	50	50	50			60				
Max																	
Heat	**Control Lot**																
175141	030003103023	196	208	213			206	100	100	100			100	75	78	81	78
175142	030003103024	203	179	187			190	100	100	100			100	82	82	82	82
176433	030003103452	160	187	156			168	100	100	100			100	80	82	78	80

AE - Absorbed Energy; SA - Shear Area; LE - Lateral Expansion;

Remarks:

1. MATERIAL IN ACCORDANCE WITH NACE MR 0175
PAR. 3.2/ISO 15156-2, ANNEX A.2.1.2/NACE MR0103 PAR.2.1. ALL LATEST

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Inspection Certificate
(According to DIN EN 10204.3.1)
N°.: 0030030841 / 00 Sheet 4 / 4

EDITIONS

2. SKU 2530112

3. THE WORKS OPERATE A QUALITY MANAGEMENT SYSTEM ACCORDING TO EUROPEAN DIRECTIVE 2014/68/UE ANNEX I PAR. 4.3 (CERTIFICATE 2016 BH MP 02-03 VALID UNTIL 12.05.2019).
- MATERIAL ACCORDING TO PED 2014/68/UE ANNEX I PAR. 7.5

"STEEL MADE BY BOF PROCESS"

4. - NO WELD REPAIR
- FREE OF MERCURY CONTAMINATION
- NO RADIOACTIVE CONTAMINATION
- FINE GRAIN PRACTICE
- FULLY KILLED STEEL
- MATERIAL FROM BRAZIL

We hereby certify that this product has been manufactured and examined in accordance with all requirements of the standards and specifications and all the results are found to be satisfactory. This testimonial and certificate respectively is recorded by a computer system and is valid without signature. Alteration or use for others products are regarded as falsification of documents and will be subject to criminal jurisdiction.

QUALITY CONTROL DEPARTMENT
FAX: (55-31) 3328-2773

e-mail:luis.silva@vallourec.com

ENG. LUIZ FERNANDO DA SILVA - CREA-MG 58834-D
TECHNICAL RESPONSIBLE

DATE
11.20.2018

vallourec
Vallourec Soluções Tubulares do Brasil S.A.
Barreiro Plant - Av. Olinto Meireles, 65
ZIP 306-40-010 - Belo Horizonte, MG

EcoTube

RINA
ISO 9001 - ISO/TS 16949
ISO 14001 - ISO 30000 - OHSAS 18001
Certified Management Systems

Inspection Certificate
(According to DIN EN 10204_3.1)
N°.: 0030031810 / 00 Sheet: 1 / 4

Customer: VALLOUREC CANADA INC

Country: Canada

Material Number: 276624
Work Order: 534782 / 80
Customer Order: VM-4748 - P.O 4038825-00

Inspection: Vallourec Soluções Tubulares do Brasil S.A.

PRODUCT: SEAMLESS STEEL PIPE, HOT FINISHED , BEVELED ENDS 30 DEG. , NORMALIZED
DIMENSIONS: 219,10 mm X 8,18 mm **SCHEDULE:** 040 **GRADE:** GRADE 290 # GR 1 # 6 # B 8 STD 2530112
STANDARD: CSA-Z245.1-18 - CATEGORY II
IN ACCORDANCE ALSO TO THE STANDARDS: ASTM A 333M - 16 ASTM A 999M - 18 # ASTM A 106M - 18 ASTM A 530M - 12 # ASTM A 53M - 12 # ASME SA-333M - 17 ASME SA 999M - 17 # ASME SA-106M - 17 ASME SA 530M - 17
CUSTOMER SPECIFICATION: CCTF GrB.1.6.290 Cat II SS - 20.11.2017
SURFACE PROTECTION: EXTERNAL: LACQUER **PIPE ENDS PROTECTOR:** PLASTIC CAP
TOLERANCES: OUTSIDE DIAMETER (PIPE BODY): -0,80 mm / +1,60 mm **WALL THICKNESS:** -1,02 mm / +1,23 mm
TOLERANCES(PIPE ENDS): OUTSIDE DIAMETER: -0,40 mm / +1,60 mm
LENGTH: RANDOM 5486,00 mm - 6706,00 mm
STANDARD MARKING: PAINT STENCILED IN THE PIPE BODY: 534782 80 MANUFACTURER CSA-Z245.1-18 219,10 X 8,18 290 CAT II M46C SS S HN LENGTH HEAT NUMBER ASTM A/ASME SA 333, 1 6 HF SCH 040 LT -46C ASTM A/ASME SA 106 B 16300 KPA WEIGHT ASTM A 53 B NPS 8" X SCH 40 VSB LOGO
SHIPPING MARKING: NACE MR 0175/NACE MR 0103 - MADE IN BRAZIL * VM4748 / P.O # 4038825-00/ITEM-8 * TORONTO * CCTF

Heat	Pieces
175146	12
177833	26
Total	38

THE PRODUCT IS SATISFACTORY IN THE FOLLOWING TESTS / INSPECTIONS: DIMENSIONAL # VISUAL # FLATTENING TEST # ENDS INSPECTION : UNTESTED ENDS CROPPED # HYDROSTATIC TEST 16300,0 KPA 5 S # RESIDUAL MAGNETISM: MAX 30 GAUSS # ELECTROMAGNETIC TEST : CSA/Z245.1-N10,LON/TRAN,OUT INS # ULTRASONIC TEST FOR LAMINAR DEFECTS: ACC. CSA Z245.1-SOUR SERVICE #

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RINA

Inspection Certificate
(According to DIN EN 10204.3.1)
N°.: 0030031810 / 00 Sheet:2 4

Chemical Composition (%)

Process: Basic Oxygen Furnace, heats fully killed

Ceq: CSA-Z245.1-CE11 Ceq: C+Mn/6+(Cr+Mo+V) 5 +(Ni+Cu) 15 CE1: Cr + Cu + Mo + Ni + V

		C	Mn	P	S	Si	Ni	Cr	Mo	Al	Cu	V	Nb	B	Ti	N	Ca	Ceq	Ceq	CE1
Heat Analisys	Min		0,400			0,100														
	Max	0,240	1,350	0,025	0,025	0,500	0,400	0,300	0,120		0,400	0,080	0,020	0,0010	0,110			0,400	0,430	1,000
Product Analisys	Min		0,400			0,100														
	Max	0,240	1,350	0,025	0,025	0,500	0,400	0,300	0,120		0,400	0,080	0,020	0,0010	0,110			0,400	0,430	1,000
Heat Control Lot																				
175146 030003113164		0,11	1,29	0,010	0,004	0,29	0,01	0,04	0,01	0,027	0,022	0,004	0,015	0,0004	0,002	0,0074	0,0012	0,281	0,338	0,086
Check 1		0,11	1,29	0,010	0,005	0,30	0,01	0,05	0,01	0,028	0,022	0,005	0,015	0,0005	0,002	0,0077	0,0012	0,284	0,340	0,097
Check 2		0,11	1,30	0,009	0,005	0,31	0,01	0,04	0,01	0,029	0,020	0,004	0,016	0,0002	0,002	0,0079	0,0014	0,283	0,339	0,084
177833 030003140903		0,11	1,29	0,010	0,004	0,28	0,03	0,07	0,01	0,029	0,090	0,004	0,014	0,0003	0,002	0,0067	0,0018	0,289	0,350	0,204
Check 1		0,11	1,28	0,011	0,003	0,27	0,03	0,07	0,01	0,030	0,090	0,003	0,015	0,0002	0,002	0,0064	0,0018	0,287	0,348	0,203
Check 2		0,10	1,28	0,011	0,003	0,27	0,03	0,07	0,01	0,030	0,090	0,003	0,015	0,0002	0,002	0,0067	0,0016	0,277	0,338	0,203

Ceq: Carbon Equivalent; Ceq: Carbon Equivalent; CE: Combined Elements;

Tensile Test

Specimen Direction: Longitudinal Temperature: Room Temperature Wall Thickness: 8.18 mm Gauge Length: 1.0 2"

Method:Elong.Total Under Load 0.50 "»

		Type of Specimen	Area (MM2)	YS (MPA)	TS (MPA)	E (%)
Required: Min				290	415	35
Max				495	625	
Heat Control Lot						
175146 030003113164		STRIP WIDTH 38 MM	324,3	383	502	41
		STRIP WIDTH 38 MM	329,7	399	515	40
177833 030003140903		STRIP WIDTH 38,1 MM	305,2	420	519	42
		STRIP WIDTH 38,1 MM	300,7	425	525	40

YS-Yield Strength; TS-Tensile Strength; E-Elongation;

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ISO 9001 · ISO/TS 16949 · ISO 14001 · ISO 50001 · OHSAS 18001

Inspection Certificate

(According to DIN EN 10204.3.1)

N°.: 0030031810 / 00 Sheet:3 -4

Hardness Test

Scale: HV

		Max	
	Required: Min		
	Max	246,0	
Heat	Control Lot		
175146	030003113164	148,0	150,0
177833	030003140903	152,0	155,0

Impact Test

Test Specimen: CHARPY 10X55X7.5 V NOTCH Direction: Longitudinal Temperature: -46°C Striker radius: 8 mm

		AE1 (J)	AE2 (J)	AE3 (J)	AE4 (J)	AE5 (J)	AE Avg (J)	SA1 (%)	SA2 (%)	SA3 (%)	SA4 (%)	SA5 (%)	SA Avg (%)	LE1 (Mils)	LE2 (Mils)	LE3 (Mils)	LE Avg (Mils)
	Required: Min	21	21	21			21	50	50	50			60				
	Max																
Heat	Control Lot																
175146	030003113164	270	275	262			269	100	100	100			100	78	81	80	80
177833	030003140903	275	263	270			269	100	100	100			100	71	79	69	73

AE - Absorbed Energy; SA - Shear Area; LE - Lateral Expansion;

Impact Test

Test Specimen: CHARPY 10X55X6.67 V NOTCH Direction: Transverse Temperature: -46°C Striker radius: 8 mm

		AE1 (J)	AE2 (J)	AE3 (J)	AE4 (J)	AE5 (J)	AE Avg (J)	SA1 (%)	SA2 (%)	SA3 (%)	SA4 (%)	SA5 (%)	SA Avg (%)	LE1 (Mils)	LE2 (Mils)	LE3 (Mils)	LE Avg (Mils)
	Required: Min	18	18	18			18	50	50	50			60				
	Max																
Heat	Control Lot																
177833	030003140903	210	186	174			190	100	100	100			100	88	87	88	88

AE - Absorbed Energy; SA - Shear Area; LE - Lateral Expansion;

Remarks:

1. MATERIAL IN ACCORDANCE WITH NACE MR 0175 PAR. 3.2/ISO 15156-2, ANNEX A.2.1.2/NACE MR0103 PAR.2.1. ALL LATEST EDITIONS

2. SKU 2530112

3. THE WORKS OPERATE A QUALITY MANAGEMENT SYSTEM ACCORDING TO EUROPEAN

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ISO 9001 ISO/TS 16949
ISO 14001 ISO 50001 OHSAS 18001

Inspection Certificate
(According to DIN EN 10204 3.1)
N°.: 0030031810 / 00 Sheet: 4 4

DIRECTIVE 2014/68/UE ANNEX I PAR. 4.3 (CERTIFICATE 2016 BH MP 02403
VALID UNTIL 12/05/2019).
- MATERIAL ACCORDING TO PED 2014/68/UE ANNEX I PAR. 7.5

4. - NO WELD REPAIR
- FREE OF MERCURY CONTAMINATION
- NO RADIOACTIVE CONTAMINATION
- FINE GRAIN PRACTICE
- FULLY KILLED STEEL
- MATERIAL FROM BRAZIL

We hereby certify that this product has been manufactured and examined in accordance with all requirements of the standards and specifications and all the results are found to be satisfactory. This testimonial and certificate respectively is recorded by a computer system and is valid without signature. Alteration or use for others products are regarded as falsification of documents and will be subject to criminal jurisdiction.

QUALITY CONTROL DEPARTMENT
FAX: (55-31) 3328-2773

e-mail:luiz.silva@vallourec.com

ENG. LUIZ FERNANDO DA SILVA - CREA MG 58834-D
TECHNICAL RESPONSIBLE

DATE
01.22.2019

MLTS_6059-18732
Heat# 61B1013 18.38332

CCTF CORPORATION

4151 North Service Road, Burlington, ON L7L 4X6 (905) 335-5320

Date: 6/11/2019

Mill Test Reports

Invoice: 1596643-01
PO: 2610087

Customer: 27403-261
EQUIPEMENT KN
POUR ABF MINES
8254 RANG DU VIEUX PONT
ROUYN-NORANDA, QC J9Y 0H4

Line	Heat#	Product	Description
3	61b01013 **	7561296	8 STD LR 45 WELD ELL A420WPL6
10	18/38332	7583949	8 300 RF WN FLG STD A350LF2

Heat codes followed by ** have been corrected, change may not show on the packing slip

PO#: 4039378 Seq: 3
WF 8 STD 45 L6 Part Description: Weld Fittings 8" (219.1mm O.D.) STD 45 DEG ELBOW A/SA420-WPL6
Heat#: 61B01013 Mill: BKL - Thai Benkan

Purchaser : _____

INSPECTION CERTIFICATE

TO EN10204 3.1

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

Purchase Order No. Job No.

D M Y Certificate No.
08/08/2018 T - 2018020878

E-No.	Specification for Material Made from Seamless Pipe	Specification for Inspection	Visual Examination	Dimensional Inspection
ME-567	A234-18/SA234-17 Gr.WPB/A420-16/SA420-17 Gr.WPL6 CSA Z245.11-17 GR.241 CAT II MSC 9S	ASME B16.9-2012,B16.25-2017	Good	Good

MFG. No.	Product & Size (T:*1)	Quantity	Hardness Actual Data
61B01013	7561296 45 EL WPB/WPL6 8 STD	50	HBW.123,126,129

	Material Heat No.	Chemical Composition%(Note1)	Boron (%)	
	J6K1189	Ti= 1	0.0001	

Specification	Chemical Composition %													*2 Tension Test transverse			HARDNESS MAX 197 HB : GOOD
	C	Si	Mn	P	S	Cu	Ni	Cr	Mo	Al	V	Nb	C.E.	YS	TS	E	Impact Test (J) longitudinal 10 X 6.7 X 2V AT -46 °C
	x 100	x 100	x 100	x 1000	x 1000	x 100	x 100	x 100	x 100	x 1000	x 1000	x 1000	x 100	MPa		%	
Min.		15	50											240	415	30	116
Max.	23	40	135	35	40	40	40	30	12		80	20	40		585		127 AVE. 111
	12	27	127	13	1	1	3	11	1		0	0	36	295	452	46	90

NORMALIZING 910 C X 40 MINUTES. COOLED IN STILL AIR

(Note 1) : Specification of Ti Composition (%) : Max 11 (Ti x 100) Material according to ANSI/NACE MR0175/ISO 15156-2-2015 Annex A & MR0103-2015 (SSC Region 3)

Fully killed and fine grain practiced *Steel making process : Basic Oxygen* Tensile test with longitudinal specimen and 50 mm. gauge length.

Rungnapa Kamphaeon
Quality Assurance Manager
Thai Benkan Co., Ltd.

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

COMPANY WITH MANAGEMENT SYSTEM CERTIFIED BY DNV GL = ISO 9001 = = ISO 14001 =	METALFAR PRODOTTI INDUSTRIALI SPA A01 23861 CESANA BRIANZA (LC) - ITALY VIA G. PARINI, 28 PHONE + 39 031 655441 - FAX +39 031 655149 certificate@metalfaritaly.com	COMPANY WITH MANAGEMENT SYSTEM CERTIFIED BY DNV GL = ISO 9001 = = ISO 14001 =

INSPECTION CERTIFICATE EN 10204:2004 / 3.1 A02 — Nr A03 2018-C_MFF-04299 — Data / Dated 31.10.2018 Z00

SILBO INDUSTRIES A06
50 CHESTNUT RIDGE ROAD SUITE 204
07645 MONTVALE N.J US

Ordine / PO	69051/BG A07
Item	015
DDT / Delivery note	2018-3E301-0004398
Packing List	2018-3E401-0004238
Fattura / Invoice	2018-3E401-0004238 A08
Ns. rif. / Our ref.	2017-3E201-0003478-0015

Dest. A05
CA

Cod. colata / Heat Code B07	Nr. colata / Heat Nr B07	Quantità / Quantity B06	Descrizione / Description B01 - (B06 - B11)
	18/38332	50,00	7583949 W/N 300 RF 8" STD LF2CL1

Mat. in acc. a / Mat. in acc. to B02
ASTM A 350M -18 ,ASME SA 350 M - 17 ,ASME CODE SECT. II, PART A, ED. 2017
ASTM A350 LF2 CL1
ASTM A105M - 18 , ASME SA105M-17 ASME CODE SECT. II, PART A, ED. 2017
NACE MR-0175/2015 ISO 15156 Part 2 _ Annex A - SOUR SERVICE
NACE MR-0103/2015 ISO 17495- SOUR SERVICE
CSA Z245.12-17 GRADE 248 CAT.II SOUR SERVICE
CSA Z245.12-17 GRADE 248 CAT.I SOUR SERVICE
Q.A.S.IN ACCORD.WITH PRESS.EQUIPM.DIRECT.2014/68/EU(PED) ANNEX I,PARAGRAPH 4.3
CERT 4687-2014-CE-ITA-DNV GL

Ann. mat. / Mat. remarks B02
FULLY KILLED STEEL AND FINE GRAIN PRACTICED
GRAIN SIZE : 7 OR FINER
NO WELD REPAIR

Elementi / Elements (C71 - C92)	C	Si	Mn	S	P	Cr	Ni	Mo	Ti	Cu	V	Nb	N
LADLE ANALYSIS	0,185	0,220	1,090	0,008	0,009	0,110	0,050	0,010	0,016	0,160	0,002	0,001	0,008
PRODUCT ANALYSIS	0,184	0,228	1,096	0,007	0,012	0,116	0,055	0,013	0,019	0,164	0,004	0,002	0,007
	Al	B	Ca						CE		F1	F2	PREN
LADLE ANALYSIS	0,025	0,0004	0,002						0,407		0,332	0,120	--
PRODUCT ANALYSIS	0,027	0,0000	0,002						0,408		0,352	0,129	--

CE=C+F(Mn/6+Si/24+Cu/15+Ni/20+(Cr+Mo+V+Nb)/5+5B) F1=Cu+Ni+Cr+Mo+V F2=Cr+Mo

Provetta / Test specimen Sez/Sect mm2	Gauge L.mm	Forma / Shape C10 1=O - 2=□	°C C23	Snervamento>0,2% / Yield Strength>0,2% C11 MPa	Snervamento>1,0% / Yield Strength>1,0% C11 MPa	Rottura / Tensile C12 MPa	Allungamento / Elongation C13 %	Contrazione / Reduction of area C15 %
126,60	50,80	1	20	335,0	--	530,0	37,0	69,0

DUREZZA / HARDNESS C22 HBW	Tipo/Type C40	Provetta / Test Specimen	°C C21	1-Joule C42	2-Joule C42	3-Joule C42	Media/Average C43
162,0 ; 166,0 ; 160,0	KV	10x10 mm	-46	57	60	50	55,7

Tratt. Term. / Heat treatment C70	NORMALIZED AT 930 °C - COOLED IN STILL AIR	GAS FURNACE
Dim in acc. a / Dim. acc. to B14	ASME/ANSI B16.5 -2017 ; ASME/ANSI B36.10M -2015 ; ASME/ANSI B16.25 -2017	
Finitura / Roughness	ASME/ANSI B46.1 -2009 125-250 u/in AARH	

Marcatura in acc. B06 / Marking in acc. to	ANSI/MSS SP-25-2018	Vis. & Dim.	SATISFACTORY	Origine / Origin of Steel	ITALY

Note / Notes 100% MANUFACTURED IN ITALY

Introduction of flanges on the furnace at temperature below 200°C
Heating of piece of 150°C every hour till 930°C
Holding time 1 hour/ Inch. - min 2 hours - Cooled in still air
Test specimen orientation : Longitudinal

UFFICIO CONTROLLO QUALITA' / QUALITY CONTROL DEPARTMENT A05	ENTE UFFICIALE DI COLLAUDO / INSPECTION AUTHORITY Z03	MARCHIO PRODUZIONE / MANUFACTURER'S SYMBOL A04
S. Frigeno		MFF

MLTS_6056-18732
Heat# SEE BELOW

CCTF CORPORATION

4151 North Service Road, Burlington, ON L7L 4X6 (905) 335-5320

Date: 6/14/2019

Mill Test Reports

Invoice: 1597082-00
PO: 2610096

Customer: 27403-261
A.B.F MINES/2985080
1310 AVE DAVY
REF 18777-6056
ROUYN NORANDA, QC J9Y 0A8

Line	Heat#	Product	Description
1	956v	7561733	8 STD WELD TEE A420WPL6
2	508105d	7586891	8 150 RF WN FLG STD A350LF2
3	508101C	7585666	8 300 RF BLIND FLG A350LF2
4	886v	7561288	6 STD LR 45 WELD ELL A420WPL6
5	18c1054	7561725	6 STD WELD TEE A420WPL6
6	508105g	7586832	6 150 RF WN FLG STD A350LF2
7	b03459	7585585	6 150 RF BLIND FLG A350LF2

Heat codes followed by ** have been corrected, change may not show on the packing slip

INSPECTION CERTIFICATE

Customer : CCTF CORPORATION
Product : SEAMLESS LOW TEMPERATURE CARBON STEEL BUTT WELD FITTINGS
Spec : ASTM A420-16/ASME SA420-15 WPL6, CSA Z245.11-17 Gr 241 Cat II -45C SS NACE MR0175/ISO 15156-2 Region 3-15 & NACE MR0103-16, ASTM A234-18/ASME SA234-15 WPB

ACCORDANCE WITH EN 10204-3.1
CHUP HSIN ENTERPRISE CO., LTD.
17, TUNG LI ROAD, HSIAO KANG DISTRICT,
KAOHSIUNG CITY, TAIWAN, R.O.C.
TEL:(07)831-9157 FAX:(07)821-7500, 831-2942

Certificate No : O0700020-0401
Order No : 4038285-00
Date : 2018/12/11

Raw Material	Specification for Inspection	Visual Inspection	Dimensional Inspection
ASTM A106 GR.B/GREEN PIPE FOR A333-6	ASME B16.9-2012	PASS	PASS

Item	Description		Quantity	Heat ID	Heat No	Raw Material Certificate No.	NDE MT	Impact Test: Test Temp ℃	Size of specimen mm	Charpy V.-Notch Impact Value J			Ave. J
3	90 E L/R WPL6 STD	3	100	A606	18321606	BAOSTEEL BGSAG1801240000400		-45	10 X 5.0 X 55	62	48	56	55.33
9	90 E L/R WPL6 XS	2	120	C023	18322023	BAOSTEEL BGSAG1804020007200		-45	10 X 5.0 X 55	48	40	52	46.67
10	90 E L/R WPL6 XS	8	5	A304	18323304	BAOSTEEL BGSAG1804250001100		-45	10 X 10 X 55	230	216	212	219.33
16	TEE WPL6 STD	8	5	956V	1535956V	HENGYANG C201538794-1	PASS	-45	10 X 7.5 X 55	46	52	48	48.67

7560109
7560873
7560926
7561733

Specification	Chemical Composition%												Tensile Test			Hardness Test	Heat Treatment	REMARK
	C	Si	Mn	P	S	Cu	Ni	Cr	Mo	V	Nb	C.E	Y.S	T.S	E			
	X100	X100	X100	X1000	X1000	X100	X100	X100	X100	X1000	X1000	X100	P.S.I	P.S.I	%	HB		
Min.		15	50										35000	60000	30			
Max.	30	40	135	35	40	40	40	30	12	80	20	50		95000		197		
3	13	17	78	10	3	4	2	4	1	<1	<1	27	42950	66700	39.0	133-134	NORM. 910℃x0.5HR AC	
9	12	16	80	7	6	2	1	3	1	<1	<1	26	41208	67300	35.0	133-134		
10	13	16	73	11	3	3	2	4	1	<1	20	26	44256	65300	44.0	134-135		
16	12	27	124	13	3	2	1	7	2	5	2	35	46722	67000	42.0	133-134		

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

We hereby certify that the material herein described has been manufactured, sampled, tested and inspected in accordance with, and was found to meet, the requirements of above specifications and purchaser's order.

K. Y. Tsai
Chief of Quality Assurance Section

CERTIFICATE OF INSPECTION & TEST (EN 10204 3.1)

ST&H CORPORATION
OFFICE - 74, Jwadongsunhwan-ro, Haeundae-gu, Busan, Korea
PLANT - 11, Eogokgongdan 2-gil, Yangsan-si, Kyungnam, Korea
Tel : +82.51.744-4680(5 line) Fax : +82.51.744-4670
E-mail :qm@stnhcorp.com

Certified to ISO9001/ ISO14001:2015,PED2014/68/EC by LRQA

Certificate No. MJH0165-02/07 **Date :** DEC. 20. 2018
Customer CCTF CORPORATION
Contract No. 4038829-00
Spec. For Material ASTM A105N-18,ASME SA105N-17,ASTM A350 LF2 CL1-18,ASME SA350 LF2 CL1-17,NACE MR0175/ISO 15156-2:2015,NACE MR0103/ISO 17495-1:2016
Heat Treatment 930°C NORMALIZED & A.C **Dimensional inspection**ASME B16.5 - 2017

ITEM / SIZE		Q'ty	Heat No./ Batch No.	Size of Test Specimen D mm	Size of Test Specimen GL mm		Tension Test Y.S MPa	Tension Test T.S MPa	Tension Test E.L %	Tension Test R.A %	Hardness Test (HB)		Charpy Impact Test (10X10mm Specimen Size) Indiv. 16J	Charpy Impact Test (10X10mm Specimen Size) Ave. 20J	Charpy Impact Test (10X10mm Specimen Size) Notch V	Charpy Impact Test (10X10mm Specimen Size) Temp. -46°C
						Max		655			187					
				12.5	50.0	Min	250	485	22.0	30.0			Test Result (J)			Ave.(J)
7586502	150LBS TH RF 6"	5	508105C	12.5	50.0		330	522	33	73	150	155	136	154	142	144
7581210	300LBS WN RF XH 6"	20	508105C	12.5	50.0		330	522	33	73	150	155	136	154	142	144
7586891	150LBS WN RF STD 8"	20	508105D	12.5	50.0		330	522	33	73	150	155	136	154	142	144
7586867	300LBS WN RF STD 4"	25	508105D	12.5	50.0		330	522	33	73	150	155	136	154	142	144
7585496	300LBS WN RF STD 6"	35	508105D	12.5	50.0		330	522	33	73	150	155	136	154	142	144
	BLANK		BLANK					BLANK			BLANK					

Heat No./ Batch No.		Chemical Composition (%) C	Si	Mn	P	S	Ni	Cr	Mo	Cu	V	Nb	CE	NDE UT	MT	PT
	Max	0.300	0.300	1.350	0.035	0.040	0.400	0.300	0.120	0.400	0.080	0.020				
	Min		0.150	0.600												
	H	0.159	0.234	1.260	0.011	0.003	0.019	0.077	0.005	0.017	0.001	0.004	0.388			
508105C	P	0.160	0.244	1.250	0.014	0.003	0.017	0.079	0.006	0.018	0.001	0.004	0.387			
	H	0.159	0.234	1.260	0.011	0.003	0.019	0.077	0.005	0.017	0.001	0.004	0.388			
508105D	P	0.160	0.244	1.250	0.014	0.003	0.017	0.079	0.006	0.018	0.001	0.004	0.387			
									BLANK							

REMARK * H : Heat Analysis P : Product Analysis

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

Witnessed by / H. J. LEE

Manager of Q.A Dept. / JAY KIM
ST&H CORPORATION

ST-801-14-02

CERTIFICATE OF INSPECTION & TEST (EN 10204 3.1)

ST&H CORPORATION
OFFICE - 74, Jwadongsunhwan-ro, Haeundae-gu, Busan, Korea
PLANT - 11, Eogokgongdan 2-gil, Yangsan-si, Kyungnam, Korea
Tel : +82.51.744-4680(5 line) Fax : +82.51.744-4670
E-mail :qm@stnhcorp.com

Certified to ISO9001/ ISO14001:2015,PED2014/68/EC by LRQA

Certificate No. MJH0137-07/11 **Date :** DEC. 19. 2018
Customer CCTF CORPORATION
Contract No. 4038743-00
Spec. For Material ASTM A10SN-18,ASME SA10SN-17,ASTM A350 LF2 CL1-18,ASME SA350 LF2 CL1-17,NACE MR0175/ISO 15156-2:2015,NACE MR0103/ISO 17495-1:2016
Heat Treatment 930°C NORMALIZED & A.C **Dimensional inspection**ASME B16.5 - 2017

ITEM / SIZE		Q'ty	Heat No./ Batch No.	Size of Test Specimen D mm	Size of Test Specimen GL mm	Tension Test	Y.S MPa	T.S MPa	E.L %	R.A %	Hardness Test (HB)		Charpy Impact Test (10X10mm Specimen Size) Indiv. 16J	Ave. 20J	Notch V	Temp. -46°C
						Max		655			187		Test Result (J)			Ave.(J)
				12.5	50.0	Min	250	485	22.0	30.0						
7585585	150LBS BL RF 6"	40	508101C	12.5	50.0		339	525	34	78	159	162	188	165	195	183
7585666	300LBS BL RF 8"	25	508101C	12.5	50.0		339	525	34	78	159	162	188	165	195	183
7580185	900/1500LBS SW RF S160 2"	20	508101C	12.5	50.0		339	525	34	78	159	162	188	165	195	183
7580219	150LBS SO RF 10"	20	508101F	12.5	50.0		339	525	34	78	159	162	188	165	195	183
7586507	150LBS SO RF 3"	50	508101F	12.5	50.0		339	525	34	78	159	162	188	165	195	183
7586508	150LBS SO RF 4"	25	508101F	12.5	50.0		339	525	34	78	159	162	188	165	195	183
7586509	150LBS SO RF 6"	70	508101F	12.5	50.0		339	525	34	78	159	162	188	165	195	183
7580218	150LBS SO RF 8"	25	508101F	12.5	50.0		339	525	34	78	159	162	188	165	195	183
	BLANK		BLANK					BLANK			BLANK					

Heat No./ Batch No.		Chemical Composition (%) C	Si	Mn	P	S	Ni	Cr	Mo	Cu	V	Nb						CE	NDE UT	MT	PT
	Max	0.300	0.300	1.350	0.035	0.040	0.400	0.300	0.120	0.400	0.080	0.020									
	Min		0.150	0.600																	
	H	0.160	0.207	1.250	0.009	0.007	0.020	0.091	0.002	0.024	0.001	0.004						0.390			
508101C	P	0.164	0.220	1.250	0.009	0.005	0.013	0.092	0.002	0.022	0.003	0.004						0.394			
	H	0.160	0.207	1.250	0.009	0.007	0.020	0.091	0.002	0.024	0.001	0.004						0.390			
508101F	P	0.164	0.220	1.250	0.009	0.005	0.013	0.092	0.002	0.022	0.003	0.004						0.394			
										BLANK											

REMARK * H : Heat Analysis P : Product Analysis

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

Witnessed by / H. J. LEE

Manager of Q.A Dept. / JAY KIM
ST&H CORPORATION

ST-801-14-02

INSPECTION CERTIFICATE

Customer : CCTF CORPORATION
Product : SEAMLESS LOW TEMPERATURE CARBON STEEL BUTT WELD FITTINGS
Spec : ASTM A420-16/ASME SA420-15 WPL6, CSA Z245.11-17 Gr 241 Cat II -45C SS NACE MR0175/ISO 15156-2 Region 3-15 & NACE MR0103-16, ASTM A234-18/ASME SA234-15 WPB

ACCORDANCE WITH EN 10204-3.1
CHUP HSIN ENTERPRISE CO., LTD.
17, TUNG LI ROAD, HSIAO KANG DISTRICT,
KAOHSIUNG CITY, TAIWAN, R.O.C.
TEL:(07)831-9157 FAX:(07)821-7500, 831-2942

Certificate No : 00700220-0110
Order No : 4039057-00
Date : 2019/03/19

Raw Material	Specification for Inspection	Visual Inspection	Dimensional Inspection
ASTM A106 GR.B/GREEN PIPE FOR A333-6	ASME B16.9-2012	PASS	PASS

Item	Description		Quantity	Heat ID	Heat No	Raw Material Certificate No.	NDE MT	Impact Test: Test Temp ℃	Size of specimen mm	Charpy V-Notch Impact Value J			Ave. J
123	45 E L/R WPL6 STD 1288	6	35	886V	1834886V	HENGYANG C201841289-1		-45	10 X 5.0 X 55	56	62	62	60
131	RED TEE WPL6 STD 2824	4 X 2	10	885V	1834885V	HENGYANG C201841281-1	PASS	-45	10 X 5.0 X 55	54	48	52	51.33
132	RED TEE WPL6 STD 2808	4 X 3	15	885V	1834885V	HENGYANG C201841281-1	PASS	-45	10 X 5.0 X 55	54	48	52	51.33
135	TEE WPL6 XS 1938	6	8	A248	18322248	BAOSTEEL BGSAG1803080005100	PASS	-45	10 X 10 X 55	128	142	150	140
136	TEE WPL6 XS 1946	8	2	E274	34274H	BAOSTEEL BGSQG1804040002900	PASS	-45	10 X 10 X 55	162	184	178	174.67

Specification	Chemical Composition%												Tensile Test			Hardness Test	Heat Treatment	REMARK
	C	Si	Mn	P	S	Cu	Ni	Cr	Mo	V	Nb	C.E	Y.S	T.S	E			
	X100	X100	X100	X1000	X1000	X100	X100	X100	X100	X1000	X1000	X100	P.S.I	P.S.I	%	HB		
Min.		15	50										35000	60000	30			
Max.	30	40	135	35	40	40	40	30	12	80	20	50		95000		197		
123	13	31	98	11	1	5	2	6	1	1	<1	31	49044	68100	42.5	135-138	NORM. 910 C x0.5HR AC	
131	13	31	100	11	2	5	2	6	2	<1	<1	31	47738	67600	37.0	138-139		
132	13	31	100	11	2	5	2	6	2	<1	<1	31	47738	67600	37.0	138-139		
135	13	15	74	6	4	4	2	4	1	<1	<1	27	39322	63600	40.0	138-139		
136	15	18	89	9	4	1	3	4	<1	<1	1	31	38306	68100	35.5	134-135		

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

We hereby certify that the material herein described has been manufactured, sampled, tested and inspected in accordance with, and was found to meet, the requirements of above specifications and purchaser's order.

K. Y. Tsai
Chief of Quality Assurance Section

INSPECTION CERTIFICATE

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

PURCHASER: SEYBOLD INT'L CORP.
STANDARD: ASTM A420 WPL6-16 / ASME SA420 WPL6-04 / CSA Z245.11-17 Gr.290 CAT II Sour Service
MATERIALS: ASTM A333-6
INSP SPEC: ASME B16.9 -12

DATE: 2019-01-07
ORDER NO: 7014596/4038286-00
P.I. NO: 18B05-1
CERTIFI. NO: 181212-1

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)
35	TEE 6"WPL6 STD 7561725	25	18C1054	GOOD	132-143	N	GOOD	10 x 5.0 x 2V AT -45 °C 112.4 115.3 129.7 119.1

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	Ti x100	B x1000	Y S KSI	T S KSI	E %	**	*CE x100	*CEQ x100
	STANDARD	MIN.		15	60											42.0	60.0	27.0			
		MAX.	30	50	160	50	60	150	100	25	25	13	100	2	1		95.0			50	50
35	J4LB254		11	26	130	14	3	1	2	12	1	<1	<1	2	<1	44.1	66.9	30.9	L	35	29

(NOTE): A:HOT FORMED WITH FINAL TEMPERATURE BETWEEN 620°C-980°C, AIR COOLING.
N:NORMALIZING AT TEMPERATURE 880°C X0.5HR, AIR COOLING S:STRESS RELIEF AT TEMPERATURE 650°C X0.5HR
NACE MR0175-2015/ISO15156-1 NACE MR0103-2015/ISO17945: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.

* TYPE OF SPECIMEN:STRIP(WIDTH:1 in./GAUGE LENGTH:2 in.) ** SAMPLING DIRECTION:L=LONGITUDINAL, T=TRANSVERSE
*CE=C+Mn/6+(Cr+Mo+V)/5+(Cu+Ni)/15 *CEQ=C+F(Mn/6+Si/24+Cu/15+Ni/20+(Cr+Mo+V+Nb)/5+5B)

Ou C Lan

MANAGER OF Q.A. DEPT.

CERTIFICATE OF INSPECTION & TEST (EN 10204 3.1)

ST&H CORPORATION
OFFICE - 74, Jwadongsunhwan-ro, Haeundae-gu, Busan, Korea
PLANT - 11, Eogokgongdan 2-gil, Yangsan-si, Kyungnam, Korea
Tel : +82.51.744-4680(5 line) Fax : +82.51.744-4670
E-mail :qm@stnhcorp.com

RPS 0150309 / 01

Certified to ISO9001/ ISO14001:2015,PED2014/68/EC by LRQA

Certificate No. MJH0165-03/07 **Date :** DEC. 20. 2018
Customer CCTF CORPORATION
Contract No. 4038829-00
Spec. For Material ASTM A105N-18,ASME SA105N-17,ASTM A350 LF2 CL1-18,ASME SA350 LF2 CL1-17,NACE MR0175/ISO 15156-2:2015,NACE MR0103/ISO 17495-1:2016
Heat Treatment 930℃ NORMALIZED & A.C **Dimensional inspection** ASME B16.5 - 2017

ITEM / SIZE		Q'ty	Heat No./ Batch No.	Size of Test Specimen		Tension Test					Hardness Test (HB)		Charpy Impact Test (10X10mm Specimen Size)			
				D	GL		Y.S	T.S	E.L	R.A			Indiv.	Ave.	Notch	Temp.
				mm	mm	Max	MPa	MPa	%	%	187		16J	20J	V	-46℃
				12.5	50.0	Min	250	485	22.0	30.0			Test Result (J)			Ave.(J)
7585860	150LBS BL RF 8"	5	508105E	12.5	50.0		330	522	33	73	150	155	136	154	142	144
7585640	300LBS BL RF 4"	10	508105E	12.5	50.0		330	522	33	73	150	155	136	154	142	144
7585658	300LBS BL RF 6"	10	508105E	12.5	50.0		330	522	33	73	150	155	136	154	142	144
7585666	300LBS BL RF 8"	5	508105E	12.5	50.0		330	522	33	73	150	155	136	154	142	144
7586832	150LBS WN RF STD 6"	50	508105G	12.5	50.0		330	522	33	73	150	155	136	154	142	144
	BLANK		BLANK					BLANK			BLANK					

Heat No./ Batch No.		Chemical Composition (%)																	NDE		
		C	Si	Mn	P	S	Ni	Cr	Mo	Cu	V	Nb						CE			
	Max	0.300	0.300	1.350	0.035	0.040	0.400	0.300	0.120	0.400	0.080	0.020							UT	MT	PT
	Min		0.150	0.600																	
	H	0.159	0.234	1.260	0.011	0.003	0.019	0.077	0.005	0.017	0.001	0.004						0.388			
508105E	P	0.160	0.244	1.250	0.014	0.003	0.017	0.079	0.006	0.018	0.001	0.004						0.387			
	H	0.159	0.234	1.260	0.011	0.003	0.019	0.077	0.005	0.017	0.001	0.004						0.388			
508105G	P	0.160	0.244	1.250	0.014	0.003	0.017	0.079	0.006	0.018	0.001	0.004						0.387			
										BLANK											

REMARK * H : Heat Analysis P : Product Analysis

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

Witnessed by / H. J. LEE

Manager of Q.A Dept. / JAY KIM
ST&H CORPORATION

ST-801-14-02

CERTIFICATE OF INSPECTION & TEST (EN 10204 3.1)

ST&H CORPORATION
OFFICE - 74, Jwadongsunhwan-ro, Haeundae-gu, Busan, Korea
PLANT - 11, Eogokgongdan 2-gil, Yangsan-si, Kyungnam, Korea
Tel : +82.51.744-4680(5 line) Fax : +82.51.744-4670
E-mail :qm@stnhcorp.com

Certified to ISO9001/ ISO14001:2015,PED2014/68/EC by LRQA

Certificate No. MJH0290-01/05 Date : FEB. 14. 2019
Customer CCTF CORPORATION
Contract No. 4039095-00
Spec. For Material ASTM A105N-18,ASME SA105N-17,ASTM A350 LF2 CL1-18,ASME SA350 LF2 CL1-17,NACE MR0175/ISO 15156-2:2015,NACE MR0103/ISO 17495-1:2016
Heat Treatment 930℃ NORMALIZED & A.C Dimensional inspectionASME B16.5 - 2017

ITEM / SIZE		Q'ty	Heat No./ Batch No.	Size of Test Specimen D mm	Size of Test Specimen GL mm	Tension Test	Y.S MPa	T.S MPa	E.L %	R.A %	Hardness Test (HB)		Charpy Impact Test (10X10mm Specimen Size) Indiv. 16J	Ave. 20J	Notch V	Temp. -46℃
						Max		655			187					
				12.5	50.0	Min	250	485	22.0	30.0			Test Result (J)			Ave.(J)
7585585	150LBS BL RF 6"	20	B03459	12.5	50.0		330	520	34	76	150	156	80	75	86	80
7585860	150LBS BL RF 8"	10	B03459	12.5	50.0		330	520	34	76	150	156	80	75	86	80
7580218	150LBS SO RF 8"	20	B03459	12.5	50.0		330	520	34	76	150	156	80	75	86	80
7580202	150LBS SO RF 14"	2	B03459	12.5	50.0		330	520	34	76	150	156	80	75	86	80
7586502	150LBS TH RF 6"	5	B03459	12.5	50.0		330	520	34	76	150	156	80	75	86	80
7586824	150LBS WN RF STD 4"	50	B03459	12.5	50.0		330	520	34	76	150	156	80	75	86	80
7586832	150LBS WN RF STD 6"	30	B03459	12.5	50.0		330	520	34	76	150	156	80	75	86	80
7586891	150LBS WN RF STD 8"	20	B03459	12.5	50.0		330	520	34	76	150	156	80	75	86	80
7583949	300LBS WN RF STD 8"	10	B03459	12.5	50.0		330	520	34	76	150	156	80	75	86	80
7585321	150LBS WN RF STD 10"	20	B03459	12.5	50.0		330	520	34	76	150	156	80	75	86	80

Heat No./ Batch No.		Chemical Composition (%) C	Si	Mn	P	S	Ni	Cr	Mo	Cu	V	Nb						CE	NDE UT	MT	PT
	Max	0.300	0.300	1.350	0.035	0.040	0.400	0.300	0.120	0.400	0.080	0.020									
	Min		0.150	0.600																	
	H	0.163	0.226	1.230	0.012	0.002	0.057	0.138	0.017	0.147	0.001	0.006						0.412			
B03459	P	0.162	0.224	1.240	0.011	0.002	0.054	0.136	0.014	0.138	0.001	0.001						0.411			

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REMARK * H : Heat Analysis P : Product Analysis

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

Witnessed by / H. J. LEE

Manager of Q.A Dept. / JAY KIM
ST&H CORPORATION

ST-801-14-02

MLTS_6056-18777
Heat# SEE BELOW

CCTF CORPORATION
5407 53rd Avenue, Edmonton, AB T6B 3G2 (780) 463-8700

Date: 6/14/2019

Mill Test Reports

Invoice: 5736215-00
PO: WT

Customer: 498
A.B.F. MINES/2985080 CANADA
1310 AVE DAVY
REF 18777-6056
ROUYN-NORANDA, QC J9Y 0A8

Line	Heat#	Product	Description
1	61k01m028	7561296	8 STD LR 45 WELD ELL A420WPL6
1	61m01m049	7561296	8 STD LR 45 WELD ELL A420WPL6
1	61n01m031-1	7561296	8 STD LR 45 WELD ELL A420WPL6
2	b21a8	7583949	8 300 RF WN FLG STD A350LF2

Heat codes followed by ** have been corrected, change may not show on the packing slip

Purchaser : CCTF CORPORATION

INSPECTION CERTIFICATE

TO EN10204 3.1

BENKAN

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

Purchase Order No. 4901180-00 | Job No.

D M Y Certificate No.
09/11/2018 T - 2018031531

E-No.	Specification for Material Made from Seamless Pipe	Specification for Inspection	Visual Examination	Dimensional Inspection
TA-162	ASTM A420-16 / ASME SA420-17 Gr.WPL6 CSA Z245.11-17 Gr.241 CAT II NHSC Sour Service	ASME B16.9-2012,B16.25-2017	Good	Good

MFG. No.	Product & Size (T:*1)	Quantity	Hardness Actual Data
61K01M028	45 EL WPL6 8 STD	10	HBW:115-145

	Material Heat No.	Item No.		
	184740	7561296		

Specification	Chemical Composition %													*2 Tension Test transverse			HARDNESS MAX 197 HB : GOOD	
	C	Si	Mn	P	S	Cu	Ni	Cr	Mo	Al	V	Nb	C.E.	YS	TS	E	Impact Test (J) longitudinal 10 X 6.7 X 2V AT -45 °C	
	X 100	X 100	X 100	X 1000	X 1000	X 100	X 100	X 100	X 100	X 1000	X 1000	X 1000	X 100	MPa.		%		
Min.		15	50											241	415	30	120	
Max.	30	35	135	35	40	40	40	30	12		80	20			585		129	AVE. 127
	15	21	105	9	5	6	4	5	2		1	1	35	305	481	41	131	

NORMALIZING 910 C X 40 MINUTES. COOLED IN STILL AIR

The product was manufactured,sampled,tested, and inspected as specified in this Standard and the purchase order, and was found to have met such requirements.

The material meet ANSI/NACE MR0175/ISO15156-2 (Region 3) :2015 & MR0103-2015

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 T7-61/1

Rungnapa Kampiranon
Quality Assurance Manager
Thai Benkan Co., Ltd.

Purchaser : CCTF CORPORATION

INSPECTION CERTIFICATE

TO EN10204 3.1

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

Purchase Order No. 4901220-00 | Job No.

D M Y Certificate No.
09/11/2018 T - 2018031547

E-No.	Specification for Material Made from Seamless Pipe	Specification for Inspection	Visual Examination	Dimensional Inspection
TA-169	ASTM A420-16 / ASME SA420-17 Gr.WPL6 CSA Z245.11-17 Gr.241 CAT II M45C Sour Service	ASME B16.9-2012,B16.25-2017	Good	Good

MFG. No.	Product & Size (T:*1)	Quantity	Hardness Actual Data
61M01M049	45 EL WPL6 8 STD	10	HBW:115-146

	Material Heat No.	Item No.		
	J8K4597	7561296		

Specification	Chemical Composition %													*2 Tension Test transverse			HARDNESS MAX 197 HB : GOOD	
	C	Si	Mn	P	S	Cu	Ni	Cr	Mo	Al	V	Nb	C.E.	Y S	T S	E	Impact Test (J) longitudinal	
	x 100	x 100	x 100	x 1000	x 1000	x 100	x 100	x 100	x 100	x 1000	x 1000	x 1000	x 100	MPa.		%	10 X 6.7 X 2V AT -46 °C	
Min.		15	50											241	415	30	161	
Max.	30	35	135	35	40	40	40	30	12		80	20			585		174	AVE. 173
	12	27	128	11	1	2	2	11	1		0	0	36	286	458	46	183	

NORMALIZING 910 C X 40 MINUTES. COOLED IN STILL AIR

The product was manufactured,sampled,tested, and inspected as specified in this Standard and the purchase order, and was found to have met such requirements.

The material meet ANSI/NACE MR0175/ISO15156-2 (Region 3) :2015 & MR0103-2015

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 T7-61/1

Rungnapa Kamptraroo
Quality Assurance Manager
Thai Benkan Co., Ltd.