



6120-C-265-001 MPEI QUALITY CONTROL REPORT



- 1. WELDING PROCEDURE SPECIFICATION (WPS)
- 2. WELDER QUALIFICATION TEST (WQT)
 - 2.1 Camirand, Sébastien
 - 2.2 Caouette, François
 - 2.3 St-Hilaire, Joel
- 3. PNEUMATIC PRESSURE TEST PROCEDURE.
- 4. PNEUMATIC PRESSURE TEST RESULTS.
- 5. MILLTEST & HEAT NUMBER DOCUMENTATION.
- 6. VALVE & EQUIPMENT CERTIFICATION



DESCRIPTION DE LA MÉTHODE DE SOUDAGE (DMS) WELDING PROCEDURE S PECIFICATION (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

ABF CONSTRUCTION

138, Chemin des Boisés

Val-d'Or, secteur Dubuisson,
Qc, J9P 4N7

Canada

Désignation de la Méthode
Provincial registration

DMS / WPS

SMAW-P1-P1
Révision: 0

RMS / PQR

SMAW-P1-P1-A

MTL 310.6

Procédé(s) de soudage / Welding process

		SMAW		Manuel Manual	х	Semi-automatique Semi-automatic	Machine-auto Auto.machine
			Joints /	Joints (QW-402)			
Genre / Design		nanfreiné, angle e, groove, fillet		→ ← D2		A2 A2 5	A1=30%°±2½° (VAISSEAU / VESSEL) A1=37½°±2½° (TUYAUTERIE / PIPING)
Caution / Backing	Oui / Yes	X		A1 (t A1	A1 _	↑	A2=20%°±2%° A3=10%°±2%° A4=45°±5%°
Soutien / Backing	Non / No	X	18 4			01 	D1 =1/16" ± 1/16"
Matériau de soutien Backing material	Option	Soudure ou P1 Weld or P1		D2		>=\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	D2=1/16" ± 1/16" (SANS BARRE DE SOUTIEN / WITHOUT BACKING)
Support de retenue Retainer	Aud	cun / None	A4/ 5	A1 A1 E		A1 A2 5	$D2$ =3/16" \pm 1/8" (AVEC BARRE DE SOUTIEN / WITH BACKING)
Autre / Other	Aud	cun / None	→ ← D2	D2 → ← ↑	_	D2 ×k	D3= 0" + 5/32"

Métaux de b	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)					
4 AVAIC NIE / NIC	E-6010 SF A: 5.1 F-No. 3 A-No. 1 Dia: 3/32"-1/8"-5/32"					
1 AWS N° / No	E-7018-1 SF A: 5.1 F-No. 4 A-No. 1 Dia: 3/32"-1/8"-5/32"-3/16"-1/					
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	n / 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

Préchauf	fage / Preheat (QW-406)	
Température de préchauffage, maintien du préchauffage (Optionel) Preheat temperature, preheat temperature (Optional).	T ≤ 1½ in.: 50° F Min. 1½ in. < T ≤ 2½ in.: 150° F Min.	2½ in. < T ≤ 4 in.: 250° F Min T > 4 in.: 300° F Min.
Température de l'interpasse / Enterpass temperature	50° F	TO COLOR OF THE PARTY OF THE PA
Autre / Other	Aucun	/ None

Traitement thermique postchauffage	I 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	3)
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

		Caractéristiqu	ues électrique et technique / Ele	ctrical, technical cha	racteristics (QW-409-Q	W-410)		
	Me	étal d'apport / Filler met	al		Coura	nt / Current		
Procédé Process	Diamètre Diameter	Classification Classification	Position de soudage Weld position	Type, polarité Type, polarity	Gamme d'ampèrage 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	I Pulse current					N/A		
	pe d'électrode d trode size and t					N/A		
Mode de trans	fert du métal / I	Mode of metal transf	er GMAW / FCAW / MCAW	Droit ou oscillant / String or wave, Largeur / Whidth: 3 x dia. Electrode				
Cordon droit o	u oscillant Stri	ng or weave bead						
Procédé de go	Procédé de gougeage arrière Method of back gouging			Meulage, scie,outil d'allésage / Grinding, saw, bit tool				
Nettoyage initi	al et entre les p	asses / Initial and in	terpass cleaning	de matière pou ciseau pneumati and all edges s	vant nuire à la qual que <i>l All surfaces w</i>	ité de la soudure; ithin one (1) inch I traces of lubrifia	d'huile, de peinture ou brossage, meulage, from the welding joint nts, cutting oils and ipping.	
Diamètre de la	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					
	Company of the Compan		ingle pass (per side)	Unique ou multiple / Single or multiple pass				
	•	Multiple or single e			Uniqu	e / Single		
Gamme de vite range	esse d'alimenta	tion de l'électrode /	Electrode wire feed speed			N/A		
Autre / Other	sutre / Other			Auci	un martelage permis	s / Peening is not	permitted	

Autres	commentaires / Supplementary Comments
 Essais de pliage guidés / Guided bend tests 	Voir rapport / See report 18C-088 1/3
Essais de traction / Tensile tests	Voir rapport / See report 18C-088 2/3
 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 qualififée 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

7000

Réservé au autorités / Departement use only

Vérifié par :

i certan Sy

0

Date: 0 3 AVR. 2018





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

ABF CONSTRUCTION		7777	nation de la Méthode cedure identification	Enregistrement provincial Provincial registration
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	MIL-310, 6

Procédé	(s) de soudage / Welding process			
SMAW	Manuel <i>Manual</i>	×	Semi-auto. Semi-auto.	Machine-auto Auto.machine

Métaux de base / Base metals (QW-403)		Joint / Joint (QW-402)		
SA-333 Gr. 6 à / to SA-350 LF2		0.337"		
Épaisseur / Thickness 0.337"		<u></u>		
Épaisseur de la couche la plus épaisse Thickness of the thicker pass 0.125"		± 3/32" \ \ \ ± 1/32" \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		
Autre / Other Aucun / None				

	Métaux d'apport / Filler metals (QW-404)				Positions / Positions (QW-405)			
Classe / Class AWS	SFA. No.	F-No	A-No	Épaisseur du dépot Weld thickness	Position du chanfrein Position of groove	6 G		
E 6011	5.1	3	1	0.125"	Progression de soudage Welding progression	Verticale montante / Vertical up		
E 7018	5.1	4	1	0.212"	Autre / Other	Aucun / None		

Préchauffage / Pre	heat (QW-406)	Traitement postchauffage/ Postweld heat treatment (QW-407)				
Température de préchauffage Preheat temperature	50° F	Gamme de température Temperature range	Aucun / None			
Température de l'interpasse Interpass temperature	50° F min.	Gamme de durée / Time range	·			
Autre / Other	Aucun / None	Autre / Other	Aucun / None			

Gaz / Gas (QV	V-408)	Technique / Techniq	que (QW-410)	
Composition du gaz de protection Shielding gas composition	Aucun / None	Cordon droit ou oscillant String or weave bead	Droit / String	
Débit de gaz / Gas flow rate	****	Oscillation / Osciillation	N/A	
Composition gaz soutien Backing gas composition	Aucun / None	Passe unique ou multiple (par côté) Multiple or single pass (per side)	Côté A Multiple / Multiple	
Débit de gaz / Gas flow rate		Électrode unique ou multiple	Unique / Single	
Autre / Other	Aucun / None	Multiple or single electrode	Sinque / Single	
		Autre / Other	Aucun / None	

		Caracté	ristiques élect	trique et techni	ques / Electr	ical and technical c	haracteristics (QW	-409-410)	
Couche Layer	Procédé Process	Classification Classification	Diamètre Diameter	Туре Туре	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"	CCIDC	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"	CCIDC	EP/RP	110	22	5,4 in/min.	26888 (J/in.)
5A	SMAW	E-7018-1	1/8"	CCIDC	EP/RP	110	22	5,4 in/min.	26888 (J/in.)

						Essais à la t						-			
Éprouvett Specimen		rgeur /idth	Épaiss Thickn		Surfa Area	2000	Charge u			nite de con timate unit		, N		roit de rup ocation of	pture Characte failure
1	0,7	56 in.	0,328	in.	0,2480	in ²	19375	lòs	781	35 PSI / 5	39 Mpa		Base	materia	al / Ductile
4	0,7	58 in.	0,335	in.	0,2539	in ²	19475	lbs	766	94 PSI / 5	29 Mpa		Base	materia	al / Ductile
					Es	sais de pliage	guidé / Guid	le bend test	(QW-160)						
Éprouv	ette / Specii	men		Face	/ Face		Racine /	Root		Côté / Si	de		F	Résultat /	Result
	2				x								Acc	epté / A	ccepted
	3						x						Acc	epté / A	ccepted
	5			-	×	i							Acc	epté / A	ccepted
	6						x						Acc	epté / A	ccepted
			===		E	ssais de rési	ience / Tougi	hness test (QW-170)						
Éprouvette Endroit de l'entaille Forme		Forme d	le l'entaille	Température d'éprouvette		Energie de rupture			Expansion Lateral exp					nute libre weigth	
Specimen	Notch lo	cation	Note	th type		n temperature	Impact value			illement lear	Millie			issé reak	Non cassé No break
1	Soudure	/ Weld		V		45°C	9:	5 J		60	8	1		√	
2	Soudure	/ Weld		v		45°C	36	6 J		10	3	2		1	
3	Soudure	/ Weld		v		45°C	89	9 J		50	7	1		√	
1	ZAT / HAZ	SA-333		V		45°C	87	7 J		70	7	4		√	
2	ZAT / HAZ	SA-333		V		45°C	89	J		60	7	5		√	
3	ZAT / HAZ	SA-333		V		45°C	49	J		50	4	3		√	
1	ZAT / HAZ	SA-350		V	-	45°C	12	4 J		35	7	7		√	
2	ZAT / HAZ	SA-350		V		45°C	11	9 J		35	8	0		√	
3	ZAT / HAZ	SA-350		V	-	45°C	15	3 J	1	00	8	4		√	
						Analyse o	himique / Ch	imical analy	sis						
C S	Si Mn	Ni	Cr	Nb I	P S		Cu Mo		V AL	. В	Co	W	Be	Pb	
						Non	requis / Not	required							

Non requis / Not required





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 i 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

Welded on:

Pièce soudée le: 6 MARS 2018

Inspecteur: Inspector:



Résultats vérifiés: Verified on:

0 3 AVR. 2018 Inspecteur:

Inspector:

RAPPORT / REPORT #:

18C-088

PAGE: 1 DE/C

DE/OF

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

16651-20155		IAW-P1	ов #: -P1 Rev.0	PROCE	DURE MEQUALTECH:	P4b-PLI	-06	Rev.	0
and the same of th				Section and	SENS DU P	LIAGE / BENI	D DIR	ECTION	
IDENTIFICATION	ACC.	REJ. DÉFAUT		DEFECT	RACINE / ROOT	FACE	CÔTÉ / SIDE		DE
PQR# SMAW-P1-P1 A									
Specimen #2	1					Х			
Specimen #3	V				X				
Specimen #5	7					X			
Specimen #6	~				X				
						X			
			MÉTHODE	/ METHOD)				

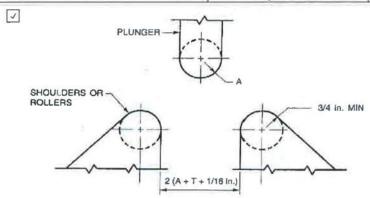
MÉTHODE / METHOD

Rayon de Mandrin / Mandrel rad. (A)

0,67 inch

ANGLE DE PLIAGE / BEND ANGLE

180°



T = SPECIMEN THICKNESS

T + 1/16 in.

MANDREL

A

CLAMP

ROLLER

WELD

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.

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ESSAIS EFFECTUÉS PAR / TESTS PERFORMED BY:

Pascal Morin, ing. Chef d

Chef de service

2018-03-16

TECHNICIEN / TECHNICIAN OPERATEUR / OPERATOR

QUALIFICATION

DATE

RAPPORT / REPORT #:

18C-088

3

PAGE: DE/OF

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# :
INSTRUMENT.	Tinius Olsen	Standard 60,000 Lbs	115,925

IDENTIFICATION ET RÉSULTATS / ÉCHANTILLON / SAMPLE IDENTIFICATION AND RESULTS ÉPROUVETTE / SAMPLE : #1 #4 DIAMÈTRE INITIALE / INITIAL DIAMETER (IN): LARGEUR INITIALE/ INITIAL WIDTH (IN) : 0.756 0.758 0,328 0,335 ÉPAISSEUR INITIALE / INITIAL THICKNESS (IN) : SURFACE INITIALE / INITIAL SURFACE (square inches): 0,2480 0,2539 CHARGE ULTIME / MAXIMUM LOAD (Ibs): 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.

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ESSAS EFFECTUES PAR / TESTS PERFORMED BY: Pascal Morin, ing. Chef de service 2018-03-16 TECHNICIEN / TECHNICIAN QUALIFICATION DATE OPERATEUR / OPERATOR





RAPPORT / REPORT #: 18C-088

PAGE: 3 DE/OF 3

	ESSAI DE RÉSILIE T TEST REPORT	NCE	CLIENT: ADRESSE / A	ADDRESS: 138 Val J9F	F CONSTRU	s Boisés	son), C)c
BON DE COMMANDE / P. 16651-20155	O. #: # DE CONTRA WPS# SMAW-F			E MEQUALTEC		ES-03	Rev.	0
INSTRUMENT:	MARQUE / TRA	DE MARK :	MODE	SI-1C3	#	DE SÉRIE / 162		# :
DESCRIPTION DE LA PIÈCE (DU PROCÉDÉS DE SOUDAG SMAW-P1-P1 A - Pipe			LDING PROCESS				
TEMPÉRATURE : -45°(RÉSULTATS/ RESI OU/OR JOU		FT./LBS	✓ JOULES	DIMENSIONS:	7 mm	X 10 m	ım
	ÉNERGIE ABSORBÉE / ABSORBED ENERGY		N LATÉRALE / PANSION(Mils)	% DE CISAIL		CASS	É / BREA	k
WELD		-						
	95	1	81	60)	7		
	36		32	40		7		
	89	-	71	60		V		
						П		
-		 						
-								
HAZ - Pipe SA-333 grad	e 6 side			1				
TIAL - Tipe OA-000 grad	87	T .	74	70	1	7		
-	89		75	60		7	-	
<u> </u>	49		Manager 1			7		
_	49		43	50	,			
						H	_	_
<u>-</u>						H		
UAZ Flores CA 250 em	de I E0 side							
HAZ - Flange SA-350 gra		1		0.0				
1	124		77	85		V		
	119	+	80	85		<u> </u>		
_	153		84	10	0	V		
							-	
CRITERES D'ACCEPTA	TION / ACCEPTANCE (CRITERIA:	ASME B31.	.3-2016 Table	323.3.5 = 20	Joules m	nimum	1*
RÉSULTATS / RESULTS	:	CONFORME	_		NON-COI	NEODME		
REMARQUE(S) / REMARK(S):		CONFORIVIE			NON-CO	ALOKINE		
*70% subsize specimen		iteria become	es 14 Joules n	ninimum avera	age.			
The parts being tested are kep	ot for a one month period aff	ter the results ha	ave been sent. Te	est results apply	only to the part	s being test	ed.	
This report can not be reprod	uced, except completely, wit	thout a written a	utorisation from	the laboratory.				
ESSAIS EFFECTUÉS PAR / TE	STS PERFORMED BY:							
Pascal Morin, ing.	Chef de service	2018-03-16						
TECHNICIEN / TECHNICIAN	QUALIFICATION	DATE						

¥.		



A. B. F Construction

Québec Canada J9Y 0A8

1310, Avenue Davy, Rouyn-Noranda,

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

Note: Les titres désignent également les hommes et les femmes

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

CAMIRAND, SÉBASTIEN (SC)

	Variables Variables		valeurs tual values		qualifiée tion 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
	Matériaux / Material	P1 à/to P1	P1 á/to P1	(P1 à/to P15F) (P34) (P41 à/to P49)	(P1 à/to P15F) (P34) (P41 à/to P49)
QW-403 Mélaux de base Base metals	Diamètre / Diameter	2.375" DE/OD	2.375" DE/OD	≥1" D.E / Q.D	≥ 1" D.E / O.D
Data matara	Chanf épaisseur / Groove thick	0.343"	0.343"	Aucune limite / No limit	Aucune limite / No limit
	Angle épais. I 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	Courant / Current	CC / DC	CC / DC	Tous / All	Tous / All
Électricité	Polarité / Polarity	EP / RP	EP / RP	Tous / All	Tous / All
Electrecity	Mode transfert / Transfer mode	N/A	N/A	N/A	NIA
	No spec. / Spec No (SFA)	5.1	5,1	5.1 5.4 5.5	5.1 6.4 5.5
QW-404 Métaux d'apport Filler metals	AWS Classe / Class	F3 E-6010	F4 E-7018	F3	F1, F2, F4
The metals	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-montan
QW-360 Machine	Automatique / Automatic	N/A	N/A	N/A	N/A

Résultat de pliage ou de radiographie l Guided bend or radiographic results

QW-191 Specimens

Pliage de coté Side bend Pliage transversal Transverse bend Pliage longitudinal Longitudinal bend Radiographie Radiographic

ACCEPTÉ / QUALIFIED

REFUSÉ / REFUSED

ACCEPTÉ

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

LABORATOINE D'ESSAL

ONGCIASNT-TC-1A Level II

Nous certifions que les renseignements ci-dessus sont exacts et que les essaies 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 weids were prepared, welded and tested in accordance with the requirements of Section IX of the ASME. Code.

Entreprise / Organization

A. B. F Construction

MEDBALTECH

1000.

Organisme autorisé / Accredited organization

Soudé le: Welded on

OCT 17 2019

Inspecteur: Inspetor.



Accepté: Accepted.

Refuse: Refused

Vérifiè le : Inspected on

Inspector:



A. B. F Construction

127-A, Avenue Marcel-Baril,

Québec Canada J9X-7B9

Rouyn-Noranda

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

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

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	Record ac		Gamme Qualificat	•
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
	Matériaux / Material	P1 àlto P1	P1 àlto P1	(P1 à/to P15F) (P34) (P41 à/to P49)	(P1 à/to P15F) (P34) (P41 à/to P49)
QW-403 Métaux de base Base metals	Diamètre / Diameter	2.375" D.E / O.D	2.375" D.E / O.D	≥ 1" D.E / O.D	≥ 1" D.E / O.D
Dudo motoro	Chanf épaisseur / Groove thick	0.343"	0.343"	Aucune limite / No limit	Aucune limite / No limit
	Angle épais. I 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	Courant / Current	CC / DC	CC / DC	Tous / All	Tous / All
Électricité	Polarité / Polarity	EP / RP	EP / RP	Tous / All	Tous / All
Electrecity	Mode transfert / Transfer mode	N/A	N/A	N/A	N/A
	No spec. / Spec No (SFA)	5.1	5.1	5.1 5.4 5.5	5.1 5.4 5.5
QW-404 Métaux d'apport Filler metals	AWS Classe / Class	F3 E-6010	F4 E-7018	F3	F1, F2, F4
riner metals	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 soutlen With backing
QW-405 Position	Position / Progression	6G Montant / Up	6G Montant / Up	Toutes positions-montant All positions-up	Toutes positions-montan 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 I QUALIFIED

REFUSÉ / REFUSED

QW-194 Visu / el / al Pénétration complète,

sion complète Complete joint penetry complete fusion



Level II

Nous certifions que les renseignements ci-dessus sont exacts et que les essaies de soudage ont été preparés et 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

Welded on: 14 SEPT 2018

Inspecteur:

Inspetor:

Accepté: Accepted.

Refusé: Refused:

Vérifié le Inspected on. Inspecteur Inspector



A. B. F Construction

Québec Canada J9Y 0A8

1310, Avenue Davy, Rouyn-Noranda

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

Note: Les titres désignent également les hommes et les femmes

Désignation de la DMS Using WPS No.

Enregistrement provincial Provincial registration

SMAW-11-1

RN-72.6

Nom du soudeur ou opérateur l' Welder or operator's name

ST-HILAIRE JOEL (J)

	Variables Variables		valeurs tual values		qualifiée lion 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
100 KC00 CF-01 C	Matériaux / Material	P1 à/to P1	P1 à/to P1	(P1 å/to P15F) (P34) (P41 å/to P49)	(P1 à/to P15F) (P34) (P41 à/to P49)
QW-403 Métaux de base Base metals	Diamètre / Diameter	2.375" D.E / O.D	2.375" D.E / O D	≥1" D.E / O.D	≥ 1" D.E / O.D
Data metale	Chanf. épaisseur / Groove thick.	0.343"	0.343"	Aucune limite / No limit	Aucune limite / No limit
	Angle épais. I Fillet thickness	Tous I 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
OW-409	Courant / Current	CC/DC	CC / DC	Tous / All	Tous / All
Électricité	Polarité / Polarity	EP / RP	EP / RP	Tous / All	Tous / All
Electrecity	Mode transfert / Transfer mode	N/A	N/A	N/A	N/A
	No spec. / Spec No (SFA)	5.1	5.1	5.1 5.4 5.5	5.1 5.4 5.5
QW-404 Métaux d'apport Filler metals	AWS Classe / Class	F3 E-6010	F4 E-7018	F3	F1, F2, F4
(1000)11101010	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

LABORATOINE O'ESSAI

Complete joint penetration, complete fusion

Nous certifions que les renseignements ci-dessus sont exacts et que les essaies de soudage ont été preparés et exel.

We certify that the statements in this record dessus sont exacts et que les essaies de soudage ont été preparés et exe 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 14-SEPT - 2018

Inspecteur: Inspetor:

Accepté: Accepted:

Refusė: Refused

Vérifié le : Inspected on Inspecteur Inspector

Procedure XP-AEM-001 Page 1 of 2

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).

Procedure XP-AEM-001 Page 2 of 2

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)

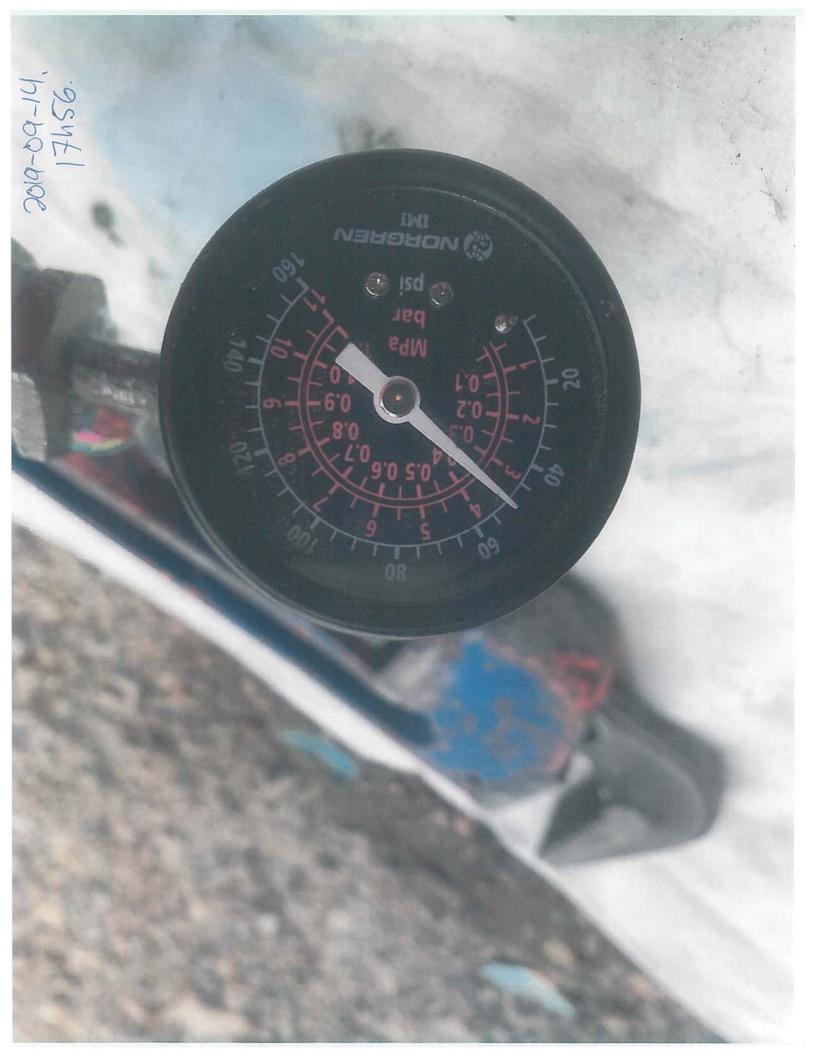
RÉFÉRENCES

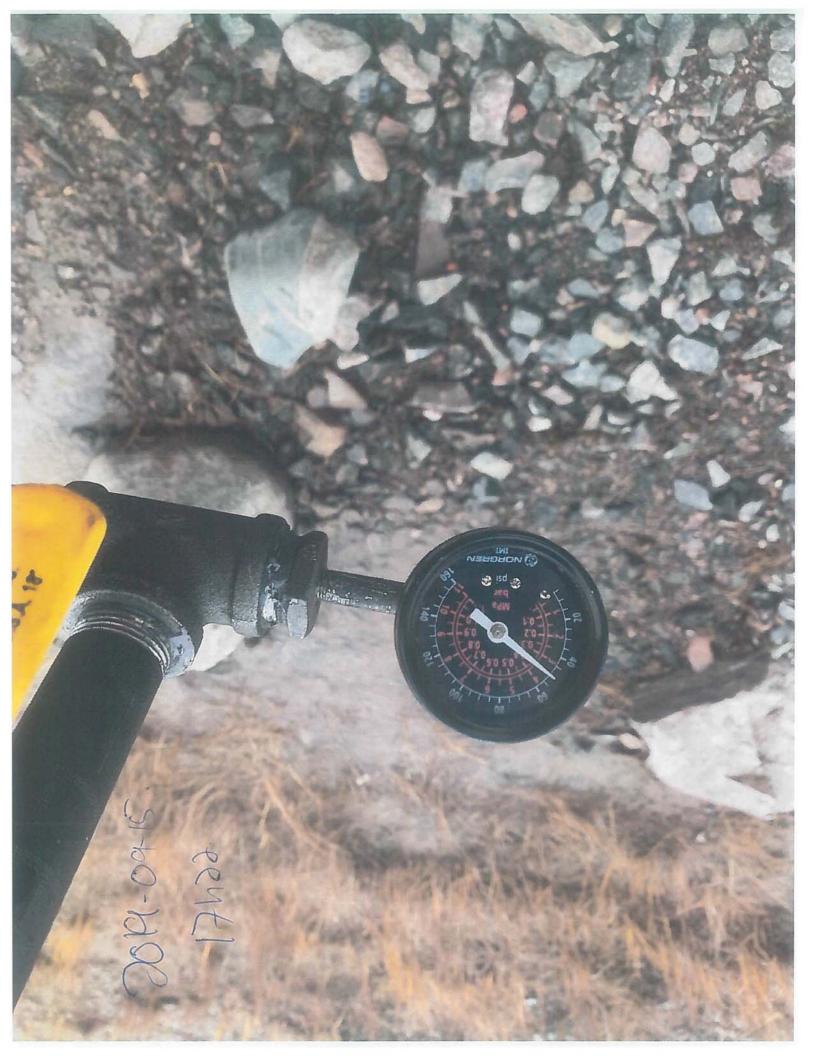
© Typical procedure Xenit Industries inc.



AEM / MPEI fuel tank Baker Lake Project no. 6120-C-265-001 Piping Pressure testing Report

			_	100									
	Result ² Ok / Drop	A STATE OF THE STA	3	Sept Sept Sept Sept Sept Sept Sept Sept						rctic		Rep. Gov. (If required)	
	Result' Ok Drop	>	1	7						Rep. ABF Arctic	Rep. AEM	Rep. Gov. (
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choir	Test Pressure (Psi)	50 psi	5005	15d 951									
Greening	Service										(date)	(date)	(date)
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	Hydro (Check)		10										
1	Date	M-60-114	21-60-610	F1-10-19									















SGTS CORPORATION

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

Date: 6/5/2019

Mill Test Reports

Invoice: 1596625-00

PO: 4072649

Cystomer: 49300-001

A.B.F MINES INC (ROUYN NORANDA

LIVRER A EQUIPEMENT KN 8254 RANG DU VIEUX PONT ROUYN-NORANDA, QC J9Y 0H4

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 176433 2530112 8 A333-6 STD BLK SMLS SRL 6 177833 2530112 8 A333-6 STD BLK SMLS SRL 8 A333-6 STD BLK SMLS SRL	ine	Heat#	7 -	Product	Description
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	6	177833)	2530112	8 A333-6 STD BLK SMLS SRL

vallourec

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



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 STANDARD: CSA-Z245,1-14 - CATEGORY II

1500 2530031

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

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 STENCELED IN THE PIPE BODY: 531796/10 MANUFACTURER CSA-7245.1-14 33,40 % 3,38 290 CAT II SS S HIN HEAT NUMBER ASTM A/ASIME SA 333, 1/6 HF SCH 040 LT -46C ASTM A/ASIME 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 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 5.8 # RESIDUAL MAGNETISM: MAX 30 GAUSS # ELECTROMAGNETIC TEST: CSAZ245.1-N10,LONTRAN,OUT/INS # ULTRASONIC TEST FOR LAMINAR DEFECTS: ACC. CSA Z245.1-SOUR SERVICE #





vallourec							ЕсоТире	6		E 29 8	RINA 190 received recovered to the received recovered re	OHEAS MIDDI		ž	: 0030	Inspect (According No.: 0030030837 / 00	rspect ccording	ion C	Inspection Certificate (According to DIN EN 10204.3.1)	Sheet.2 / 4
Chemical Composition (%)	0				ď.	ocess: B	asic Oxy	Process: Basic Oxygen Furnace, heats fully killed	ace, heats	fully kil	led									
Ceq: CSA-Z245.1-CE11					Ceq:	7+Mn/6+	(Cr+Mo	C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15	i+Cu)/15		CE1:	Cr+Cu	CE1: Cr + Cu + Mo + Ni + V	N+1						
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Product Analisys Min		3	0,400		0	0,100														
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Check 1	0	11'0	1,29 0,	0,011 0,	0,004	0,29 (10'0	0,06 0,01	0,029	9 0,074	4 0,005	710,0	0,0003	0,002	8600'0	0,0013	0,277	0,347	0,179	
Check 2	0	0,10	1,29 0,	0,011 0,	0,004	0,29	0,03	10'0 90'0	920,0 10	29 0,074	4 0,005	5 0,017	0,0003	0,002	8800'0	0,0013	0,267	0,337	0,179	
Ceq: Carbon Equivalent; Ceq: Carbon Equivalent; CE: Combined Elements;	Carbon Eq	uivalen	CE: C	mbined	Elemen	15														
Tensile Test																				
Specimen Direction: Longitudinal					Temp	erature:	Room T	Temperature: Room Temperature			Wall	Thickne	Wall Thickness: 3,38 mm	m			Gag	Gage Length: L0=2"	: L0=2"	
Method: Elong. Total Under Load 0,50 %	40,50%																			
						-	Type of Specimen	necimen			Area		YS	· Em	TS					
											(MM2)		(MPA)	W)	(MPA)	(%)				
			Required: Min	: Min									290	A	415	25				
				Max										9	625					
Hear Control Lot																				
176433 030003101210							FULL SECTION	SCTION			321,3		349	d	477	44				
							FULL SECTION	SCTION			330,4		355	ч	490	45				
VS-Yield Strength; TS-Tensile Strength; E-Elongation;	frength; E-	Elonga	ion;																	
Hardness Test Through Wall	Vall																			
Scale: HV																				
		Individual	lual																	
Required: Min																				
Max	**	246,0	0																	
					MWI	MWZ		MW3	Avg											
Heat Control Lot																				
176433 030003101210				0	01 160,0		159,0	162,0	160,3											
MW - Middle Wall;																				





Inspection Certificate (According to DIN EN 10204.3.1) Nº.: 0030030837 / 00

Sheet:3/4

LE AVE (Mils)

LE3 (Mils)

(Mills) L.E.2

55

55

55

Test Specimen: CHARPY 10X55X2.5 V NOTCH		Direct	ion: Longit	udinal			Temp	erature: -	25°C			S	riker radiu	1: 8 mm
		AEI	AEI AEZ AE3	AE3	AE4		AEAvg	SA1	SAZ	SA3	SA4	SAS	SA Avg	LEI
		(5)	(2)	(r)	5	6	(%) (%) (f)	(%)	(%)	(%)	(%)	(%)	(%) (%) (%)	(Mills)
	Required: Min	7	7	7			7	20	50	20			0.9	
	Max													
Heat Control Lot														
176433 030003101210		52	99	55			54	100	100	100			100	55

Remarks:

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

2. SKU 2530031

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

DIRECTIVE 2014/68/UE ANNEX 1 PAR. 4.3 (CERTIFICATE 2016 BH MP 02-03

- MATERIAL ACCORDING TO PED 2014/68/UE ANNEX I PAR. 7.5 VALID UNTIL 12.05.2019).

"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





Inspection Certificate

(According to DIN EN 10204.3.1) No.; $0030030837\,/\,00$

Sheet:4/4

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 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 documents and will be subject to criminal jurisdiction.

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

e-mail:luis.silva@vallourec.com

11.20.2018 DATE

> TECHNICAL MESPONSIBLE ENG. LUIZ FERNANDO DA



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



Inspection Certificate (According to DIN EN 10204,3.1) N°.: 0030023868 / 00

Sheet; 1/3

Customer: VALLOUREC CANADA INC

Country; Canada

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

Inspection: Vallouree 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 1

2530074

18

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 (PPPE RODY): 40,60 mm / +40,60 mm WALL THICKNESS: -0,49 mm / +4,78 mm

LENGTH: RANDOM 5486,00 mm - 6706.00 mm

STANDARD MARKING; Paint steadaled to the bary: 509784/10 MANUFACTURER CSA-7245.1-14 60.30 X 3.90 290 CAT II SS 3 11N LENGTH HEAT NUMBER ASTM AVASME SA 333, 1/6 10F SCH 040 LT -46C NACE MR 0175/NACJE MR 0103 VSB LOGO

SHIPPING MARKING: MADE IN BRAZIL * VM4238 / P.O # 4137205-00 * VANCOUVER

FOLERANCES(PIPE ENDS); OUTSIDE DIANETER: -0,40 mm / +0,80 mm

Pieces 122 122 Total 141352 Heat

THE PRODUCT IS SATISFACTORY IN THE FOLLOWING TESTS / INNPECTIONS: DIMINISIONAL # VISUAL # FLATTHAING TIST BEING INSPECTION: UNTHEFIELD ENDS CROPPED # HYDROSTATIC TEST: 20700.0 KPA 5.5. # RESIDUAL MAGNETISM: MAX 30 GAUSS # TESTE ELETROMAGNÉTICO : ACCORDING TO CSA 2245.1 # ULTRASONIC TEST FOR LAMINAR DEFECTS: ACC., CSA 2245.1-SOUR SERVICE #

Jent: CSA-Z	Cey; CSA-Z245,1-CE11			CEL: MIVC	10/1											
		c	Mis	4	95	175	ž	Cr	Mo Cu	Cu	>	N.	Nb B Tr Ceq	Ц	Ceq	CEI
Heat Analisys			0,400			0,100										3,000
	Max	0,240	1,150	0,025	0,025	0.500	0,4160	0.300	0.120	0.400	0.080	0.020	0.0010 0.110	0.110	0,400	
'roduct Analisys			DOF'O			0,100										3,0XYD
	Mus	0,240	1.350	0,025	0,025	0,500	(),4()()	NX)	0,120 0,	0,400	0,080	0,020	0,00,0	0,00(0 0,110	0010	
Heat	Control Lat															
141352	030002889902	0,10	1,32	0.020	100'0	0.31	10'0	70.07	60,03	0.010	0,006	0,015	0.0002	0,002	0,342	(3,200
	Cheek I	0,10	1,32	0,020	0.001	0,31	10'0	0,07	600	0,012	0,00%	0,016	0,0002		0,343	(2,94)
	Check 2	0.10	1,32	0,020	100,0	0.31	10'0	0,07	0.03	0,012	0.006	0.016	50000		0.343	12,816





Inspection Certificate (According to DfN EN 10204.3,1) N°.: 0030023868 / 00

Sheet(2/3

Tensile Test

7.5 Area Gage Length: L0=2" Type of Specimen Temperature: Room Temperature Specimen Direction: Languadmal

Method: Flong/Total Under Land 0,50%

(35)

(ATPA) (NIPA) 290 (NINEZ) Required: Min Mus

517 41.5 625 3()6 N3,6

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

Control Lat 0,700X128X99012

Heal

141352

STRIP WIDTH 19,05 MM

Hardness Test Through Wall

AE3 163,0 AVE MW3 AE2 160,0 MINZ 166,0 NIVI 163,0 Individual 246,0 5 Mus Required: Min Control Lat 141352 U30X02889902 MW - Middle Wall; Scale: 11V

Striking tup: 8 min AEAVE Temperature: -57°C AES AEA AE3 AE2 Direction: Langitudinal AFI Test Specimen: CHARPY 10X55X2.5 V Impact Test NOTCH

(7) 6 5 7 5 7 177 Required: Min Max

46 9 7 Control Lot 141352 030002889902 AE - Absorbed Energy;

57

Remarks:

1. MATERIAL IN ACCORDANCE WITH NACE MR 0175

PAR, 3.2/ISO 15150-2, ANNEX A, 2.1.2/NACE MR0103 PAR, 2.1. ALL LA TEST EDITIONS.

2, SKU 2530074





Inspection Certificate (According to DIN EN 10204.3.1)

N°.: 0030023868 / 00

Sheet:373

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

-PELLY KIILED STEEL

- NIATERIAL FROM BRAZII,

QUALITY CONTROL DEPARTMENT FAX: (55-311 3328-2617 satisfactory. This testimanial and certificate respectively is recarded by a computer system and 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

r-mail:gustavo.pinbeiro@vallourre.com

is valid without signature. Afteration or use for others products are regarded as falsification of

documents and will be subject to criminal jurisdiction,

DR. GUSTAVO ALVIS PLANIERICA CREAMIC-TOWTOND TREUDANCAL HESTONSHILE.

08.14.2017

DATE

ECO TUBES: The tubes from Vallauree do Brazil S.A. are manufactured with steel which asses charcool as a source of energy in its production. This coal comes from more than 100,000 in of forest planted by Vallouree Florestal Lidia. With the nequisition of 4,6 tonus) as steel inbes from Vallource du Brasil S.A., your company contribated to the reduction of the greenhouse effect, avoiding the necumulation of 8,3 ton(s) of Carbun Diaxide CO2 in the atmosphere.

Benteler Steel/Tube GmbH 33043 Paderborn Postfach 13 40 Deutschland

Steel/Tube

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

No. du certificat:

Inspection No.:

POI-Nr.:

10

Page

(DIN EN ISO 9001, ISO/TS-16949 CERTIFIED BY TUEV NORD CERTI PED 2014/68/EU CERTIFIED BY TUEN NORD SYSTEMS Warmrohrwerk Dinslaken

Manufacturer: Producteur: 16005849 / CCTF 4038177-00 Hersteller:

Manufacturer's brand: Herstellerzeichen:

1646606

No. de commande du client:

Purchase Order No.

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

CCTF Corporation

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

ABNAHMEPRÜFZEUGNIS EN 10204-3.1

CERTIFICAT DE RECEPTION EN 10204-3.1 INSPECTION CERTIFICATE EN 10204-3,1

EN 10204:2005-01

Tel.: + 49.5254.81-0 Fax: + 49.5254.13666

Kunden-Bestell-Nr.:

Benteler Auftrags-Nr.

Benteler Order No.:

6591130

No. de commande Benteler

Versandanzeigen-Nr.:

Dispatch Note No.:

NAHTLOSE STAHLROHRE

No. d'avis d'expédition

SEAMLESS STEEL TUBES

Product: Produkt:

Marque du producteur:

Stempel des Abnahmebeauftragten:

WA

Stamp of the inspection representative:

Stahlerschmelzungsverfahren: Poinçon du contrôleur:

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

ASTM-A 106-2015, ASTM-A 333-2016-HF, ASMESA-106, ASMEBPVC.II.A-2017, ASMESA-333-HF, ASME TUBES D' ACIER SANS SOUDURE Produit

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

ASMESA-106, ASMEBPVC.II.A-2017, ASTM-A 106-2015, ASMESA-999 ASMEBPVC.II.A-2017, ASTM-A 999-2016 Maße - Toleranzen: Dimensions-tolerances:

Conditions de livraisan

Terms of delivery:

Lieferbedingungen

GRADE 1, GRADE 290, GRADE 6, GRADE B Dimensions-tolerances:

Stahlsorte: Steel grade:

Lieferzustand: Nuance d'acier.

Normalized

Delivery condition: Elat de livraison FS: BENTELER Z.245.1 - 14 - A / SA-106 / A / SA-333 B/1/6/290 CATEGORIE 2 SS HEAT-NO. LT Produktkennzeichnung.

50 SMLS HN DIMENSION TEST PRESSURE S6 WA GERMANY PO 4038177-00 / 2530090 DIMENSIONS

SCHEDULE

Marquage du produit

Product marking:

PS: HEAT-NO. DIMENSIONS SCHEDULE B/1/6/290 SS

ARZ = Atzlinkerbaschriftung, Biching ink marking, Gavure à l'encre FK = Farbkennzeichnung, color marking, marquage par cooleur FS = Farbschablonierung, pain; stencing, marquage par peinture . FSD = Farbschablonierung, ink jel spray marking, marquage par peinture . FS = Pabgastempe, die stanp, marquage par peinture . FSD = Farbschaung, ink jel spray marking, mortimante à jel concernance de l'acceptance de la concernance de la concernance de l'acceptance de la concernance de la d'encre

Benteler Steel/Tube GmbH Pos/fach 13.40 33043 Paderborn Deutschland Tel.; + 49.5254,81-0 Fax; + 49.5254,13686

Steel/Tube

ABNAHI	MEP	ABNAHMEPRÜFZEUGNIS EN 10204-3.1	10204-3.1	Dokument-Nr.: Document No.:		65-1069887/001/E	4.5	rüf-Nr.: nspection No.:		Blatt: 21 6 Page:
CERTIFICAT	DE RE	CERTIFICAT DE RECEPTION EN 10204-3.1		No. du docui	ment:		Z	No. du certificat:		Page:
Pos. Stück Maße	ück	Маßе			Gesamtlänge	Gewicht	Schmelzen-Nr.	Ir. Prüfdruck	Rohr-NrGruppe	Vielfachlängen
Item Nui	Number	Dimensions			Length total	Weight	Heat No.	Test pressure	Tube number group	Multiple lengths
Poste Nombre	mbre	Dimensions			Longueur totale	Poids	No. de coulée	Pression d'épreuve	Série de no. des tubes	Longueurs multiples
			(e)	eet	Feet	lbs		PSI s		
0002 72	O.	4" NPS * Sched. 40 353009D	40 75	30000	1570,90	17284	610879	2650 5		

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

Pos.	Schmelzen-Nr.	O	S	NN	۵	S	CR	MO	Z	CO	^	NB	F	В
ltem	Heat No.													
Poste	No. de coulée													
0002	610879	0,130	0,320	1,25	0,008	100'0	0,14	90'0	0,25	0,11	0,062	0,014	0,003	0,000

1. Formet:

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

2. Formel: 3. Formel:

Cr+ Cu+ Mo+ Ni+ V< = 1,00 % 4. Formel: Formelergebnisse / Formula results / Résultats des formules

Pos.	Schmelzen-Nr	1. Formel	2. Formel	3. Formel	4. Formel	
tem	Heat No.	1,	2.	3.	4.	
Poste	No, de coufée	Ť.	2.	E.	4,	
0000	610879	0,415	0,369	9,615	0,622	

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

	В		0,0004
	F		500,0
	NB		0,017
	>		0,067
	CI		60'0
	Z		0,26
	MO		90'0
	CR		0,15
	(J)		0,003
	۵		0,004
	MN		1,21
	SI		0,320
	O		0,130 0,
Schmelzen-Nr.	-	nlèe	
Pos. S	llem		0000

1. Formel:

CE IIW= C+ (Mn/6)+ ((Cr+ Mo+ V)/5)+ ((Cu+ Ni)/15)< = 0,42 % CEV= C+ F* ((Mn/6)+ (Si/24)+ (Cu/15)+ (Ni/20)+ ((Cr+ Mo+ V+ Nb)/5) + (5* B)) < = 0,40 %

Mn/C> = 3/1

Cr+ Cu+ Mo+ Ni+ V = 1,00 % 2, Formel: 3. Formel: 4. Formel:

Benteler Steel/Tube GmbH Postfach 13 40

33043 Paderborn Deutschland

Tel.: + 49,5254,81-0 Fax: + 49,5254,13666

02 Page: Steel/Tube No. du certificat. Inspection No.: Prof-Nr. 65-1069887/001/E Dokument-Nr.: No. du document: Document No.: Formelergebnisse / Formula results / Résultats des formules ABNAHMEPRÜFZEUGNIS EN 10204-3.1 CERTIFICAT DE RECEPTION EN 10204-3,1 INSPECTION CERTIFICATE EN 10204-3.1

4. Formel 0,627 3. Formel 9,308 m 2. Formel 0,366 N 1. Formel 0,410 Schmelzen-Nr No. de coulée 610879 Heat No. 0000 Poste Pos. llem.

PASSED Hydrostatic test: acc. to CSA Z245.1, holding time min 5 seconds, Test pressure/Time-record The tubes have been submitted to a leak tightness test by: Prüfergebnisse / Test results / Résultats des essais Die Rohre sind auf Dichtheit geprüft durch:

PASSED ET-test: acc. to CSA Z245.1; for imperfections; drilled hole: 3,20 mm Die Rohre wurden zerstörungsfrei geprüft: Les lubes ont passe un contrôle d'étanchelle par The tubes are non destructive tested:

PASSED Essai d'aplatissement Ringfaltversuch: Flattening test: PASSED Vérification des dimensions; Dimensions examination: Maßkontrolle: PASSED Les tubes ont passé un essai non destructif: Augensichtkontrolle: Visual inspection: Examen visuel;

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	Probenabme	Ssung	Streckgrenze	Zugfestigkeit	Dehnung		
Item	Specimen No.	Heat No.	Specimen dime	insions	Yield strength	Tensile strength	Bongation		
Poste	No. de l'éprouv.	// No. de coulèe	Dimensions de	l'eprouv.	Limite elastique	Résistance à la traction Allongement	an Allangement		
Anforderungen	rungen				RT 0,5 %	Rm	A2"	1. Formel	
Requirements	ents		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		
0000	000000	610879	25,40 X	6,10	58305	78320	32,00		
0000	000000	610879	25,40 X	6,20	58885	77305	32,00		
0000	000000	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

Pos.

Steel/Tube

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4 /

Page: Blatt:

Inspection No.: No. du certificat. Prof-Nr. 65-1069887/001/E Dokument-Nr.: No. du document. Document No.: Härte A BNA HMEPRÜFZEUGNIS EN 10204-3.1 INSPECTION GERTIFICATE EN 10204-3.1 CERTIFICAT DE RECEPTION EN 10204-3.1 Schmelzen-Nr. Härteprüfung / Hardness test / Essai de dureté Proben-Nr.

H MAX 200 158 159 160 156 里 Hardness Durelè IRC No. de coulée 610879 610879 610879 610879 Heat No. No. de l'eprouv. Specimen No. 000000 E00000 100000 000000 Anforderungen Requirements Exigences 0000 0000 0000 0000 Poste Item

HBW

HRB

Kerbschlagbiegeversuch Notched bar impact test / Essat de flexion par choc (résilience) [1 CHARPY V]

Specimen position: longitudinal (L); Test temperature: -51 F Probenlage: längs (L); Prüftemperatur: -51 F

os.	Proben-Nr.	Proben-Nr. Schmelzen-Nr. Probenabmessung	Probena	brnessur	gr.	Kerbschlagarbeil	garbeit	Kerbschlagzähigkeit	zähigkeit	VerfBruc	thanteil	t VerfBruchanteil Laterale Breitung	reitung	Sprödbruchante	hanteil
me	Specimen No. Heat No.	Heat No.	Specimen	Specimen dimensions	52	Absorbed energy	ergy	Impact strengt	gth	Shear fracture	le le	Lateral expansion	nsion	Brittle Fracture	ire
ste	Poste No. de l'éprouv. No. de coulée	", No. de coulée	Dimension	Dimensions de l'éprouvette	uvette	Energie absorbée	rbèe	Résistance au c	u chac	Rupture ductille	(Ile	Expansion lateral	Itèrai	Rupture Fragile	lle.
nfor	derungen		Länge Breite	Breite	Höhe	einzel	mittel	einzel	mittel	einzel	mittel	einzel	mittel	einzel	mittel
quire	sments		Length	Width	Height	single	average	single	average	single	average	single	average	single	average
xigences	Sep		Langueur	Longueur Largeur Hauteur	Hauteur	individuelle	movenne	mayenne individuelle	moyenne	individuelle moyenne	тоуелле	individue	He moyenne ind	individuelle	moyenne

		mm 55	mm 5,00	mm 10,00	J MIN 014	7	Jlcm²	%	%	тиш	шш	
102 000001	610879	55	5,00	10,00	88			7.0		2,20		
			2,00	10,00	63			20		2,10		
			2,00	10,00	85	B 7		7.0	10	2.00	2,10	

Tel.: + 49,5254,81-0 Fax: + 49,5254,13666 Benteler Steel/Tube GmbH 33043 Paderborn Deutschland

Dokument-Nr.:

BENTELER 🛡

Steel/Tube

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Blatt: Page:

> No, du certificat Inspection No.:

Prut-Nr.

65-1069887/001/E No. du document: Document No.: ABNAHMEPRÜFZEUGNIS EN 10204-3.1 CERTIFICAT DE RECEPTION EN 10204-3.1 INSPECTION CERTIFICATE EN 10204-3.1

Kerbschlagbiegeversuch Notched bar impact test / Essai de (lexion par choc (résilience) [2 CHARPY V] Probeniage: quer (Q), Prüftemperatur: -51

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

Ų.

Pos. Proben-Nr.														
	Pos. Proben-Nr. Schmelzen-Nr. Probenabmessung	Probena	pmessur	β ₁	Kerbschlagarbe	garbeit	Kerbschlagzähigkeit	zähigkeit	VerfBruchanteil	chanteil	Laterale Breitung	Sreitung	Sprodbruchante	shanteil
Item Specimen No. Heat No.	Heat No.	Specimen	Specimen dimensions	is.	Absorbed en	rergy	Impact strength	gth	Shear fracture	ure	Lateral expansion	ansion	Brittle Fracture	ire
Poste No. de l'éprouv. No. de coulée	No, de coulée	Dimensions de l'éprouvette	s de l'épro	uvette	Energie absorbée	rbée	Résistance au choc	a choc	Rupture duc	stile	Expansion lateral	alèral	Rupture Fragile	ille
Anforderungen		Länge	Länge Breite Höhe	Höhe	einzel	mittel	einzel	mittel	einzel	mittel	einzel	mittel	einzel	mittel
Requirements		Length	Width	Height	single	average	single	average	single	average	single	average	single	average
Exigences		Longueur	ongueur Largeur Hauteur	Hauteur	individuelle	moyenne	individuelle	moyenne	individuelle n	тауеппе	individuelle	moyenne	individuelle	тоувипе
		шш	mm	mm	7	7	J/cm²		9/0	%	mm	man		

Wärmebehandlung / Heat treatment / Traitement thermique

1,10

09

33

32 33

10,00 10,00 10,00

2,00 2,00 5,00

55 52

610879

100000

0000

1,10 1,20 1.00

MIN 60

MIN 50

MIN 020

MIN 014

10,00

5,00

09 09 0.9

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 ensure that all environmental requirements as well as the requirements regarding engineering, construction and operation of 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 acilities 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-E112; Grain size and finer: 6

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

Benteler Steel/Tube GmbH

Postfach 13 40 33043 Paderborn

Deutschland Tel.: + 49,5254,81-0 Fax: + 49,5254,13666 ABNAHMEPRÜFZEUGNIS EN 10204-3.1 INSPECTION CERTIFICATE EN 10204-3.1 CERTIFICAT DE RECEPTION EN 10204-3.1

65-1069887/001/E

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

37/001/E Prüf-Nr.: Inspection No.: No. du certificat:

Steel/Tube Blatt:

Page:

BENTELER 🛡

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Ahrahmebauffrag

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

Abnahmebeauftragter Inspection representative Contrôleur

i. A. Patrick Harraths / 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 livres sont conformes aux stipulations de la commande. Ce document a été établi par traitement électronique de l'information et est valide sans signature.



Vallource Soluções Tubulares do Brasil S.A. Burreiro Plant - Av. Olinio Meireles. 65 ZIP 30640-010 - Belo Hortzonie, MG



Inspection Certificate

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

Sheet:1 / 4

Castomer: 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 STANDARD: CSA-2245.1-18 - CATEGORY II

550 2530104

IN ACCORDANCE ALSO TO THE STANDARDS: ASTW A 333M-18 ASTW A 999M-18 # ASTW A 106M-18 ASTW A 530M-18 # ASTW A 530M-18 # ASME SA-333M-17 ASME SA 999M-17 # ASME SA-106M-17 ASME SA

M-17

CUSTOMER SPECIFICATION: CCTF Grb.16,290 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 / -1,97 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: 53621/20 MANUFACTURER CSA-7245-1-18 168,30 X 7.11 290 CAT II MAGC SS S HI LENGTH HEAT NUMBER ASTM A/ASME SA 333, 1/6 HF SCH 040 LT -46C AST:M A/ASMESA 106 B 18400 KPA WEIGHT ASTM A 53 B VSB LUGO

SHIPPING MARKING; NPS 6" X SCH 40 NACE MR 0175/NACE MR 0103 - MADE IN BRAZIL.* VM4811 / P.O.# 4038915-00/JTEM-2.* TORONIO * CCTF

Pieces	11	24	68	124
Heat	175147	175724	178322	Total

THE PRODUCT IS SATISFACTORY IN THE FOLLOWING TESTS / INSPECTIONS: DIMENSIONAL # FLATTENING TEST # ISIDS INSPECTION: UNTESTED ENDS CROPPED # HYDROSTATIC TEST: 18400.0 KPA 5.5 # 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 #





Creation Composition (%) Creation Compositio	vallourec	Sec					m@d.	EcoTube	96		(4)	RINA BONE BONE BANK BONE BONE BONE BONE CONTRIBUTION ON SHAPE	RINA sores soprime sores soprime contractions	- 1	Z	Inspect (According N°.: 0030032296 / 00	00322	nspec	tion C	Inspection Certificate (According to DIN EN 10204.3.1) 296 / 00	Sheet: 2 / 4	1
Crest C-Marido+ (Cr-Mater-Vy/5 - (NH Cra) S CET: Cr + Cu + Mo + Ni + V																						
CECCI: C-Matiré - (C-r-Matiré	Chemical Compos	ition (%)					Proces	:: Basic O	xygen Fu	rnace, he	ats fully	ballio										
0,023 0,023 0,020 0,400 0,120 0,400 0,00	Ceq: CSA-Z245, I-CE1					Ü	PQ: C-I MI	V6+(Cr+A	10+17/5+	(NIICH)	No.	CE	71: Cr + C	a + Mo +	N: + V							
0.025 0.025 0.026 0.400 0.200 0.120 0.020 0.000 0.000 0.000 0.000 0.000 0.010			C			V.	S	ŝ	C						F	Z		Ceq	Ceq	CEI		
0,025 0,025 0,206 0,400 0,400 0,4120 0,400 0,4	Heat Analisys	Min		0,400			0,100															
0,025 0,025 0,020 0,400 0,300 0,120 0,012 0,022 0,0010 0,110 0,110 0,010 0,010 0,110 0,110 0,01		Max	0,240							0,120	0							0.400	0,430	000,1		
0,010 0,007 0,30 0,40 0,410 0,4120 0,4120 0,402 0,004 0,010 0,41	Product Analisys	Min		11,400			0,100															
0,010 0,007 0,20 0,01 0,04 0,01 0,023 0,023 0,004 0,016 0,0003 0,003 0,001 0,01 0,01 0,000		Max	0.24					0.400		0,120	0							0,400	0,430	1,000		
0,010 0,007 0,30 0 0,01 0,04 0,01 0,02 0,020 0,004 0,010 0,000 0,																						
0,010 0,005 0,29 0,20 0,01 0,84 0,01 0,028 0,023 0,004 0,017 0,0002 0,003 0,003 0,001 0,030 0,000 0,0		23	0,12					0.01	0,04								0.0013	0,309	0,351	0,084		
0,000 0,000	Check		0,13					10'0	0,04									0,309	0,348	0,088		
0,000 0,000	Check 2		0,12					10'0	0,04									0.308	0,347	0,086		
0,000 0,002 0,28 0,02 0,03 0,03 0,029 0,003 0,010 0,000 0,0		35	0.11					0.02	50.0									0,284	0,347	0.115		
μρου (μοτ)	Check I.		0.11					0.02	0,05									0,285	0,346	0.116		
0,012 0,003 0,29 0,04 0,06 0,02 0,028 0,082 0,004 0,016 0,002 0,007 0,0018 0,02 0,013 0,003 0,29 0,04 0,06 0,02 0,03 0,032 0,007 0,001 0,017 0,0002 0,007 0,001 0,014 0,22 0,011 0,004 0,30 0,04 0,06 0,02 0,02 0,032 0,007 0,001 0,018 0,22 0,011 0,004 0,30 0,04 0,06 0,02 0,02 0,03 0,007 0,001 0,018 0,22 0,011 0,004 0,30 0,04 0,06 0,02 0,02 0,001 0,017 0,0002 0,003 0,007 0,013 0,22 0,011 0,004 0,30 0,04 0,06 0,02 0,02 0,03 0,007 0,001 0,018 0,22 0,011 0,004 0,30 0,04 0,06 0,02 0,02 0,001 0,018 0,22 0,001 0,002 0,007 0,001 0,001 0,02 0,001 0,002 0,007 0,001 0,001 0,02 0,001 0,002 0,007 0,001 0,001 0,02 0,001 0,002 0,007 0,001 0,001 0,02 0,001 0,004 0,30 0,001 0,001 0,001 0,02 0,001 0,004 0,30 0,001 0,001 0,001 0,001 0,001 0,001 0,004 0,30 0,004 0,30 0,004 0,006 0,002 0,007 0,001 0,001 0,004 0,30 0,004 0,30 0,004 0,006 0,002 0,007 0,001 0,001 0,004 0,30 0,004 0,30 0,004 0,30 0,001 0,001 0,001 0,001 0,001 0,004 0,30 0,004 0,30 0,004 0,30 0,001 0,0	Check 2		0,11					0,02	0.05									0,287	0,346	0,115		
0,013 0,003 0,29 0,04 0,06 0,02 0,030 0,082 0,004 0,015 0,0002 0,007 0,0014 0,026 0,011 0,004 0,30 0,044 0,06 0,02 0,002 0,003 0,007 0,0013 0,036 0,011 0,004 0,30 0,044 0,06 0,02 0,002 0,003 0,007 0,013 0,036 0,011 0,004 0,30 0,044 0,06 0,02 0,004 0,015 0,0002 0,003 0,007 0,013 0,036 0,011 0,004 0,30 0,044 0,06 0,03 0,044 0,07 0,041 0,044 0,07 0,041 0,044 0,		11	0,10					0.04	90'0									0,267	0,348	0,201		
### Combined Elements: Combined Elements: Type of Specimen Temperature: Room	Check 1		0,10					0.04	90.0									0,269	0,350	0,197		
Type of Specimen Area VS TS E Type of Specimen Area VS TS E (MM2) (MPA) (MPA) (%) Lired: Min Ass STRIP WIDTH 25,4 MM (188.5 376 300 40 STRIP WIDTH 25,4 MM (188.8 371 486 39 STRIP WIDTH 25,4 MM (188.8 371 486 39 STRIP WIDTH 25,4 MM (188.8 370 489 39) STRIP WIDTH 25,4 MM (188.8 370 489 39) STRIP WIDTH 25,4 MM (189.2 369 369 39) STRIP WIDTH 25,4 MM (189.2 373 489 39) STRIP WIDTH 25,4 MM (189.2 373 489 39) STRIP WIDTH 25,4 MM (189.5 356 489 39)	Check 2		0/10					0.04	90'0									0,267	0,347	6,203		
Temperature; Room Temperature Mail Thisknesst 7,11 mm Type of Specimen Area YS TS E (MMZ) (MPA) (MPA) (%) 290 415 33 Mat STRIP WIDTH 25,4 MM (188.5 376 505 40 STRIP WIDTH 25,4 MM (188.8 371 486 39 STRIP WIDTH 25,4 MM (188.8 370 489 39) STRIP WIDTH 25,4 MM (188.8 370 489 39) STRIP WIDTH 25,4 MM (189.2 369 500 39) STRIP WIDTH 25,4 MM (189.2 369 373 489 39) STRIP WIDTH 25,4 MM (189.2 373 489 39) STRIP WIDTH 25,4 MM (189.5 355 488 39)	Ceq: Carbon Equivak	nf; Ceq: Carb	on Equiv	alent; C	E: Comb	ned Elen	tients;									4						
Temperature; Room Temperature Mall Thisknesse 7.11 mm Type of Specimen Area YS TS E (MMZ) (MPA) (MPA) (%) 250 415 33 Max STRIP WIDTH 25,4 MM (188.8 370 486 399 STRIP WIDTH 25,4 MM (188.8 371 486 399 STRIP WIDTH 25,4 MM (188.8 371 486 399 STRIP WIDTH 25,4 MM (188.8 370 489 399 STRIP WIDTH 25,4 MM (189.2 369 492 492 STRIP WIDTH 25,4 MM (189.2 373 492 492	Tensile Test																					
Type of Specimen Area YS TS MM2) (MPA) (MPA) 290 415 Mas STRIP WIDTH 25,4 MM (190,0 382 505 STRIP WIDTH 25,4 MM (186,2 350 500 STRIP WIDTH 25,4 MM (186,2 369 500 STRIP WIDTH 25,4 MM (186,2 369 500 STRIP WIDTH 25,4 MM (189,2 37) 489 STRIP WIDTH 25,4 MM (189,2 37) 492 STRIP WIDTH 25,4 MM (186,5 355 448) STRIP WIDTH 25,4 MM (186,5 356 348)	Specimen Direction; La	nngitudinal				T	imperatu	re; Room	Temperal	BIC.		W	all Thicke	11.7 15551	um			Css	ge Leng	th; L0=2"		
Type of Specimen Area YS TS MMZ) (MPA) (MPA) STRIP WIDTH 25,4 MM (188,2 376 505 STRIP WIDTH 25,4 MM (188,2 371 486 STRIP WIDTH 25,4 MM (188,2 371 486 STRIP WIDTH 25,4 MM (188,2 370 489 STRIP WIDTH 25,4 MM (189,2 373 492 STRIP WIDTH 25,4 MM (189,2 373 492 STRIP WIDTH 25,4 MM (189,2 373 492 STRIP WIDTH 25,4 MM (186,5 355 488	Method: Elong. Total U.	nder Load 0,50	%																			
Mas Mas STRIP WIDTH 25,4 MM								Type of	Specimen			Are		YS		TS	LIU.	July 1				
### STRIP WIDTH 25,4 MM 188.5 376 415 STRIP WIDTH 25,4 MM 190,0 382 505 STRIP WIDTH 25,4 MM 186,2 369 510 STRIP WIDTH 25,4 MM 188,8 370 489 STRIP WIDTH 25,4 MM 189,2 373 492 STRIP WIDTH 25,4 MM 189,5 355 488 STRIP WIDTH 25,4 MM 185,9 360 492												(MM	7)	(MPA)	0	(IPA)	(6)	(
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STRIP WIDTH 25,4 MM 188,8 370 489 STRIP WIDTH 25,4 MM 189,2 373 492 STRIP WIDTH 25,4 MM 189,2 373 492 STRIP WIDTH 25,4 MM 186,5 355 488 STRIP WIDTH 25,4 MM 186,5 360 492		50					00	TRIP WI	DTH 25,4	MM		188	50	371		486	6					
STRIP WIDTH 25,4 MM 189,2 373 489 STRIP WIDTH 25,4 MM 186,5 355 488 STRIP WIDTH 25,4 MM 186,5 355 488							VI.	TRIP WIL	DTH 25,4	MIM		.58	7	369		500	ř.					
STRIP WIDTH 25,4 MM 186,5 355 492 STRIP WIDTH 25,4 MM 185,9 360 492	0300031400.	11					S)	TRIP WIL	DTH 25,4	MM		188	95	370		489	m					
STRIP WIDTH 25,4 MM 186,5 355 488 STRIP WIDTH 25,4 MM 185,9 360 492							9/2	TRIP WI	DTH 25.4	MM		189	2	373		492	12.					
STRIP WIDTH 25,4 MM (85,9 360 492	178322 0300031556	11					101	TRIP WI	OTH 25,4			186,	2	355		50.00	m					
							S	TRIP WI	21H 25,4			185	6	360		492	v					





NA HOUSE SEEN SHEET HOOF

Inspection Certificate (According to DIN EN 10204.3 1) No.: 0030032296 / 00

Sheet:3 4

Hardness Test

Scale: HV

150,0 (67,0) 167,0 143,0 Max Max 246,0 156,0 163,0 0.63.0 143,0 Required: Min 175147 030003140032 175724 030003127905 030003140031 178322 030003155671 Heat Control Lot

Test Speciment: CIARPY 0.X35X5 V NOTCH Acti Acti	Impact Test																	
4E AE2 AE3 AE4 AE5 AE Avg SA1 SA2 SA3 SA4 SA5 SAAvg LE1 LE2 LE3 LE3 41	Test Specimen: CHARPY 10X55X5 V No	DTCH	Direct	ion: Longi	tudinal			Tem	peruture	J. E5- :			WZ	triker radiu	s: 8 mm			
(1)			AEI	AEZ		AE4	AES	AE AVE	SAI	SAZ	SA3	SAG	SAS	SA AVE	LEI	LEZ	1.F3	LE Avg
14 14 14 14 14 14 14 15 123 100 100 100 100 100 100 64 64 65 66 65 65 65 65			(1)	5	(3)	(1)	(1)	(2)	(%)	(%)	(%)	(%)	(%)	(%)	(Mils)	(Wils)	(Mils)	(Mils)
122 123 123 123 123 123 100 100 100 100 100 64 64 65 122 122 122 122 123 120 100 100 100 100 100 64 64 67 123 124 142 151 146 100		Required: Min	14	14	14			14	20	20	50			09				
122 123 123 123 100 100 100 100 64 64 65 67 67 67 67 67 67 67		Max																
122 123 123 123 124 146 100 100 100 100 64 64 65 65 65 65 65 65	Heat Control Lot																	
122 122 123 123 123 124 145 151 146 100	175147 030003140032		122	123	123			123	100	100	100			100	64	64	65	29
144 142 151 151 146 100 100 100 100 79 79 66 Expansion:	175724 030003140031		122	122	122			122	100	100	100			100	64	64	67	1.9
Direction: Transverse Temperature: 46°C SA3 SA4 SA5 SAAVg LE1 LE2 LE3 AE1 AE2 AE3 AE4 AE5 AEAVg SA1 SA3 SA4 SA5 SAAVg LE1 LE2 LE3 Ja	178322 030003155671		144	142	151			146	100	100	100			100	62	79	99	7.5
Direction: Transverse Temperature: -46°C Striker radius: 8 mm AE1	AE - Absorbed Energy; SA - Shear Area	t; LE - Lateral Expansion;																
Direction: Transverse Temperature; -46°C Striker radius: 8 mm AE1	Impact Test																	
AE1 AE2 AE3 AE4 AE5 AEAVB SA1 SA2 SA3 SA4 SA5 SAAVB LE1 LE2 LE3 (J) (J) (J) (J) (J) (J) (J) (J) (S) (SO	Test Specimen: CHARPY V 10X55X5 F	LATTENED	Direct	tion: Trans	verse			Tem	perature	J.98-			91	triker radiu	s: 8 mm			
(J)			AEI	AEZ	E3V	AE4	AES	AE AVE	SAI	SA2	5.43	SA4	SAS	SA Avg	LEI	LE2	LE3	LE AVE
Required: Min 14 14 14 50 50 50 60 Max Max 121 122 121 100 100 100 100 53 58 59 121 122 121 122 100 100 100 100 55 60 55 106 111 104 106 100 100 100 76 80 72			6	(2)	(3)	(5)	(1)	(3)	(%)	(%)	(%)	(%)	(%)	(%)	(Mills)	(Mills)	(Mils)	(Mils)
Max 121 121 122 120 100 100 100 100 53 58 59 121 122 121 106 100 100 100 55 60 55 106 111 104 106 100 100 100 76 80 72		Required: Min	14	E	14			14	50	50	9.0			09				
121 121 122 121 100 100 100 100 53 58 59 121 122 121 106 100 1		Max																
121 121 122 121 100 100 100 100 53 58 59 121 122 121 122 100 100 100 100 100 55 60 55 100 100 100 100 76 80 72 121 122 123 124 124 125 1	Heat Control Lot																	
121 122 121 122 100 100 100 100 55 60 55 100 100 100 100 76 80 72	175147 030003140032		121	121	122			121	100	100	100			100	53	58	65	19
106 111 104 106 100 100 100 100 76 80 72	175724 030003140031		121	122	121			122	100	100	100			100	55	09	55	89
	178322 030003155671		901	111	104			901	100	100	100			100	92	80	7.7	2/6





RINA

Inspection Certificate (According to DIN EN 10204 3.1)

Nº .: 0030032296 / 00

Sheet, 4 / 4

Remarks:

1 MATERIAL IN ACCORDANCE WITH NACE MR 0175 PAR. 3 2/ISO 15156-2, ANNEX A.2.I.2/NACE MR0103 PAR.2.I. ALL LATEST EDITIONS

2. SKU 2530104

3. THE WORKS OPERATE A QUALITY MANAGEMENT SYSTEM ACCORDING TO EUROPEAN DIRECTIVE 2014/68/UE ANNEX 1 PAR, 4.3 (CERTIFICATE 2016 BH MP 02-03 VALID UNTIL 12.05 2019).

- MATERIAL ACCORDING TO PED 2014/68/UE ANNEX LPAR, 7.5

4. - NO WELD REPAIR

- FREE OF MERCURY CONTAMINATION

- NO RADIOACTIVE CONTAMINATION

- FINE GRAIN PRACTICE

- FULLY KILLED STEEL

- MATERIAL FROM BRAZIL

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

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

e-mall:luiz-silva@vallourec.com

is valid without signature. Alteration or use for others products are regarded as falsification of satisfactory. This testimonial and certificate respectively is recorded by a computer system and

documents and will be subject to criminal jurisdiction.

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

TECHNICAL A ENG. LUIZ FERNANDO DA

02.27.2019

DATE



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



Inspection Certificate (According to DIN EN 10204.3.1) No.: 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 DEC. , NORMALIZED DIMENSIONS: 168,30 mm X 7,11 mm GRADE: GRADE: GRADE 290 ± GR 1 # 6 # B

STANDARD: CSA-Z245.1-18 - CATEGORY II

570 23

2530104

IN ACCORDANCE ALSO TO THE STANDARDS: ASTM A 333M - 18 ASTM A 999M - 18 # ASTM A 530M - 18

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 nm /+1,26 nm WALL THICKNESS: -0,89 nm/+1,07 nm

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-2245.1-18 168,30 X 7,11 290 CAT 11 M46C SS S HN LENGTH HEAT NUMBER ASTM A/ASME SA 333, 1/6 HF SCH D40 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	86	
Total	124	

THE PRODUCT IS SATISFACTORY IN THE FOLLOWING TESTS / INSPECTIONS: DIMENSIONAL # FLATTEMING TEST # ENDS INSPECTION: UNTESTED ENDS CROPPED # HYDROSTATIC TEST: 18400.0 KPA 5.5 # RESIDUAL MAGNETISM: MAX 30 GAUSS # ELECTROMAGNETIC TEST - CSAZ245.1-N10.100/TRAN, OUT/INS # ULTRASONIC TEST FOR LAMINAR DEFECTS: ACC. CSA Z245.1-SOUR SERVICE #





Controller 69						EcoTube	pe	1		RINA	-	1				Inspe	ction (Inspection Certificate	
Valiourec									(4)	MG 1901 150/13/14/4* 150 14801 150 50001 CHEAR 1800 Code: (Vigney med 70/0* to	SAMP SAMP SHEAN	188		No.: 0((According No.: 0030032296 / 00	(Accord)	OB to DIN	(According to DIN EN 10204.3.1)	Sheer: 7.4
Chemical Composition (%)	•				Proce	ss: Basic	Process; Basic Oxygen Furnace, heats fully killed	urnace, l	cats fully	killed									
Ceq: CSA-Z245.1-CE11					Ceq: CIN	fn/6+(Cr+	Ceq: C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15	(Ni+Cu	115	0	EL: Cr+	Cu + Me	CEL Cr + Cu + Ma + Nt + V						
	U	Mn	0.	T.	15	Ž.	J.	Mo	V	Cu	>	386	B 1	TI N	C	Ceq	Crq	CEI	
Heat Analisys Min		0,400	0		0,100														
Max	0,240	0 1,350		0,025 0,025	005'0 5	0,400	0.300	0,120		0,400 0	0.080 0	0,020 0,	0,0010 0,110	10		0.400	0,430	000'1	
Product Analisys Min		0.400	0		001.00														
Max	κ 0.240	0 1.350	0 0.025	25 0.025	005'0 5	0.400	0300	0,120		0,400 0	0,080	0,020 0.	0.0010 0.1	0.110		0,400	0,430	000'1	
Heat Control Lot																			
175147 030003127653	0,12	131		0,010 0,007	05'0 4	0.01	0,04	0,01	0,027	0,025 0	0,004 0	0'016 0,	0,0004 0,0	0,003 0,0055	55 0,0013	3 0,309	0.351	0,0%4	
Check I	0,12	(.29	010'0	10 0,005	0,29	10'0	0,04	0.01	0,028	0,024 0	0.004 0	0,017 0,	0,00002 0,0	0,003 0,0050	50 0.0011	1 0,309	0,348	8300	
Check 2	0,12	1,29	010'0 0	10 0.006	06 0,28	10'0	D,04	10,0	0,027	0,023 0	0,004 0	0,016 0,	0,00002 0,0	0,002 0,0050	50 0.0012	2 0,308	0.347	0,0%6	
175724 030003127905	0.11	1,30	600'0 (99 0,003	(0,30)	0.02	0.05	0.01	0.029	0,030 0	0,004 0	0.015 0.	0.0004 0.0	0.002 0,0045	45 0,0015	5 0,284	0,347	0,115	
Check 1	0,13	131	60000	200,0 00	0,29	0.02	0.05	0.01	0,031	0,029 0	0.004 0	0.016 0.	0.0002 0.0	0.002 0.0050	50 0,0013	3 0.285	0,346	0,116	
Check 2	0,11	1.32	600,00	09 0.002	12 0,28	0.02	0,05	10'0	0,030	0,029 0	0.003 0	0,016 0,	0,00002 0,0	0,002 0,0050	50 0,0013	3 0,287	0.346	0,115	
178322 030003155671	0,10	1,28	1 0,012	12 0,003	3 0,29	0,04	90'0	0,02	0,028	0,080,0	0,004 0	0 9100	0,0004 0,002	1700,0 20	2100,0 17	5 0,267	0,348	0,201	
Check 1	0,10	1,29	0.013	13 0,003	3 0,29	0.04	90'0	0.02	0,030	0,083 0	0,002 0	0.017 0,	0,0002 0,002	02 0,0071	71 0.0014	4 0,269	0,350	761.0	
Check 2	0,10) (,27	110.0	1) 0,004	0,30	0,04	90'0	0,02	0.029	0.082 0	0,004 0	0,015 0,	0,0002 0,003	03 0,0075	75 0,0013	3 0,267	0.347	0,203	
Ceq: Carbon Equivalent; Ceq: Carbon Equivalent; CE: Combined Elements;	Carbon Equiv	alent; C	E: Con	hined E	entents;												١		
Tensile Test																			
Specimen Direction; Longitudinal					Tempera	ore: Roo	Temperature: Room Temperature	fure		11	all Thic	Wall Thickness: 7,11 mm	11 mm			3	uge Leng	Gauge Length: L0=2"	
Method: Elong. Total Under Load 0,50 %	% 05'01																		
						Type	Type of Specimen	g.		Area	Cit.	YS		TS		ы			
										(MMZ)	12)	(MPA)	2	(MPA)		(%)			
		Re	Required: Min	Min								290		415		33			
				Mar										625					
Heat Control Lot																			
175147 030603140032						STRIP W	STRIP WIDTH 25,4 MM	MW.		188,5	5	376		500		40			
						STRIP W	STRIP WIDTH 25,4 MM	MM t		190.0	0.	382		505		40			
175724 030003127905						STRIP W	STRIP WIDTH 25,4	MM		188.8	oq.	371		486		39			
						STRIP W	STRIP WIDTH 25,4	MM I		186,2	.7	369		200		3.9			
030003140031						STRIP W	STRIP WIDTH 25,4	MM 1		188.8	or.	370		489		39			
						STRIP W	STRIP WIDTH 25,4 MM	MM t		189,2	Di	373		492		40			
178322 030003155671						STRIP W	STRIP WIDTH 25,4 MM	MM 1		186,5	vi	355		488		39			
						STRIP W	STRIP WIDTH 25,4 MM	MW 1		185,9	6	360		492		40			
VS-Yield Strength; TS-Tensile Strength; E-Elongation;	trength; E-Elo	ngation					Sh												





Inspection Certificate (According to DIN EN 10204.3.1) No.: 0030032296 / 00

Sheer 3 / 4

est	
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25	
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Scale: HV

Mas

156.0 0,701 167,0 143.0 Max 246,0 156.11 0,591 163.0 143,0 Required: Min 178322 030003155671 175147 030003140032 175724 (130003127905 030003140031 Heat Control Lot

Impact Test																	
Test Specimen: CHARPY 10X55X5 V NOTCH		Direct	ion: Longi	tudinal			Ter	nperatur	e: -53°C			41	Briker radiu	as: 8 mm			
		AEI	AE2	AE3	AE4	AES	AE Avg	SAI	SAZ		SA4	SVS	SA AVE	LEI	L.E.2	LE3	LE AVE
		(3)	(3)	(4) (5) (5)	(3)	6	(1)	(%)	(J) (%) (%)	(%)	(%)	(%)	(%) (%ills) (%	(Mills)	(Mils)	(Mils)	(Mils)
	Required: Min 14	4	#1	14			14	20	50				09				
	Max																
Heat Control Lot																	
175147 030003140032		122	123	123			(23	100	100	001			100	64	64	65	19
175724 030003140031		122	122	122			122	100	100	100			100	64	64	67	67
178322 030003155671		144	142	151			146	100	100	100			100	62	-62	99	75
AE - Absorbed Energy; SA - Shear Area; LE - Lateral Expansion;	Lateral Expansion;																
Impact Test																	

Test Specimen: CHARPY V 10X55X5 FLATTENED		Directi	Direction: Transv	crsc			Tem	oerafure:	246°C			55	riker radiu	ж 8 тып			
		AEI	AE2	AE3			AE AVE	SAI	SA2	SA3	SA4	SA5	SA AVE	LEI		LE3	LE Avg
		(1)	(3)	(1)	(2)	6	(%) (%) (f)	(%)	(%)	(%)	(%)	(%)	(%) (%) (Mils)	(Mils)	(Mills)	(MHs)	(MHs)
2	Required: Min 14	14	14	14			14	20	50	20			09				
	Max																
Heat Control Lot																	
175147 030003140032		121	121	122			121	100	100	100			100	53	38	969	64
175724 030003140031		121	122	121			122	001	100	100			100	55	09	55	89
178322 030003155671		100	010	184			901	100	100	100			100	9/	08	772	2/2
AE - Absorbed Energy; SA - Shear Area; U.E - Lateral Expansion;	al Expansion;																





RINA

Inspection Certificate (According to DIN EN 10204.3.1)

Nº .: 0030032296 / 00

Sheet 4 / 4

Remarks:

1. MATERIAL IN ACCORDANCE WITH NACE MR 0175 PAR 3.1/ISO 15156-2, ANNEX A 2.1.27NACE MINI 103 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 LPAR, 4.3 (CERTIFICATE 2016 BH MP 02-03 VALID UNTIL 12,05, 2019)

- MATERIAL ACCORDING TO PED 2014/68/UE ANNEX 1 PAR 7.5

4. - NO WELD REPAIR.

- FREE OF MERCURY CONTAMINATION

- NO RADIOACTIVE CONTAMINATION

- FINE GRAIN PRACTICE

- FULLY KILLED STEEL

- MATERIAL FROM BRAZIL

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

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

e-mail:fuir.silva(a)vallourec.com

02,27,2019 DATE

is valid without signature. Alleration or use for others products are regarded as falsification of satisfactory. This testimonial and certificate respectively is recorded by a computer system and 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 documents and will be subject to criminal jurisdiction.

TECHNICAL MESPONSIBLE ENG. LUIZ FERNANDO DA

vallourec

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



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: Vallource 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 STANDARD: CSA-2245,1-14 - CATEGORY II

2530112

570

00

IN ACCORDANCE ALSO TO THE STANDARDS: ASTM A 333M - 16 ASTM A 999M - 18 # ASTM A 106M - 18 ASTM A 530M - 12 # ASMESA-333M - 17 ASMESA-106M - 18 530M-17

CUSTOMER SPECIFICATION: CCTF GrB.L.6.290 Cat JI 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 STENCELED IN THE PIPE BODY: 531796/50 MANUFACTURER CSA-Z245.1-14 219,10 X 8,18 290 CAT II SS S I'N LENGTH HEAT NUMBER ASTM A/ASME SA 333, 1/6 HF SCH 040 LT -46C ASTM AVASME 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

Pieces	10	90	28	47
Heat	175141	175142	176433	Total

THE PRODUCT IS SATISFACTORY IN THE FOLLOWING TESTS / INSPECTIONS: DIMENSIONAL # VISUAL # FLATTENING TEST # ENDS INSPECTION: UNTESTED ENDS CROPPED # HYDROSTATIC TEST; 16300,0 KFA 5.5 # 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 #





Inspection Certificate

▼ vallourec						Ecolube	8		() () () () () () () () () ()	RINA BO NOT BO/21 (1849) SO MAN SO SERVITO CONTRACTINGUES OF TAXABLE SA	IA 150 zanii osida tene orogenesi žetene	9		0 :: oN	03003	Inspect (According N°.; 0030030841 / 00	ing to DB	Inspection Certificate (According to DIN EN 10204.3.1) 341 / 00	Sheet.2 / 4
Chemical Composition (%)					Process	Basic 0	xygen Fi	Process: Basic Oxygen Furnace, heats fully killed	sats fully										
Ceq: CSA-Z245,1-CE11				Cen	C+Mn/	0+(Cr+N	to+V)/5	Ckq; C+Mn/6+(Cr+M0+V)/5 -(N)+Cu)/15	15	0	El: Cr+	Cu + Mo	CEI: Cr + Cu + Mo + Ni + V						
	O	Min	D.	un.	S	ž	C	Mo	N1	Cu	^	Nb	B. I	T N	2	Ceq	Ced	CE1	
Heat Analisys		0,400			001'0														
Max	0.240	1,350	0,025	0,025	0,500	0,400	0,300	0,120		0,400	0,080 0	0,020 0,0	0,0010 0,1	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,	0,0010 0,1	0,110		0,400	0.430	1,000	
Heat Control Lot																			
175141 030003103023	01'0	1,28	600'0	0,003	0,27	0,02	50'0	10'0	0,026	0,028	0 (00'0	0,016 0,	0,00005 0,0	0,001 0,00	6100'0 0200'0	19 0,262	0,329	0,109	
Check I	0,10	1,26	800'0	0,003	0,28	0,02	0.04	(0,0	0,026	0,030	0,004 0	0,015 0,0	0,00003 0,0	0,001 0,00	0,0065 0,0016	16 0,258	0,324	0,104	
Check 2	0,11	1,28	800'0	0,002	0,28	0,02	0,04	10'0	0,026	0,031	0,004 0	0,016 0,	0,0002 0,0	0,001 0,00	9100'0 5900'0	16 0,270	0,338	0,105	
175142 030003103024	0,11	1,29	010'0	0,004	0,28	0,02	0,05	10'0	0,030	0,025 (0,001	0,015 0,0	0,0004 0,0	0,002 0,00	9100,0 7700,0	16 0.283	0,340	901'0	
Check 1	0,11	1,28	0,011	0,003	0,28	0,03	90'0	10'0	0,031	0,021	0,005 0	0,016 0,	0,00003 0,0	0,002 0,00	0,0072 0,0013	13 0,283	0,342	0,126	
Check 2	0,11	1,29	600'0	0,003	0,28	0,02	0.04	10'0	0,029	0,025 (0,004 0	0,015 0,0	0,00003 0,0	0,002 0,00	0,0075 0,0014	14 0,281	0,339	660'0	
176433 030003103452	0,10	1,27	0,012	0,004	0,28	0,03	90'0	10'0	670'0	0,070	0,004 0	0,015 0,	0,0004 0,0	0,002 0,00	21000 66000	12 0,265	0,333	0,174	
Check 1	0,11	1,29	0,013	0,004	0,29	0,03	90'0	10'0	0,028	990'0	0,000,0	0,016 0,	0,00003 0,0	0,002 0,00	0,0096 0,0013	13 0,277	0,346	0,171	
Check 2	0,11	1,26	0,013	0,004	0,28	60,03	90'0	10'0	0,028	990'0	0 500'0	0,016 0,	0,0002 0,0	0,002 0,00	0,0096 0,0013	13 0,273	0,341	0,171	
Ceg: Carbon Equivalent; Ceg: Carbon Equivalent; CE: Combined Elements;	in Equival	ent; CE:	Combin	ed Elem	ents;											1			
Tensile Test																			
Specimen Direction: Longitudinal				Ten	Temperature: Room Temperature	е; Кооп	Тепрега	ture		2	Vall Thic	Wall Thickness: 8,18 mm	18 mm				age Leng	Gage Length: L0=2"	
Method: Elong. Total Under Load 0,50 %	5/0																		
						Type of	Type of Specimen	и		Ar	Area	YS		TS		田			
										(M)	(MM2)	(MPA)	()	(MPA)		(%)			
		Requi	Required: Min									290		415		35			
			Max	12								495		625					
Hear Control Lot																			
175141 030003103023					00	STRIP WIDTH 38,1 MM	DTH 38,	MM		33	336,8	360		472		4)			
					c/a	STRIP WIDTH 38,1 MM	DTH 38,	MM		34	348,7	389		455		40			
175142 030003103024					t/s	STRIP WIDTH 38,1 MM	DTH 38,	MM		318	318,9	395		502		42			
					to	STRIP WIDTH 38,1 MM	DTH 38,	MM		330,1	1,1	401		490		40			
176433 030003103452					6/1	STRIP WIDTH 38,1 MM	DTH 38,	MM		321	328,0	396		208		43			
					S	STRIP WIDTH 38,1 MM	DIH 38,	MM		34	341,8	410		495		40			
YS-Yield Strength; TS-Teusile Strength; E-Elongation;	h; E-Elon	gation;							1	1				1					





SQ 9031 TQ/S114/41 TQ 14001 FQ 50001 OyEAL 14001 Cwifeell (Grospminn Nydems

RINA

Inspection Certificate (According to DIN EN 10204.3.1)

Nº .: 0030030841 / 00

Sheet:3 / 4

Hardness Test

Scale: HV

Max Required: Min

246,0 Max

170,0

160,0 164,0

162,0 158,0

LE Avg (Mils) 75 80 (Mils) LE3 75 80 (Mills) LE2 22 80 (Milk) LEI Striker radius: 8 mm 22 88 80 SA Avg (%) 09 100 100 SA5 (%) SA4 (%) SA3 (%) 50 100 100 100 SA2 (%) 50 100 100 100 Temperature: 46°C SAI (%) 20 00 00 8 AEAVB 6 264 264 AES 5 AE4 5 A E3 255 3 3 245 261 Direction: Longitudinal AE2 5 267 264 AEI 8 270 267 Required: Min Max Test Specimen: CHARPY 10X55X7.5 V NOTCH 175141 030003103023 175142 030003103024 176433 030003103452 Heat Control Lot Impact Test

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

Test Specimen: CHARPY 10X55X6,67 V NOTCH

AE4 5 AE3 3 213 Direction: Transverse AE2 5 90 208 AE 5 196 Required: Min Max 175141 030003103023 Heat Control Lot

LE AVB

LE3

(MIIIs)

(Mills)

(Milk) LEZ

(Mils)

(%)

09

LE1

SA Avg

SA5 (%)

SA4

SA3

SAZ (%)

SAI (%)

AE AVE

AE5

5 00

5

Temperature: -46°C

(%)

3

90

Striker radius: 8 mm

82 80

81 82 78

78 82 88

8 82 80

100

100 80 10

00

00

206 190 168

100

100

187

179

203

156

100

100

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

PAR. 3.2/ISO 15/56-2, ANNEX A 2.1.2/NACE MR0103 PAR. 2.1. A11, LATEST 1. MATERIAL IN ACCORDANCE WITH NACE MR 0175





Inspection Certificate (According to DIN EN 10204.3.1) No.: 0030030841 / 00

Sheet'4/4

EDITIONS

2, SKU 2530112

3. THE WORKS OPERATE A QUALITY MANAGEMENT SYSTEM ACCORDING TO BUROPEAN DIRECTIVE 2014/68/UE ANNEX | PAR. 4.3 (CERTIFICATE 2016 BH MP 02-03

VALID UNTIL 12.05,2019).

- MATERIAL ACCORDING TO PED 2014/68/UE ANNEX 1 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

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

e-mail:luis.silva@yalfourec.com

TECHNICAL NG. LUIZ FERNANDO D

11.20.2018 DATE

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 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 documents and will be subject to criminal jurisdiction.

vallourec

Vallource Soluções Tübulares do Brasil S.A. Barceiro Plant - Av. Olínto Meireles, 65 ZIP 306-0-010 - Belo Horzonte, MG



Inspection Certificate (According to DIN IN 10304.3.1)
No.: 0030031810 / 00

Sheet, 1-4

Customers VALLORBEC CANADA INC

Country: Camada

Material Number: 274624
Work Order; 534782 180
Customer Order; VN-4748 - FO 4038825-00

Inspection: Vallance Soluções Tubulans do Brisil S.A.

PRODUCT: SEAMLESS STEEL PIPE, HOT FINISHED. BEVELED ENDS 30 DEG., NORMALIZED DIMERSIONS; 219,10 mm N 8,18 mm SCHEDULE; 640 GRADE; GRADE; 290 # GR 1 # 6 # B STANDARD; CSA-Z245,1-18 - CATEGORY II

IN ACCORDANCE ALSO TO THE STANDARDS; ASTM A 3330; - 16 ASTM A 909M - 18 #ASTM A 106M - 17 ASME SA 930M - 17 #ASME SA 999M - 18 #ASME SA 999M - 18

50 2530112

00

CUSTOMER SPECIFICATION: CCFF GrB.L.6.290 Carti SS., 20.11.2017

SUBFACE PROTECTION: EXTERNAL LACQUIR PIPE ENDS PROTECTOR: PLASTIC CAP

TOLERANCES: OUTSIDE DIAMETER (PIPE RODY); -0.80 mm VALL THICKNI/SN: -1,02 mm / -1,23 mm

TOLERANCES(PIPE ENDS); OUTSIDE DIAMETER: -0,40 mm / +1,50 mm

LENGTH: RANDOM 5486,00 mm - 6706,00 mm

STANDARD MARKING: PAINT STENCLED IN THE PIPE BODY: 534782 NO MANUFACTURER CSA-2245.1-18 219,10 X 8.18 290 CAT II MIAGC 55.5 UN LENGTH HEAT NOMBER ASTM A ASMENA 333, 1 6 HF SCH 040 LT -46C ASTM A/ASME SA 106 D 16300 KPA WEIGHT ASTM A 53 B NPS 8" X SCH 40 VSB LOGO

SHIPPING MARKING: NACE MR 0175/NACE MR 0103+ MADIEIN HRAZIL, * YM4748 / P.O.# 4038825-00011EM-8 * TORONTO * CCTIF

Hiccos	12	3(1	4.5
Heat	173)46	177833	Form

THE PRODUCT ISSATISFACTORY IN THE FOLLOWING TESTS CHOOSE DIMERSIONAL # FLATTENING TEST # ENDS INSPICTION; UNITESTED ENDS CROPPED # HYPRICOSTATIC TEST TO A 300.0 KPA 58 # RESIDOAL MAGNETEN: MAN 30 GAUSS # ELLIC TROMAGNETIC TEST: CSAZ2451-N10LONTRAN. OF TINS # ULFRASONIC TEST FOR LAMBAR DEFECTS: ACC., CSA Z245:1-SOL9R SERVICE =





Inspection Certificate (According to DIN EN 10204.3.1) Nº.: 0030031810 / 00

Chemical Composition (%)

Process: Basic Oxygen Furnace, heats fully killed

Color Colo	٤	150	٥	ق ر	Ceq; (-:Mn/6+(Cr-M0+V)/S +(Ni+Cu)/15	P-CT-N	0+V)5-	(Ni-Cu)	51	S - 5	El:Cr-	CE1: Cr - Cu + Mo + Ni + V	> : Z +		ć	Çee	Cea	13.)
0.3400 0.2400 0.	U	NE.	2	v.	<i>ī</i> .	Ž.	ב	9.	2	= 5			=======================================	Z.	ij	<u>=</u>	500	
0.240 1.350 0.025 0.025 0.026 0.5400 0.4100 0.300 0.120 0.40		0,400			0.100													
0.340 0.025 0.025 0.025 0.026 0.020 0.020 0.020 0.020 0.020 0.0010 0.110 0.020 0.0	0.240			0.025	0.500	0.400		0.120						9		0.400	0.430	1,000
0.11		0.400			0.100													
0,11 1,29 0,010 0,004 0,29 0,01 0,044 0,01 0,022 0,004 0,015 0,004 0,005 0,007 0,001 0,005 0,01 0,005 0,01 0,005 0,01 0,005 0,01 0,005 0,01 0,005 0,01 0,005 0,01 0,005 0,01 0,005 0,01 0,005 0,005 0,005 0,005 0,005 0,007 0,001 0,005 0,	0.240			0.025	0.500			0,120)				0.10	01		0.400	0,430	1,000
0.11 1.29 0.010 0.004 0.02 0.004 0.015 0.0004 0.0015 0.0004 0.0015 0.0004 0.0015 0.0004 0.0015 0.0005 0.0005																		
0.11	0,11	1.29	0.010		0.29	10,0	0.04								1 0,0012		0.338	0,0%6
0.11	0,11	1,29	0.010		0.30	0.01	0.05								7 0,0012		0,340	0,097
0.11 1.28 0.011 0.003 0.27 0.03 0.07 0.01 0.030 0.009 0.003 0.015 0.002 0.006 0.000	0.11	1.30	0,000		0,31	0,01	0.04								0.0014		0,339	0.084
0,10 1,28 0,011 0,003 0,27 0,03 0,007 0,01 0,030 0,003 0,015 0,0002 0,0004 0,0018 0,22	0.11	92.1	0,010		0.28	0.03	0.07								7 0,0018		0,350	0,20-4
0,10 1,28 0,011 0,1003 0,27 0,03 0,107 0,010 0,0000 0,0003 0,0115 0,0005 0,00067 0,0016 0,22 Equivalent: CE: Combined Elements: Type of Specimen	0,11	1.28	0.011		0.27	0.03	0.07								4 0,0018		0.348	0,203
Equivalent: CE: Combined Elements: Wall Thickness: 8.18 mm FE Type of Specimen Area VS TS E (AIM2) (AIM2) (AIPA) (AIPA) (AIPA) Required: Min 290 415 35 Max 495 625 41 STRIP WIDTH 38 MM 329.7 399 512 40 STRIP WIDTH 38.1 MM 305.2 420 519 42 STRIP WIDTH 38.1 MM 306.7 425 525 40	0.10		0.011	0,003	0,27	0,03	50.0								0,0016		0.338	0.203
Temperature Room Temperature Wall Thickness: 8.18 mm Area VS TS E Type of Specimen Area VS TS E AMI2 (AIPA) (AIPA) (AIPA) (AIPA) AB4 AB5 AB5 AB5 AB5 STRIP WIDTH 38 MM 329.7 399 515 40 STRIP WIDTH 38.1 MM 305.2 420 519 42 STRIP WIDTH 38.1 MM 305.7 425 525 40 STRIP WIDTH 38.1 MM 305.7 425 525 40 STRIP WIDTH 38.1 MM 306.7 425 525 40 STRIP WIDTH 38.1 MM 326.7 426	hon Equiva	lent: CE:	Combin	red Elem	ents:													
Temperature: Room Temperature Wall Thickness: 8.18 mm																		
Type of Specimen Area VS TS				Ten	nperatur	e: Room	Temperat	ture		-	Vall Thic	kness: 8.1	S mm			Ē	uge Leng	th: 1.0-2"
Type of Specimen Area YS TS (AIM2) (AIPA) (AIPA) 290 415 495 425 625 625 STRIP WIDTH 38 MM 324,3 383 502 STRIP WIDTH 38,1 MM 329,7 399 - 515 STRIP WIDTH 38,1 MM 305,2 420 519 STRIP WIDTH 38,1 MM 306,7 425 525	Method:Blong,Total Under Load 0,50 %																	
(MMZ)						Type of	Specime	_		Ar	ea.	VS		ES	_	*,1		
290 415 495 625 STRIP WIDTH 38 MM 329,7 399 519 STRIP WIDTH 38.1 MM 305,2 420 519 STRIP WIDTH 38.1 MM 306,7 425 525										(SE	(12)	Valle)	-	(MPA)	Û	(9)		
STRIP WIDTH 38 MM 329.7 383 502 STRIP WIDTH 38 MM 339.7 399 515 STRIP WIDTH 38.1 MM 306.7 420 519		Requ	ired: Mi	u								290		415	rc	15.		
329,7 389 502 329,7 399 , 515 305,2 420 519 300,7 425 525			Ma	,								405		625				
329,7 399 512 305,2 420 519 306,7 425 525																		
329,7 399 , 515 305,2 420 519 300,7 425 525					<i>S</i> C	TRIPW	DTH 38	MM		2	<u></u>	383		505	7			
305,2 420 519 300,7 425 525					S.C.	TRIP W	10111138	MM		32	7.6	300		515	7	c		
300,7 425 525					S.	TRIP WIL	3111 38,1	MM		30.	5.2	420		510	*1	LI		
					5	TRIP WIL	YFH 38.1	NN		300	7,0	425		525	7	0		





Inspection Certificate (According to DIN EN 10204.3.1) Nº .: 0030031810 / 00

Sheet:3 4

Hardness Test

Seale: HV

Required: Win

Mac

Max 246,0

135.0 132,01 177833 030003140903

150.0

148,0

17514c 030003113164

Heat. Control Lot

Impact Test		1	The second				Contract of the Contract of th		1000								
Test Specimen: CHARPY 10X55X75 V NOTCH		Direct	Direction: Longitudinal	ndinal			Len	Temperature: -16°C	2591			F.	Striker radius: 8 mm	St S mm			
		MEI	AE2	AEA	A1.4	(ES	AE AVE		SA2	KAN	77.7	8.4.5	S.A. Avg.	137	1,152	CER	LE AVE
		(5)	(1)	(1)	(1)	CII	(1)	(%)	(%)	(2%)	(%)	(%)		(MIIN)	(SHIS)	(MIIN)	(Mills)
	Required: Min 21	<u>~</u>	FI	23			Fi	20	50	20			00				
	Man																
Heat Control Lot																	
175146 030003113164		270	275	292			692	100	1001	100			1001	7.8	-18	80	80
177833 030003140903		275	363	270			692	100	100	100			100	71	70	69	7.3
AE - Absorbed Energy: S.A - Shear Aren: L.E - Lateral Expansion:	iteral Expansion:																
Impact Test																	
Test Specimen: CHARPY 10X35X6.67 V NOTCH		Direct	Direction: Iransverse	CTSC			Tem	Temperature: 40%	2695			15	Striker radiust 8 mm	81.8 mm			
		AEI	AE2	AE3	AE4	VES	AE AVR	SAL	SAZ	SA3	5,74	5.N.S.	SA AVE	LEI	1.62	1.153	LE AVE
		(7)	(7)	(1)	(1)	(1)	(7)	(%)	(%)	(%)	(%)	(%)	(%)	(Mils)	(Milk)	(Mills)	(Mills)
	Required: Min	×	13	×			18	20	90	11/5			100				
	Max																
Heat Cantrol Lot																	
177833 030003140903		230	186	77			0.1	001	100	100			100	× ×	87	SK	SS
AE - Absorbed Fourier SA - Stear Area: LE - Lateral Expansions	deral Expansions																

Remarks

PAR, 3.2/ISO 13136-2, AWNEX A.2.1.2/NACE MR0103 PAR.2.1, ALL LATEST LIMATERIAL IN ACCORDANCE WITH NACE MR 0175

EDITIONS

2, SKU 2530112

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





Inspection Certificate (According to DIN I,N 10204.3.1) Nº.: 0030031810 / 00

Sheered 4

DRRECTIVE 2014/68/201 AINNEX FERE, 4.3 (CTRETPICATE 2016/BH MP 02-03 VALID UNTIL 12.05.2019).

- MATIGUAL ACCORDING TO PRE 2014 68 UP ANNEX UPAIL 7.3

2 - NO WELD REPAIR

- FREE OF MURCURY CONFAMINATION

- NO RADIOACTIVE CONTAMINATION

- FINE GRAIN PRACTICE

- FULLY KILLED STEEL.

- MATERIAL FROM BRAZIL

QUALITY CONTROL DEPARTMENT FAN: (55-31) 3328-2773 We hereby certify that this product has been manufactured and examined in accordance with

e-maithlifesitea a raffmy ecanii

satisfactory. This testimonial and certificate respectively is recorded by a computer system and is calid without signature. Alteration or use for others products are regarded as EastReation of

documents and will be subject to criminal jurisdiction.

all requirements of the standards and specifications and all the results are found to be

TECHNICAL AUSTONSIGLE NG LUIZ FERNANDO DA

01.32.2019 DATE



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



Ortal (600) buters RINA

Inspection Certificate (According to DIN EN 10204.3.1)

N°.: 0030030841 / 00

Customer: VALLOUREC CANADA INC.

Country; Canada

Customer Order: VM-4682 - P O 4038589-(10 Material Number: 274465 Work Order: 531796 / 50

Inspection: Vallouree 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

IN ACCORDANCE ALSO TO THE STANDARDS: ASTM A 333M - 16 ASTM A 999M - 18 #ASTM A 106M - 12 # ASTM A 530M - 12 # ASTM A 530M - 12 # ASME SA -333M - 17 ASME SA 999M - 17 # ASME SA -106M - 17 ASME SA -106M - 17 ASME SA -106M - 17 ASME SA -106M - 18 ASTM A 530M - 12 # ASTM A 530M - 12 # ASME SA -333M - 17 ASME SA -106M - 18 ASTM A 530M - 12 # ASTM A 530M - 12 # ASME SA -333M - 17 ASME SA -106M - 18 ASTM A 530M - 12 # ASME SA -3331M - 17 ASME SA -3331M - 17 ASME SA -3331M - 17 ASME SA -3331M - 18 ASTM A 530M - 18 ASTM 2530112 STANDARD: CSA-Z245,1-14 - CATEGORY II

STO

00

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(FIPE ENDS): OUTSIDE DIAMETER: -0,40 mm / +1,60 mm

LENGTH: RANDOM 5486,00 mm - 6706,00 mm

STANDARD MARKING: PAINT STENCELED IN THE PIPE BODY: 531796/50 MANUFACTURER CSA-ZZ45.1-14 219,10 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 AJASME 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

Pieces	90	50	28	42
Heat	175141	175142	176433	Torol

THE PRODUCT IS SATISFACTORY IN THE FOLLOWING TESTS / INSPECTIONS: DIMENSIONAL # FLATTENING TEST # ENDS INSPECTION: UNTESTED ENDS CROPPED # HYDROSTATIC TEST: (6300,0 KPA) 5.5 # RESIDUAL MAGNETISM: MAX 30 GAUSS # ELECTROMAGNETIC TEST: CSA2245.1-N10, LONTRAN, OUT/INS # ULTRASONIC TEST FOR LAMINAR DEFECTS: ACC. CSA 2245.1-SOUR SERVICE #





Chemical Composition (%) Ceq:Calcade-Nay Sequence, band table billed Nata Calcade, 1359 0,025 0,025 0,020 0,120 0,120 0,020 0,000 0,0	V vallourec							EcoTube			₩ 883	RINA BO 100 I 10 II 1 1 1 1 1 1 1 1 1 1 1 1 1 1	OHAL SOOT		S	Inspect (According N°.: 0030030841 / 00	(A 03084	rspect ccording	ion C	Inspection Certificate (According to DIN EN 10204.3.1)	Sheet/2/4
Control (%)																					
Min	Chemical Composition (%	(9)				2.	rocess: B	asic Oxy	gen Furz	ace, heats	fully kill	pel									
Ntin	Ceq: CSA-Z245.1-CE11					Ceq:	C+Mn/6+	(Cr+Mo	+V)/5 -(A	11+Cu)/15		CE1:	Cr + Cu +	Ma+Ni	> +						
Mink		9	-	/u	4	S							NB	20	I		Ü	Ceq	Ceq	CE1	
0.0,400 0,300 0,120 0,120 0,080 0,080 0,000 0,110 0,110 0,040 0,000 0,120 0,120 0,000 0,000 0,000 0,120 0,000 0,000 0,000 0,120 0,00		u	0	009		_	001"														
0.0 0,400 0,300 0,120 0,120 0,0120 0,003 0,001 0,110 0,004 0,000 0,004 0,000 0	Ma									120	0,40							0,400	0,430	1,000	
0,0 0,400 0,300 0,120 0,000 0																					
7 0,02 0,05 0,01 0,026 0,028 0,010 0,016 0,0005 0,001 0,0070 0,0019 0,2 8 0,02 0,04 0,01 0,026 0,031 0,004 0,015 0,0003 0,011 0,0065 0,0016 0,2 8 0,02 0,04 0,01 0,026 0,031 0,004 0,015 0,0003 0,010 0,0065 0,0016 0,2 8 0,02 0,04 0,01 0,026 0,031 0,003 0,015 0,0003 0,001 0,005 0,0016 0,2 8 0,02 0,04 0,01 0,026 0,031 0,021 0,005 0,016 0,0002 0,007 0,0014 0,2 8 0,03 0,06 0,01 0,031 0,021 0,004 0,015 0,0003 0,002 0,0013 0,2 8 0,03 0,06 0,01 0,032 0,004 0,015 0,0003 0,002 0,0013 0,2 8 0,03 0,06 0,01 0,028 0,066 0,005 0,016 0,0003 0,002 0,0013 0,2 8 0,03 0,06 0,01 0,028 0,066 0,005 0,016 0,0003 0,002 0,0013 0,2 8 0,03 0,06 0,01 0,028 0,066 0,005 0,015 0,0003 0,002 0,0013 0,2 8 0,03 0,06 0,01 0,028 0,066 0,005 0,016 0,0003 0,002 0,0013 0,2 8 0,03 0,06 0,01 0,028 0,066 0,005 0,015 0,0003 0,002 0,0013 0,2 8 0,03 0,06 0,01 0,028 0,066 0,005 0,015 0,0003 0,001 0,001 0,013 0,2 8 0,03 0,06 0,01 0,028 0,066 0,005 0,016 0,0002 0,000 0,001 0,001 0,010	Ma									120	0.40							0,400	0,430	00001	
1																					
8 0,02 0,04 0,01 0,026 0,031 0,004 0,015 0,0003 0,001 0,0066 0,0016 0,028 0,022 0,04 0,01 0,026 0,031 0,004 0,01 0,002 0,04 0,01 0,006 0,031 0,004 0,01 0,002 0,001 0,0016 0,028 0,002 0,001 0,003 0,002 0,001 0,003 0,001 0,003 0,002 0,001 0,001 0,001 0,003 0,002 0,001 0,001 0,001 0,003 0,002 0,001 0,001 0,003 0,002 0,001 0,003 0,002 0,001 0,003 0,003 0,003 0,001 0,003 0,003 0,003 0,001 0,003 0,0		Ö,														0,0070		0,262	0,329	0,109	
8 0,02 0,04 0,01 0,026 0,031 0,004 0,016 0,0002 0,001 0,0065 0,0016 0,028 0,022 0,032 0,001 0,031 0,032 0,001 0,003 0,002 0,001 0,003 0,002 0,001 0,003 0,002 0,001 0,003 0,002 0,001 0,003 0,003 0,003 0,003 0,001 0,003 0,003 0,003 0,001 0,003 0,003 0,003 0,001 0,003 0,00	Check I	0.															0,0016	0,258	0,324	0,104	
8 0,02 0,03 0,03 0,032 0,001 0,015 0,0004 0,002 0,0077 0,0016 0,028 0,03 0,03 0,002 0,0013 0,028 0,03 0,003 0,002 0,0013 0,028 0,03 0,003 0,003 0,002 0,0013 0,028 0,03 0,004 0,002 0,0003 0,0013 0,028 0,03 0,004 0,002 0,0003 0,0013 0,028 0,03 0,004 0,002 0,0003 0,0013 0,028 0,03 0,004 0,002 0,0003 0,0013 0,028 0,03 0,004 0,002 0,0003 0,0013 0,028 0,03 0,004 0,002 0,0003 0,0013 0,002 0,003 0,004 0,002 0,0013 0,002 0,003 0,004 0,002 0,0013 0,002 0,003 0,004 0,002 0,0013 0,002 0,003 0,004 0,002 0,0013 0,002 0,003 0,004 0,002 0,0013 0,002 0,003 0,004 0,002 0,0013 0,002 0,003 0,004 0,002 0,0013 0,002 0,003 0,004 0,002 0,0013 0,002 0,003 0,004 0,002 0,0013 0,002 0,003 0,004 0,002 0,0013 0,002 0,003 0,004 0,002 0,0013 0,002 0,003 0,004 0,002 0,0013 0,002 0,003 0,004 0,002 0,0013 0,002 0,003 0,004 0,002 0,004 0,003 0,004 0,00	Check 2	0,													0,001		0,0016	0,270	0,338	0,105	
8 0,03 0,06 0,01 0,031 0,025 0,005 0,016 0,0003 0,002 0,0072 0,0013 0,28 0,02 0,03 0,03 0,002 0,0072 0,0013 0,28 0,03 0,03 0,004 0,01 0,028 0,007 0,004 0,015 0,0003 0,002 0,0072 0,0013 0,29 0,03 0,06 0,01 0,028 0,007 0,006 0,016 0,002 0,0002 0,0002 0,0013 0,28 0,03 0,06 0,01 0,028 0,066 0,005 0,016 0,0002 0,0002 0,0009 0,0013 0,28 0,03 0,06 0,01 0,028 0,066 0,005 0,016 0,0002 0,0002 0,0009 0,0013 0,28 0,03 0,06 0,01 0,028 0,066 0,005 0,016 0,0002 0,0002 0,0009 0,0013 0,28 0,03 0,06 0,001 0,028 0,006 0,001 0,028 0,006 0,001 0,028 0,006 0,001 0,028 0,006 0,001 0,028 0,006 0,001 0,028 0,006 0,001 0,028 0,006 0,001 0,028 0,006 0,001 0,008 0,008 0,001 0,008 0,001 0,008 0,008 0,001 0,008 0,008 0,001 0,008		0													0,002		9100'0	0,283	0,340	0,106	
8 0.02 0,04 0,01 0,029 0,025 0,004 0,015 0,0004 0,002 0,0075 0,0014 0,2 8 0.03 0,06 0,01 0,028 0,066 0,005 0,016 0,002 0,009 0,0012 0,2 9 0,03 0,06 0,01 0,028 0,066 0,005 0,016 0,002 0,009 0,0013 0,2 8 0,03 0,06 0,01 0,028 0,066 0,005 0,016 0,0002 0,0002 0,0013 0,2 8 0,03 0,06 0,01 0,028 0,066 0,005 0,016 0,0002 0,0002 0,0013 0,2 8 0,03 0,06 0,01 0,028 0,066 0,005 0,016 0,0002 0,0002 0,0013 0,2 8 0,03 0,06 0,01 0,028 0,066 0,005 0,016 0,0002 0,0002 0,0013 0,2 8 0,03 0,06 0,01 0,028 0,066 0,005 0,016 0,0002 0,0002 0,0013 0,2 8 0,03 0,06 0,01 0,028 0,066 0,005 0,016 0,0003 0,002 0,0003 0,001 0,0	Check 1	0													0,002		0,0013	0,283	0,342	0,126	
8 0.03 0.06 0.01 0.022 0.000 0.001 0.02 0.002 0.002 0.002 0.001 0.02 0.003 0.002 0.001 0.02 0.003 0.002 0.002 0.001 0.02 0.003 0.002 0.001 0.02 0.003 0.002 0.001 0.02 0.003 0.002 0.001 0.02 0.003 0.002 0.001 0.02 0.003 0.002 0.001 0.02 0.001 0.02 0.001 0.002 0.001 0.003 0.002 0.001 0.003 0.002 0.001 0.003 0.002 0.001 0.003 0.002 0.001 0.003 0.002 0.001 0.003 0.002 0.001 0.003 0.002 0.001 0.003 0.002 0.001 0.003 0.002 0.001 0.003 0.002 0.001 0.003	Check 2	0													0,002		0,0014	0,281	0,339	660'0	
9 0,03 0,06 0,01 0,028 0,066 0,005 0,016 0,0002 0,002 0,0096 0,0013 0,2 8 0,03 0,06 0,01 0,028 0,066 0,005 0,016 0,0002 0,002 0,0096 0,0013 0,2 ature: Room Temperature Wall Thickness: 8,18 mm Area VS TS E WAM2) (MPA) (MPA) (%) STRIP WIDTH 38,1 MM STRIP W		0															0,0012	0,265	0,333	0,174	
8 0,03 0,06 0,018 0,066 0,005 0,016 0,002 0,0096 0,0013 0,2 ature: Room Temperature Wall Thickness: 8,18 mm TS E Type of Specimen Area VS TS E (MM2) (MM2) (MPA) (%) 290 415 35 495 625 415 35 STRIP WIDTH 38,1 MM 348,7 389 455 40 STRIP WIDTH 38,1 MM 318,9 395 502 42 STRIP WIDTH 38,1 MM 3330,1 401 490 40 STRIP WIDTH 38,1 MM 328,0 395 502 42 STRIP WIDTH 38,1 MM 328,0 396 508 43 STRIP WIDTH 38,1 MM 340,1 401 490 40 STRIP WIDTH 38,1 MM 340,1 401 490 40 STRIP WIDTH 38,1 MM 340,1 401 490 40 STRIP WIDTH 38,1 MM 340,0 40	Check I	0,														9600'0	0,0013	0,277	0,346	171,0	
Type of Specimen Area VS TS E (MM2) (MPA) (MPA) (%) 290 415 35 495 625 STRIP WIDTH 38,1 MM 338,7 389 455 40 STRIP WIDTH 38,1 MM 318,9 395 502 40 STRIP WIDTH 38,1 MM 318,9 396 502 40 STRIP WIDTH 38,1 MM 318,9 396 502 40 STRIP WIDTH 38,1 MM 318,9 396 508 43 STRIP WIDTH 38,1 MM 318,9 410 490 40	Check 2	0														9600'0	0,0013	0,273	0,341	171,0	
Temperature: Room Temperature Wall Thickness: 8,18 mm Type of Specimen	Ceq: Carbon Equivalent; Ceq:	Carbon Equ	ivalent	CE: C	ombine	d Elemen	(5;											1			
0,50 % Temperature: Room Temperature Wall Thickness: 8,18 mm TS E Required: Min (MMZ) (MPA) (MPA) (%) Max (MMZ) (MPA) (%) 35 Max STRIP WIDTH 38.1 MM 335,8 360 472 415 35 STRIP WIDTH 38.1 MM 318,9 395 502 42 40 40 40 40 STRIP WIDTH 38.1 MM 318,9 396 502 42 40	Tensile Test																				
Type of Specimen Area YS TS (MM2) (MPA) (MPA) (MPA) (MP	Specimen Direction: Longitudina	11				Temp	erature	Room T	emperatur	b		Wall	Thicknes	s: 8,18 m	п			Gag	e Length	: L0=2"	
Type of Specimen Area VS TS (MMZ) (MPA) (MPA) 290 415 292 415 A34 STRIP WIDTH 38,1 MM 348,7 389 455 STRIP WIDTH 38,1 MM 318,9 395 502 STRIP WIDTH 38,1 MM 318,9 395 502 STRIP WIDTH 38,1 MM 318,9 395 502 STRIP WIDTH 38,1 MM 318,9 396 508 STRIP WIDTH 38,1 MM 318,9 396 508 STRIP WIDTH 38,1 MM 328,0 396 508	Method: Elong. Total Under Los	d 0,50 %																			
Max Max Max STRIP WIDTH 38,1 MM 328,0 STRIP WIDTH 38,1 MM 328,0 336,1 490 490 508							T	ype of S	occimen			Area		YS	1	LS	B				
Max 290 415												(MMZ)	0	MPA)	(M	(PA)	%)				
Max 495 625 STRIP WIDTH 38.1 MM 336,8 360 472 STRIP WIDTH 38.1 MM 318,9 395 502 STRIP WIDTH 38.1 MM 330,1 401 490 STRIP WIDTH 38.1 MM 328,0 396 508 STRIP WIDTH 38.1 MM 328,0 396 508			Mili	Require	d: Min									290	A	115	35				
STRIP WIDTH 38,1 MM 336,8 360 472 STRIP WIDTH 38,1 MM 318,9 395 502 STRIP WIDTH 38,1 MM 330,1 401 490 STRIP WIDTH 38,1 MM 328,0 396 508 STRIP WIDTH 38,1 MM 341,8 410 495					Max									495	9	529					
STRIP WIDTH 38.1 MM 336.8 360 472 STRIP WIDTH 38.1 MM 348.7 389 455 STRIP WIDTH 38.1 MM 318.9 395 502 STRIP WIDTH 38.1 MM 328.0 396 508 STRIP WIDTH 38.1 MM 328.0 396 508 STRIP WIDTH 38.1 MM 341.8 410 495																					
STRIP WIDTH 38.1 MM 348.7 389 455 STRIP WIDTH 38.1 MM 318.9 395 502 STRIP WIDTH 38.1 MM 330,1 401 490 STRIP WIDTH 38.1 MM 328.0 396 508 STRIP WIDTH 38.1 MM 341,8 410 495	175141 030003103023						STR	IP WID.	TH 38,1 N	M		336,8		360	4	172	41				
STRIP WIDTH 38,1 MM 318,9 395 502 STRIP WIDTH 38,1 MM 330,1 401 490 STRIP WIDTH 38,1 MM 328,0 396 508 STRIP WIDTH 38,1 MM 341,8 410 495							STR	IP WID	TH 38,1 N	IM		348,7		389	4	55	40				
STRIP WIDTH 38,1 MM 328,0 396 508 STRIP WIDTH 38,1 MM 341,8 410 495	175142 030003103024						STIR	IP WID	TH 38,1 N	IM		318,9		395	90	102	45				
STRIP WIDTH 38,1 MM 341,8 410 495							STR	IP WID	TH 38,1 N	(M		330,1		401	4	060	40				
STRIP WIDTH 38,1 MM 341,8 410 495	176433 030003103452						STR	IP WID	TH 38,1 N	W		328,0		396	30	80	43				
							STR	IP WID	TH 38,1 N	IM		341,8		410	4	560	40				





Inspection Certificate (According to DIN EN 10204.3.1) Nº .: 0030030841 / 00

Sheet:3/4

Hardness Test

Scale: HV

Max Required: Min

Max

246,0

Control Lot

Heat

164.0 170,0 162,0 0'691

0'091

158.0

Direction: Longitudinal AE2 AEI Test Specimen: CHARPY 10X55X7.5 V NOTCH Impact Test

LE AVE (Mills)

LE3

LE2

LEI

SA Avg (%)

SAS (%)

SA4

SA3 (%)

SAI

AE AVE (F)

AES 5

AE4

AE3 5 7

5

5 5

5

21

Temperature: 46°C

(%)

(%)

(%)

50

50

Striker radius: 8 mm

(Mils)

(Mills)

(Mils)

75 80

15 80 80

> 08 80

80 08

100 001 100

001

100 100

8

264 264

261 255 245

267 264

270

267

00 100

100

100

100

Max Required: Min 175142 030003103024 175141 030003103023 176433 030003103452 Heat Control Lot

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

Test Specimen: CHARPY 10X55X6.67 V NOTCH

Direction: Transverse

AE3 AEZ 5 AE1 3 Required: Min

Max

208 196

203

206 190

100 100 001

100 100 100

001 00

100

100

75 82 80

LE AVE

(MIIs)

(Mils) LE3

(Mils) LEZ

(Mils)

(%) 09

(%)

(%)

(%)

20

LEI

SAAVE

SAS

SAA

SA3

SAZ (%)

SAT

AE Avg

AES

AE4

5

3

00

(%)

5

20

Temperature: 46°C

Striker radius: 8 mm

78 82 80

22 23 23

78 22

100

100

8

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

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

176433 030003103452

Heat Control Lot





Inspecting (According (According No.: 0030030841 / 00

Inspection Certificate
(According to DIN EN 10204.3.1)
S41 / 00
Sbeets / 4

EDITIONS

2. SKU 2530112

3. THE WORKS OPERATE A QUALITY MANAGEMENT SYSTEM ACCORDING TO EUROPEAN DIRECTIVE 2014/68/UE ANNEX 1 PAR, 4.3 (CERTIFICATE 2016 BH MP 02-03 VALID UNTIL 12:05:2019).

- MATERIAL ACCORDING TO PED 2014/68/UE ANNEX 1 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

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

e-mail:Juls.silva@vallourec.com

ING. LUIZ FERNANDO DA STLVA - CPEA MG SR34-1 TECHNICAL RESPONSBILE

DATE 11.20.2018

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. Afteration or use for others products are regarded as falsification of documents and will be subject to criminal jurisdiction.

We hereby certify that this product has been manufactured and examined in accordance with



Voltouree Soluções Tubulanes do Brasil S.A. Barreiro Plant - Av. Ofinto Meireles, 65 ZIP 300-00-010 - Belo Horromte, MG



Inspection Certificate (According to DIN EN 10204.3.1)
No.: 0030031810 / 00

Sheer 1 4

Customer: VALLOL/REC CANADA INC

Country: Camala

Material Number: 276024
Work Order: 534782 / 80
Customer Order: VM-4748 - P.O. 4038825-400

Inspection: Calleorer Solucios Tobulares do Brasil S.A.

PRODUCT: SEAMLESS STUBL PUTE, ROT FINISHED , BEVELED ENDS 30 DEG., NORMALIZED DIMENSIONS, 219,10 non N 8,18 non SCHEDULE; 600 GRADE; GRADE; GRADE; 200 # GR 1 # 6 # H STANDARD: CSA-Z245 1-18 - CATEGORY II

2530112

570

00

IN ACCORDANCE ALSO TO THE STANDARDS, ASTMA 333M - 14 ASTMA 4 00M - 18 ASTMA 530M - 12 B ASTMA 53M - 12 B ASTMA 53M - 17 B ASTMA 53M - 17 B ASTMESA 999M - 17 B ASTMESA 999M - 17 B ASTMESA

CUSTOMER SPECIFICATION: CCTF GrB.1,6.290 Car II SS., 20.11.2017

SURFACE PROTECTION: EXTERNAL: LACQUER PIPE ENDS PROTECTOR: PLASTIC CAP

TOLERANCES: OCTSIDE 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 SO MANUFACTURER CSA-2245-LIN 219-LIN MAC 55 5 HS LINGTH HEAT NUMBER ASTM AFASMESA 333, 1% HF SCH 040 LT 40C ASTM A ASMESA 106 B 16300 KPA WEIGHT ASTM A 53 B NPS 8" X SCH 40 VSB LOCO

SHIPPING MARKING: NACE MR 0175/NACE MR 0103 - MADE IN BRAZIL * VM4748 / P.O.# 403/825-00/11EM-8 * TORONTO * CCTP

Pieces	-	y _c	38
Heat	175146	(77833	Tarsil

THE PRODUCT IS SATISFACTORY IN THE FOLLOWING TESTS / INSPECTIONS: DIMENSIONAL # CLAITEMING TEST # ENDS INSPECTION : UNLESTED INDISCROBY IN THE PROPERTY IN THE 5 S # RESIDUAL MAGNETISM: MAN 30 GAUSS # FLECTROMAGNETR 1181 CSAZAST-NJ0LONTRANDULINS # ULTRASONIC TEST FOR LAMINSAR DEFECTS: ACC., CSAZ248.1-SOUR SIERVICE #





Cremical Composition (%) Created Composi	vallourec							Scottos				KINA to the notified out the	1914V inst Detaklifo entjelene	- b	Z	.: 003	Inspect (According (According) Nº.: 0030031810 / 00	nspec seconding	tion C	Inspection Certificate (According to DIN EN 102043.1) 810 / 00	Sheet:2 4
State Oxygen Further, heals fully billed CEL: Cr - Cn - Mn - Ni - V Ni Ti N C3 C4 C5 C6 C7 Ni Ni C7 Ni Ni Ti N C3 C5 C7 C6 C7 Ni Ni C7 Ni Ni Ti N C3 C7 C7 Ni Ni Ti N C3 C7 C7 C7 Ni Ni Ni Ni Ni Ni Ni N																					
No. Cr. Min M. Ch. N. Nb B Ti N Ch. Cr. Ni	Chemical Composition	(%)					Prucess	Baxic O	rgen Fur	race, lica	us bully	lilled									
NS Cr Min M Ch N Nh H Ti N Ch Ch 0	Ceqr CSA-X245.1-CE11					Ceq	: (- Nu	N-CF-M	A-217-4	SECONT.	45		1: Cr - C	- Mo-	A - 18						
0. 0.4001 0.300 0.120 0.4001 0.0031 0.010 0.110 0.4001 0.120 0.4001 0.120 0.4001 0.110 0.4001 0.120 0.4001 0.120 0.4001 0.4001 0.4001 0.110 0.4001 0.			÷	Mir	Ь	36	Z	N							11.	1	Ca	ton.3		CEL	
0. 0.000 0.000 0.000 0.000 0.0000 0.0000 0.110 0.110 0.120 0.0000 0.120 0.00000 0.0000 0.0000 0.0000 0.0000 0.00000 0.00000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0	Heat Analists	Min		0,400			001'0														
0,400 0,000 0,100 0,100 0,100 0,100 0,100 0,100 0,100 0,100 0,000 0,000 0,100 0,100 0,000		Max	0,240	1,350	0,025	0.025	0.500			157	10.				0.110			0.400		1,000.1	
1	Product Analisys	Min		0.400			0079														
0.01 0.04 0.01 0.022 0.0004 0.015 0.0004 0.0002		Max	0,240	1,350	0.023	5200	0.500			120	0,			100.0 02				0.400		1,000	
0,01	theat Control Lat																				
0,01	175146 030003113164		0.11	(,20		0.003	0.29	10,0										0.281		0,086	
1,01 0,04 0,01 0,029 0,029 0,004 0,014 0,029 0,000 0,001	Check 1		0.11	1,29	0.010	0.005	05.0	0.01									0,0012	(1,2%4		0,007	
String with the string String with the str	Check 2		0.11	1.30	0.000	7(8)2	0.31	0.01										0,283		0.084	
7 6,03 0,07 0,01 0,030 0,003 0,015 0,0002 0,002 0,002 0,004 0,2018 0,2 7 0,03 0,07 0,01 0,030 0,003 0,015 0,0002 0,002 0,004 0,2018 0,2 14 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	177833 030003140903		11.0	1.29	0.000	0,094	823	0.03										0.289		0,204	
Type of Specimen	Check I		11,11	1.28	110.0	0,003	0.27	0.03										0,287		6,203	
Type of Specimen Area YS TS E Type of Specimen Area YS TS Type of Specimen Area TS TS Type of Specimen TS Type of	Check 2		01,10		0.011	5,00,0	0,27	6,03									910079	(1,277)		0.203	
Type of Specimen	Ceg: Carbon Equivalent: C	eq. Carhon	Equivate	ent: CE:	Combine	d Eleme	nts:														
Tomprematures Rosan Temperature	Tensile Test																				
Type of Specimen	Specimen Direction: Longas	dinal				Ten	quentur	e: Room	Temperatur	ju.		11.2	II Thickn	258: N.18	min.			Can	ge Lengt	h: 1.0 2"	
Type of Specimen Area YS TS Required; Min 290 415 May 87RH WIDTH 38 MM 324.3 383 502 STRIP WIDTH 38 MM 329.7 399 515 STRIP WIDTH 38,1 MM 345.2 420 519 STRIP WIDTH 38,1 MM 345.2 425 525 STRIP WIDTH 38,1 MM 540,7 425 525 STRIP WIDTH 38,1 MM 540,7 425 525	Method: Elong, Total Under	Lund (1,50 %.																			
Required; Min CMPA CMPA CMPA Man								Type of	уресінген			Area		5.4		SJ	77				
Required; Min 290 415 Man												ININ	(1)	(MIPA)	()	IP.N)	3	-			
Man, STRIP WIDTH 38 MM STRIP WIDTH 38, LAM STRIP				Requir	ed; Min									200		5	15				
STRIP WIDTH 38 AM \$29.7 399 515 STRIP WIDTH 38, LAM 305.2 420 510 STRIP WIDTH 38, LAM 500.7 425 525					Mar									793		(25					
STRIP WIDTH 38 MM 329.7 399 815 STRIP WIDTH 38 MM 305.2 420 519 STRIP WIDTH 38.1 MM 300.7 425 525	Reat Control Lot																				
STRIP WIDTH 38,1 3M 329,7 399 515 STRIP WIDTH 38,1 3M 385,2 420 319 STRIP WIDTH 38,1 3M 380,7 425 525	(75)46 03000313364						2	TRUE WE	DVH 38 M	7		324.3	(Gal)	1585		5(1)	77				
STRIP WIDTH 38.1 MM 305.2 420 510 STRIP WIDTH 38.1 MM 500.7 425 525							50	TRUE WY	DTH 38 M	M		329.7	4	390	- or To	10.	T.				
300,7 425 525	172833 ((30003140903						35	RIP WIL	VITE 38, 1 3	IV)		305.2	922	420)		910	H				
							T.	RIP WIL	TH 38,13	IN		300,7		425		525	ī				





Inspection Certificate (According to DIN EN 10204.3.1)
No.: 0030031810 / 00

Sheet;3 4

Hardness Test

Seale: HV

Max
Required; Min
Max 246.0
Max 246.0
175146 030003113164 150.0
177833 030003113164 155.0

																1
Impact Test																
Test Specimen: CHARPY 10X55X7.5 V NOTCH	Dire	Direction: Longitudinal	lenibu			Тетр	Temperature: -16°C	29			Str	Striker radius: 8 mm	8 mm			
	AE1	$\Lambda E2$	AE3	NE4	AES	AE Avg	SAL	5.42	8.4.3	5.14	8.15	S.1.11g	LEI	1.1:2	LES	LE Avg
	(7)	(1)	(5)	(3)	(1)	(7)	(n/a)	(%)	(%)	(%)	(%)	(%)	(AHIS)	(Mils)	(MHS)	(Mils)
Required: Min	Min 21	7.	12			17	50	50	501			09				
	Max															
Heat Control Lot																
175146 030003113164	270	275	2.62			269	100	100	1001			100	78	$\frac{1}{2}$	SO	SO
177833 030003140903	27.5	263	270			269	100	100	100			100	7.1	70	69	7.3
AE - Absorbed Energy; SA - Shear Area; LE - Lateral Expansion;	on:										9					
Impact Test																
Test Specimen: CHARPY 10X55X6,67 V NOTCH	Dire	Direction: Transverse	crse			Тепр	Temperature: -16°C	.J.,y			Stri	Striker radius: 8 mm	S mm			
	AEI	AE2	AE3	AE4	AES	AE Avg	SAL	SA2	5.43	5.74	848	SA AVE	LEI	1.62	LE3	LE Avg
	(3)	(F)	(7)	(1)	(3)	(7)	(%)	(%)	(%)	(%)	(%)	(%)	(Mils)	(Mills)	(Mits)	(Mils)
Required; Min	Min 18	- S	×			×	50	5()	5(1)			69				
	Max															
Heat Control Lot																
177833 030003140903	210	186	174			190	100	100	100			100	88	8.7	88	88
AE - Absorbed Energy; SA - Shear Area; LE - Lateral Expansion;	:00															

Remarks:

L MATERIAL IN ACCORDANCE WITH NACE MR 0175

PAR, 3,2/ISO 15156-2, ANNEX A,2,1,2/NACE MR0103 PAR,2,1, ALL LATTEST

EDITIONS

2, SKU 2530112

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





Inspection Certificate (According to DIN UN 10204 3.1) Nº.: 0030031810 / 00

Sheers4 4

DRIGGTIVE 2014 6XTH, ANNEX TPAIC 4,34CERTHICATE 2016 BITMF 02403 VALID UNTIL 12:05:2019).

- MATHRIAL ACCORDING TO PED 2004/08/ETE ANNIN UPAR, 7,5

4 - NO WITD REPAIR

-FREE OF MERCERY CONTAXINATION

- NO RADIOACTIVE CONTAMINATION

- I'INE GRAIN PRACTICE

- FULLY KILLED STUDE

- MATERIAL FROM BRAZEL

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

e-mail:dais,sitea'a vallaures,cum

01,32,3019 DATE

1 4

satisfactory, This restimunial and certificate respectively is recorded by a computer system and Is called without signature. Alteration or use for others products are regarded as falsification of We herely 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 documents and will be subject to criminal jurisdiction.

TECHNICAL AJSPONSIGLE

SC. LUK FERNANDO DA SALA A CO



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

Date: 6/11/2019

Mill Test Reports

Invoice: 1596643-01

Customer: 27403-261

PO: 2610087

EQUIPEMENT KN POUR ABF MINES

8254 RANG DU VIEUX PONT ROUYN-NORANDA, QC J9Y 0H4

HEAT: 61b01013 ** CCTF Sku: 7561296 8 STD LR 45 WELD ELL A420WPL6 Invoice: 1596643-01 PC: 2610087 6/11/2019 8:46:53 AM

INSPECTION CERTIFICATE

Purchaser:

TO EN10204 3.1

Job No.

Purchase Order No.

BENKAN

58 Soi Watkrinal, Bangkru, Prapadeong, Samwiprakara, 10130 Thailand. Thai Benkan Co., Ltd.

Certificate No. Z

0

2018020878

08/08/2018

A234-18/SA234-17 Gr.W	Made from Scarnless Pipe			specificat	ion for In	Specification for Inspection		Visual Examination	Di	Dimensional Inspection
	A234-16/SA234-17 Gr.WPB/A20-16/SA320-17 Gr.WPL8 CSA.Z46.11-17 GR.241 CAT I MIGC 95	7 Gr.WPL8		ME B16.9	F2012,81	ASME B18.9-2012,816.25-2017		Good		Good
	Produi	Product & Size				(1,*1)	Quantity	ntity	Hardm	Hardness Actual Data
7561296	45 EL WPB/WPL6 8 STD	BAWPL6	8 STD					50	HBW	HBW.123,126,128
	Material Reat No.	.00	5	Chemical Composition%(Note1)	paskian%((Note1)	Baran (%)	(%)		
	J5K1189			1	Tl= t		0	0.0001		
Chemical Co.	Chemical Composition %		H			%2 Te	*2 Tension Test	transverse	HY	HARDNESS MAN 1971III : CROOD
S Cu	i Z	Mo	IA	>	N _B	C.F.	YS	TS	m	Impact Test (J)
x x 1000 100	x x 100 100	x 100	x 1000	x 1000	x x	x 100	MPa		%	10 X 6.7 X 2V AT -46 °C
							240	415	30	116
40 40	40 30	12		80	20	40		585		127 AVE. 111
1	3 11	-		0	0	36	295	452	48	06

NORMALIZING 810 C X 40 MINUTES. COOLED IN STILL AIR

(Note 1): Specification of TI Composition (%): Max 11 (TI x 100)

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

Material according to ANSI/NACE MR0175/ISO 15156-2-2015 Annex A & MR0103-2015 (SSC Region 3)

MAGNETIC PARTICLE EXAMINATION FOR TEE ONLY:

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

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

* 1. "T' symbolized wall thickness in mm. * 2. YS Yield strongth TS = Tensilo strongth II = Blongation

Quality Assurance Manager Thai Benkan Co., Ltd. Rungneya Kemphenon

COMPANY WITH MANAGEMENT SYSTEM CERTIFIED BY DNV GL = ISO 9001 = = ISO 14001 =



METALFAR PRODOTTI INDUSTRIALI SPA 23861 CESANA BRIANZA (LC) - ITALY VIA G. PARINI, 28 PHONE + 39 031 655441 - FAX +39 031 655149 certificate/filmetalfor/taly com

COMPANY WITH MANAGEMENT SYSTEM CERTIFIED BY DNV GL = ISO 9001 = - 100 14001 -

	2.73 Krs	** - 2 minute of the control of the	arricay, our			SU 14001 =
	INSPECTION CERTIFI	CATE EN 10204:2004 / 3.1	AD2	Nr^03 2018-C_MF	F-04299 Data / Da	ted 31.10.2018 20
	TRIES RIDGE ROAD SUITE 2 ONTVALE N.J	04	VS	Ordine / PO Item DDT / Delivery note Packing List Fattura / Invoice Ns. rff. / Our ref.	69051/BG 015 2018-3E301-000 2018-3E401-000 2018-3E401-000 2017-3E201-000	4238 4238
Dest		1	ADE CA			
Cod. colata Box Heat Code	Nr. colata Heat Nr 18/38332	THE RESERVE OF THE PROPERTY OF	58'394 RF 8" STD	19 Description LF2CL1	Contract of the Contract of th	801 (806 811)

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

102 FULLY KILLED STEEL AND FINE GRAIN PRACTICED Ann, mat. / Mal. remarks GRAIN SIZE 7 OR FINER NO WELD REPAIR C Elementi / Elements SI Mn S P Cr Cu V N Mo TI Nb LADI F ANALYSIS 0.185 0,220 1,090 800.0 0.009 0.110 0,050 0,010 0,016 0,160 0,002 0,001

CERT 4687-2014-CE-ITA-DNV GL

- N 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 Cs CE F1 F2 PREN 0,025 0,0004 LADI F ANALYSIS 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

FormaC1C *CC2) Snervamento>0,2% C11 Snervamento>1,0% C11 Rottura C12 Provetta Allungamento C13 Contrazione DIS Test specimen Shape Yield Strength>0.2% Yield Strength>1,0% Tensile Elongation Reduction of area Sez/Sect mm2 Geuge Lmm 1=0 - 2= MPa MPa MPa % %

126,60 50,80 1 20 335,0 530,0 69,0 DUREZZA / HARDNESSC22 RESILIENZA / IMPACT TEST

Provetta / Test Specimen CC Ch1 1-Joule C42 2-Joule C42 HBW Tipo/Type Cas 3-Joule C42 Media/Average C43 KV -46 162.0 166,0 160,0 10x10 mm 57 60 50 55,7 Tratt. Term. / Heat treatment CON NORMALIZED AT 930 °C - COOLED IN STILL AIR CONTROL OF THE PROPERTY OF THE PR GAS FURNACE Dim in acc. a / Dim. acc. to ASME/ANSI B16,5 -2017; ASME/ANSI B36,10M -2015; ASME/ANSI B16,25 -2017

Finitura / Roughness ASME/ANSI B46.1 -2009 125-250 uin AARH Marcatura in acc. 80 Origina ITALY ANSI/MSS SP-25-2018 Vis. & Dim. SATISFACTORY Marking in acc. to Origin of Steel

100% MANUFACTURED IN ITALY Note / Notes

> 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'	ADS
QUALITY CONTROL DEPARTMENT	
1 - 1: -	
H3. Frigeno	

ENTE UFFICIALE DI COLLAUDO INSPECTION AUTHORITY

MARCHIO PRODUZIONE MANUFACTURER'S SYMBOL





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

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



INSPECTION CERTIFICATE

SEAMLESS LOW TEMPERATURE CARBON CCTF CORPORATION Customer

Product

Spec

NACE MR0175/ISO 15156-2 Region 3-15 ASTM A420-16/ASME SA420-15 WPL6, CSA 2245.11-17 Gr 241 Cat II -45C SS STEEL BUTT WELD FITTINGS

TEL:(07)831-9157

00700020-0401 4038285-00 Certificate No Order No

2018/12/11 Date

FAX:(07)821-7500, 831-2942

17, TUNG LI ROAD, HSIAO KANG DISTRICT,

KACHSIUNG CITY, TAIWAN, R.O.C.

CHUP HSIN ENTERPRISE CO., LTD.

ACCORDANCE WITH EN 10204-3.1

ASTM A234-18/ASME SA234-15 WPB & NACE MR0103-16,

			Raw Material	erial				Specific	ation fu	Specification for Inspection	ection			Visual Inspection	spection			Dimen	Isional	Dimensional Inspection	tion	
	ASTIN	A A105 G	ASTM A106 GR.B/GREEN PIPE FOR A333-6	N PIPE	FOR A3.	33-6		AS	ME B16	ASME 816.9-2012	2			PA.	PASS				PASS	SS		
																		dwl	Impact Test	est		
	Item			Description	ption			Quantity	Heat 1D		Heat No		Raw Material Certificate No.	Certificate /	No	MT	Test Temp	Size of specimen		Charpy VNotch Impact Value J	lotch	Ave.
7540109		90 E L/1	90 E L/R WPL6 STD 90 E L/R WPL6 XS	S S		mN		100	A606 C023	Dr. Groter	18322023	BAOS	18322023 BAOSTEEL BGSAG1801240000400 18322023 BAOSTEEL BGSAG1804020007200	8040200072	400		45	10 X 5.0 X 55 10 X 5.0 X 55	62	48	52	55.33
7581733	16	30 E L/ TEE WF	90 E L/R WPL6 XS TEE WPL6 STD	0		00 00		n vn	956V		3323304 335956V	HENG	18353504 BAOSTEL BGSAG1804250001100 1535956V HENGYANG C201538794-1	38794-1	100	PASS	45	10 X 7.5 X 55	46	276	48	48.67
						Chemica	al Comp	Chemical Composition%						Tensile Test		Hare	Hardness					
	Specifi-	U	iž	Mn	а	S	Z TO	C,	Mo	>	NB	C.E	Y,S	T.S	ш	=	Test	Heat Treatment	rent		REMARK	ARK
	cation	-													-							

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.

NORM, 910°C x0.5HR

133-134 133-134 134-135 133-134

39.0

42950 41208

20

20 V

80

12

30

40

40

40

35

135 78

30

20

Min. Max. 35.0 44.0 42.0

67300 65300 67000

44256

26 26 35

20 20 2

2 2 2 2 8

2 4 4 4

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13 7 13

17 16 16 27

12 12 13

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46722

197

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35000 P.S.I

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P.S.1

X100

X1000 X1000

X100

X100

X100

X100

X1000 X1000

X100

X100 13 40

X100

Assummee Section Chief of Quality

CERTIFICATE OF INSPECTION & TEST (EN 10204 3.1)

OFFICE – 74, Jwadongsunhwan-ro, Haeundae-gu, Busan, Korea



No.	MJH0165-02/07	Date: DEC 20. 2018	Tel: +82.51.744-4680(5 line) Fax: +82.51,744-4670 E-mail:qm@stnhcorp.com
	CCTF CORPORATION		Certified to ISO9001/ ISO14001;2015,PED2014/68/EC by LRQA
	4038829-00		
rial	ASTM A105N-18, ASME SA105N-1	7,ASTM A350 LF2 CL1-18,ASME SA350 LF2	50 LF2 CL1-18,ASME SA350 LF2 CL1-17,NACE MR0175/ISO 15156-2:2015,NACE MR0103/ISO 17495-1:2016
440	930°C NORMALIZED & A.C.	Din	Dimensional inspectionASME B16.5 - 2017

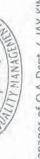
				Size o	Size of Test		ensio	Tension Test		H	Hardness		Charpy II	mpact Te	St
			the state of	Spec	Specimen	>	S	S	RA		Fest	(10)	(10mm)	(10X10mm Specimen Size)	Size)
	ITEM / SIZE	Q'ty	Heat No./	٥	G.	M	_	Pa %			(HB)	Indiv.	Ave.	Notch	Temp.
				mm.	mm		-	55			187	163	207	>	-
				12.5	50.0	Min 2		485 22.0	0 30.0	0		Test	st Result (J)	(1)	Ave.(J)
7586502	150LBS TH RF 6"	5	508105C	12.5	50.0	330		522 33	1 73	150	155	136	154	142	144
7581210	300LBS WN RF XH 6"	20	508105C	12.5	50.0	3		22 3	1 73	150	155	136	154	142	144
7586891	150LBS WN RF STD 8"	20	508105D	12.5	50.0	33	2.1	522 33	3 73	150	155	136	154	142	144
7586867	300LBS WN RF STD 4"	25	5081050	12.5	20,0	m.		522 33	1 73	15	155	136	154	142	144
7585496	300LBS WN RF STD 6"	35	S08105D	12.5	50.0	33	U	122 33	1 73	150	155	136	154	142	144
	BLANK		BLANK					SLANK		80	LANK				

Heat No./ Max									CH	emical	Compos	Chemical Composition (%)				NDE	
No. Max 0.300 0.300 1.350 0.035 0.040 0.400 0.080 0.080 0.020 0.020 0.150 0.060 0.0388 UT MT H 0.159 0.234 1.260 0.011 0.003 0.017 0.005 0.017 0.001 0.001 0.004 0.003 0.017 0.005 0.017 0.004 0.001 0.004 0.003 0.017 0.005 0.017 0.004 0.004 0.004 0.004 0.005 0.017 0.005 0.017 0.005 0.017 0.005 0.017 0.004 0.004 0.004 0.004 0.005 0.017 0.005 0.017 0.005 0.017 0.005 0.017 0.005 0.017 0.005 0.017 0.005 0.017 0.005 0.017 0.005 0.017 0.005 0.017 0.005 0.017 0.005 0.017 0.005 0.017 0.004 0.005 0.017 0.005 0.017 0.005	Heat No./		Ü	-	Mn	0.	S	N	b	Mo	Cu	>	Nb l	CE			
H 0.159 0.234 1.260 0.011 0.003 0.017 0.005 0.017 0.005 0.017 0.004 0.004 0.160 0.244 1.250 0.011 0.003 0.017 0.079 0.006 0.018 0.001 0.004 0.004 0.003 0.011 0.003 0.017 0.005 0.017 0.005 0.001 0.004 0.004 0.004 1.250 0.014 0.003 0.017 0.079 0.006 0.018 0.001 0.004	Batch No.	Max	0.300	-	1.350	100000	0.040	0.400	0.300	0.120	0.400	0.080	0.020		10	M	Ы
P 0.160 0.244 1,250 0.014 0.003 0.017 0.079 0.006 0.018 0.001 0.004 H 0,159 0.234 1,260 0.011 0.003 0.017 0.005 0.017 0.005 0.017 0.004 P 0,160 0.244 1,250 0.014 0.003 0.017 0.079 0.006 0.018 0.001 0.004		Ι	0.159	0.234	1.260	0.011	0.003	0.019	0.077		710.0		0.004	0.388			
H 0,159 0,234 1,260 0,011 0,003 0,017 0,005 0,017 0,005 0,017 0,004 0,004 0,004 1,250 0,014 0,003 0,017 0,079 0,006 0,018 0,001 0,004	508105C	n.	0.160	0.244	1,250	0.014	0.003	0.017	0.079		0.018		0.004	0.387			
P 0.160 0.244 1.250 0.014 0.003 0.017 0.079 0.006 0.018 0.001 0.004		I	0,159	0.234	1,260	0.011	0.003	0.019	0.077		0.017		0.004	0.388			
	508105D	0	0.160	0.244	1,250	0.014	0.003	0.017	6200		0.018		0.004	0.387			

REMARK * H: Heat Analysis P: Product Analysis

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

Witnessed by / H. J. LEE



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

ST-801-14-02

CERTIFICATE OF INSPECTION & TEST (EN 10204 3.1)

MJH0137-07/11 Certificate No.

CCTF CORPORATION Contract No. Customer

Date: DEC. 19, 2018

ST&H CORPORATION

PLANT - 11, Eogokgongdan 2-gil, Yangsan-si, Kyungnam, Korea OFFICE - 74, Jwadongsunhwan-ro, Haeundae-gu, Busan, Korea Tel: +82.51,744-4680(5 line) Fax: +82.51,744-4670

E-mail :qm@stnhcorp.com

Certified to ISD9001/ ISO14001:2015,PED2014/68/EC by LRQA

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 930°C NORMALIZED & A.C. 4038743-00 Spec. For Material Heat Treatment

				Size o	ize of Test		Tens	Tension Test	15		Hardne	523	Ċ	narpy In	Charpy Impact Test	2¢	_
			111111111111111111111111111111111111111	Spec	Specimen		V.S.	T.S	EL	R.A	Test		(10X1	10X10mm S	Specimen Size)	Size)	
	ITEM / SIZE	0,12	Heat No./	٥	GL		MPa	MPa	%	%	(HB)		ndiv.	Ave.	Notch	Тетр.	
			batch No.	mm	mm	Max		655		-	187		163	20)	>	-46°C	
1				12.5	50.0	Min	250	485	22.0	30.0			Test	Result:	(7)	Ave.(J)	
7585585	150LBS BL RF 6"	40	508101C	12.5	50.0		339	525	34	78	651	52	188	165	195	183	
7585666	300LBS BL RF 8"	25	508101C	12.5	50.0		339	525	34	78	651	62	188	165	195	183	
7580185	900/1500LBS SW RF S160 2"	20	508101C	12.5	50.0		339	525	34	78	. 65	62	188	165	195	183	
7580219	150LBS SO RF 10"	20	508101F	12.5	50.0		339	525	34	78	. 651	162	188	165	195	183	ī
7586507	150LBS SO RF 3"	50.	508101F	12.5	50.0		339	525	34	78	651	29	188	165	195	183	
7586508	150LBS SO RF 4"	25	508101F	12.5	50.0		339	525	34	78	. 65	29	188	165	195	183	
7586509	150LBS SO RF 6"	70	508101F	12,5	50.0		339	525	34	78	65	29	188	165	195	183	
7580218	150LBS SO RF 8"	25	508101F	12.5	50.0		339	525	34	78	. 65	62	188	165	195	183	
	BLANK		BLANK					BLAN	×		BLAN	×					

								Ch	emical	Compos	Chemical Composition (%)				NDE	
Heat No./		u	13	Min	Б.	W	N	ò	Mo	> no	>	NB	33			
Batch No.	Max	0.300	0.300	1.350	0.035	0.040	-	0.300	0.120 0.400		0.080	0.020		5	MT	PT
	I	0.160	0.207	1.250	600'0	0.007	0.020	0.091	0.002	0.024	0.001	0.004	0.390			
508101C	۵.	0.164	0.220	1,250	0.009	0.005	0.013	0.092	0.002	0.022	0.003	0.004	0.394			
	I	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	a	0.154	0.220	1.250	600.0	0.005	0.013	0.092	0.002	0.022	0.003	0.004	0.394			

BLANK

* H Heat Analysis P : Product Analysis REMARK Witnessed by / H. J. LEE

YMANAC

Manager of Q.A Dept, / JAY KIM

ST&H CORPORATION

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

ST-801-14-02



INSPECTION CERTIFICATE

17, TUNG LI ROAD, HSIAO KANG DISTRICT, CHUP HSIN ENTERPRISE CO., LTD. ACCORDANCE WITH EN 10204-3.1 KAOHSIUNG CITY, TAIWAN, R.O.C. TEL:(07)831-9157 SEAMLESS LOW TEMPERATURE CARBON ASTM A420-16/ASME SA420-15 WPL6, CSA Z245.11-17 Gr 241 Cat II -45C SS STEEL BUTT WELD FITTINGS CCTF CORPORATION

Custorner Product

Spec

00700220-0110 4039057-00 Certificate No Order No

2019/03/19 Date

ASTM A234-18/ASME SA234-15 WPB

NACE MR0175/ISO 15156-2 Region 3-15 & NACE MR0103-16,

FAX:(07)821-7500, 831-2942

	_		_		_		- 1				1
			Ave.	60	51.33	140	174.67		ARK		
ion			otch	62	52	150	178		REMA		
Inspect	N	est	py VN act Valu	62	48	142	184				
sional	PAS	act Ti	Char	56	54	128	162		ent		
Dímen		dwl	Size of specimen	10 X 5.0 X 55	10 X 5.0 X 55	10 X 10 X 55	10 X 10 X 55		Heat Treatm		
			Test Temp	-45	445	-45	-45	559			
			MT	1	PASS	PASS	PASS	Hardn	Tes	НВ	
spection	55		No.			100	006		w	%	
Visual In	7d		Certificate	1289-1	1281-1	303080005	304040005	ensile Test	T.S	P.S.1	
			w Material	NG C20184	NG C20184	L BGSAG18	L BGSGG1	F	7.5	P.S.I	
			Rav	HENGYAL	HENGYAL	BAOSTEE	BAOSTE		C.E	X100	
100			t No	886V	7588	2248			NB	X1000	
nspecti	2012			1834	1834	1832	342		>	X1000	
ion for	E 816.9		Heat ID	V988	8850	A248	E274		Mo		
ecificat	ASM		ntity	52	2	00	2	%uo	ŭ	X100	
Sp			Qua	101				mpositi	ž	X100	
					7 6			ical Co	n _O	X100	
	333-6			9	4 4 X X	9	00	Chem	S	X1000	
	E FOR A		ription 154	288	7007	938	846		۵	X1000	
aterial	EN PIP		Desc			-			Mn	X100	
Raw M	R.B/GRE			WPLE	WPL6	16 XS	L6 XS		Si	X100	
	1106 GF			45 E L/R	RED TER	TEE WP	TEE WP		U	X100	
	ASTM		Item				-		Specifi-	Cation	
	Raw Material Specification for Inspection Visual Inspection	Specification for Inspection Visual Inspection PE FOR A333-6 ASME B16.9-2012 PASS	Specification for Inspection ASME B16.9-2012 PASS	Raw Material Specification for Inspection Visual Inspection Ofmensional Inspection A A106 GR.B/GREEN PIPE FOR A333-6 ASME B16.9-2012 PASS PASS A A106 GR.B/GREEN PIPE FOR A333-6 ASME B16.9-2012 Raw Material Certificate No. NDE Test A Description ASS Impact Value A A106 GR.B/GREEN PIPE FOR A333-6 ASS Impact Value	A 106 GR.B/GREEN PIPE FOR A333-6 ASME B16.9-2012 Visual Inspection Visual Inspection PASS PASS A 206 GR.B/GREEN PIPE FOR A333-6 A 200 GR.B/GREEN PIPE FOR A333-6 A 200 GR.B/GREEN PIPE FOR A333-6 A 200 GR.B/GREEN PIPE FOR A333-6 PASS PASS A 5 EL/R WPL6 STD 12.88 6 GR.B/GREEN PIPE FOR A333-6 B 886V 1834886V HENGYANG C201841289-1 Raw Material Certificate No. MT Temp MT Temp Cmm J 10 X 5.0 X 55 S 56 62 GZ	Raw Material Specification for Inspection Visual Inspection PASS PASS A 106 GR.B/GREEN PIPE FOR A333-6 ASME B16.9-2012 Raw Material Certificate No. PASS PASS Description ASE L/R WPU6 STD 12.88 SS 886V 1834885V HENGYANG C201841289-1 MT Temp Charpy V-North Impact Value ASE L/R WPU6 STD 24.24 Ax 2 10 885V 1834885V HENGYANG C201841281-1 PASS -45 10 X 5.0 X 55 54 48 52 RED TEE WPL6 STD 24.24 Ax 3 15 885V 1834885V HENGYANG C201841281-1 PASS -45 10 X 5.0 X 55 54 48 52 RED TEE WPL6 STD 24.04 Ax 3 15 885V 1834885V HENGYANG C201841281-1 PASS -45 10 X 5.0 X 55 54 48 52	Raw Material Specification for Inspection Visual Inspection Visual Inspection Visual Inspection Other State Specification for Inspection Other State Specification Other State Other State Specification Other State Oth	Raw Material Specification for Inspection Specification for Inspection Visual Inspection PASS PASS A 106 GR.B/GREEN PIPE FOR A333-6 ASME B16.9-2012 Raw Material Certificate No. PASS Impact Fast Test Vibrosition Test Vibrosition Test Vibrosition NOT Test Vibrosition Impact Vibrosition Impact Vibrosition 45 E L/R WPL6 STD 12/88 S 35 886V 1834885V HENGYANG C201841281-1 PASS 45 10 X 5.0 X 5S 54 48 52 RED TEE WPL6 STD 22/24 A X 3 15 885V 1834885V HENGYANG C201841281-1 PASS 45 10 X 5.0 X 5S 54 48 52 TEE WPL6 STD 22/24 A X 3 15 885V 1834885V HENGYANG C201841281-1 PASS 45 10 X 5.0 X 5S 54 48 52 TEE WPL6 STD 24/46 B X 22 B X 22 B X 2448 BAOSTEEL BGSGGI803080005100 PASS 45 10 X 10 X 5S 162 178 178 178 178 178 178 178 </td <td> A 106 GR. B/GREEN PIPE FOR A333-6 A 5ME B16.9-2012 PASS P</td> <td> A106 GR.B/GREEN PIPE FOR A333-6</td> <td> Autor Auto</td>	A 106 GR. B/GREEN PIPE FOR A333-6 A 5ME B16.9-2012 PASS P	A106 GR.B/GREEN PIPE FOR A333-6	Autor Auto

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.

NORM, 910 Cx0.5HR

135-138

197

95000 68100

50

80

40

40

32

30

Max 123 131 132 135

86

20 135

15 40

Min.

30

35000 60000

138-139 138-139 138-139

> 37.0 40.0

37.0

67600 67600 63600

47738 47738

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HNNAA

11 11 11 9 6

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134-135

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68100

39322 38306 Quality (Assurance Section Chici

7014596/4038286-00 10 x 5.0 x 2V 129.7 112.4 115.3 AT -45 'C 119.1 IMPACT TEST (J) *CE ×100 35 50 DATE 2019-01-07 MANAGER OF Q.A. DEPT. 181212-1 18805-1 # _ * PHYSICAL TEST ORDER NO: P.I. NO: 30.9 27.0 EXAMINATION CERTIFI, NO. 8 MAGNETIC PARTICLE ш GOOD S 95.0 \$3 60.0 66.99 TREATMENT 42.0 44.1 2 KS (NOTE) HEAT z B 0001x v HARDNESS E B (NTE): A.: HOT FORMED WITH FINAL TEMPERATURE BETWEEN 620C.-980C. AIR COOLING.

S.STRESS RELIEF AT TEMPERATURE 650°C NO. SIR. AIR COOLING.

S.STRESS RELIEF AT TEMPERATURE 650°C NO. SIR. AIR RECOLING.

MACE MR0175-2015/18015156-1 AACE MR0103-2015/18017945: SATISHEAD N.

WE HERREY CERTIFY THAT THE PRODUCT DESCRIPED HAS BEEN MANUFACTURED IN ACCORDANCE
WITH THE SPECIFICATIONS CONCERNED AND ALSO WITH THE PURCHASERS. S REQUIREMENTS AND THAT THE
TEST RESULTS SHOWN HEREIN AIR CORRECT.

TYPE OF SPECIMEN STREPFWILM: 1 in /GAINE LENGTH: 2 in) ** SAMPLING DIRECTION: LeLONGITIDINAL TETRANSVERSE

*(TELCAMIN 64;CF+MA+V)/5+(CU+N)/1): "CEQ=C+F(Mn/64S)/724+CU/15+N)/20+(C+4M6+V+Nh)/5+58) NW 197 HB MAX 32-143 INDUSTRIES CO., LTD. x1000 100 INSPECTION CERTIFICATE v ACCORDING TO EN10204/DIN50049/3.1 8. MEI-CHUNG RD. NIAO-SONG, > 100 × 5 V VISUAL & DIMENTIONAL KAOHSIUNG 83301,TAWAN TEL: 886-77310527~8 FAX: 886-77315887 INSPECTION GOOD Ma x 25 -CHEMICAL COMPOSITION % 2 B 25 2 2 x100 15/2/10 Z MFG NO. 18C1054 150 ou x100 ×1000 S 3 80 ASME SA420 WPL6-04 CSA Z245.11-17 Gr.290 CAT II Sour Service OUANTITY 25 x1000 0 20 14 Mn x100 130 9 is Si SEYBOLD INT'L CORP. 50 5 ASTM A420 WPL6-16 PRODUCT & SIZE o po x ASME B16.9 -12 7581725 30 -ASTM A333-6 TEE 6"WPL6 STD MAX MIN MATERIAL CHARGE NO. J4LB254 STANDARD PURCHASER STANDARD MATERIALS NSP SPEC TEM TEM 35 8 35 2

x100 *CEO

29 50

CERTIFICATE OF INSPECTION & TEST (EN 10204 3.1)

ST&H CORPORATION

PLANT - 11, Eogokgongdan 2-gil, Yangsan-si, Kyungnam, Korea OFFICE - 74, Jwadongsunhwan-ro, Haeundae-gu, Busan, 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

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 Dimensional inspectionASME 816.5 - 2017 930°C NORMALIZED & A.C. 4038829-00 Heat Treatment Contract No.

Date: DEC, 20, 2018

CCTF CORPORATION MJH0165-03/07

Certificate No.

Customer

TEM / SIZE TEM / SIZE Text Test Te					Size of	f Test		Tens	Tension Test	st	-	Hardness		harpy In	spact Tes	11	
TEM / SIZE					Spec	imen	Ī	Y.S	Z.S.	E.L. R.	A	Test	(10X	10mm S	pecimen	Size)	
12.0 Min Max 655 187 164 201 V 1 1 1 1 1 1 1 1		ITEM / SIZE	0,th	Heat No./	٥	GL		_	_		-0	(HB)	Indiv.	Ave.	Notch	Тетр.	
150LBS BLRF 8" 5 508105E 12.5 50.0 Min 250 33 73 150 155 136 154 142 300LBS BLRF 8" 10 508105E 12.5 50.0 330 522 33 73 150 155 136 154 142 300LBS BLRF 8" 5 508105E 12.5 50.0 330 522 33 73 150 155 136 154 142 142 300LBS BLRF 8" 5 508105E 12.5 50.0 330 522 33 73 150 155 136 154 142 142 150LBS WN RF STD 6" 8LANK BLANK B				batch No.	шш	шш	Max		-		-	187	161	203	>		
150LBS BL RF 8" 5 508105E 12.5 50.0 330 522 33 73 150 155 136 154 142 300LBS BL RF 4" 10 508105E 12.5 50.0 330 522 33 73 150 155 136 154 142 300LBS BL RF 6" 5 508105E 12.5 50.0 330 522 33 73 150 155 136 154 142 150LBS WN RF 5TD 6" 5 508105G 12.5 50.0 330 522 33 73 150 155 136 154 142 BLANK BLANK BLANK BLANK BLANK BLANK BLANK BLANK BLANK 142					12.5	20.0	Min		_	-	0.	j	Tes	st Result	(1)	Ave.(J)	
300LBS BL RF 4" 300LBS BL RF 6" 300LBS BL RF 6" 300LBS BL RF 8" 300LBS BL RF 8" 300LBS BL RF 8" 300LBS BL RF 8" 400LBS BL RF 8	585860	150LBS BL RF 8"	S	508105E	12.5	50.0				33 7	3 1		136	154	142	144	
300LBS BL RF 6" 10 508105E 12.5 50.0 330 522 33 73 150 155 136 154 142 300LBS BL RF 8" 5 508105E 12.5 50.0 330 522 33 73 150 155 136 154 142 150LBS WN RF STD 6" 50 508105G 12.5 50.0 330 522 33 73 150 155 136 154 142 BLANK BLANK	'585640	300LBS BL RF 4"	10	508105E	12.5	50.0		330	522				136	154	142	144	
300LBS BL RF 8" 5 508105E 12.5 50.0 330 522 33 73 150 155 136 154 142 150 LBS WN RF STD 6" 50 508105G 12.5 50.0 330 522 33 73 150 155 136 154 142 BLANK BLANK	7585658	300LBS BL RF 6"	10	508105E	12.5	50.0		330	522	33 7			136	154	142	144	
150LBS WN RF STD 6" 50 508105G 12.5 50.0 330 522 33 73 150 155 136 154 142 BLANK BLANK BLANK	7585666	300LBS BL RF 8"	151	508105E	12.5	50.0		330	522	33 7			136	154	142	144	
BLANK	586832	150LBS WN RF STD 6"	50	508105G	12.5	50.0		330	522	33 7	2	50 155	136	154	142	144	
		BLANK		BLANK					BLAN	X		BLANK					

								Ch	Chemical Composition (%	Compos	ition (%	9			NDE	
Heat No./		Ų		Mn	۵	S	Ni	ò	Mo	ng	>	NP	30 CE			
Batch No.	Max	0.300	0.300	200	0.035	0.040	0.400	0.300	0.120	0.400	0.080	0.020		15	MT	PT
	I	0,159		1,260	0.011	0,003	0.019	0.077	0.005	0.017	0,001	0.004	0.388			
508105E	۵	0.160		1.250	0.014	0.003	0.017	6200	90000	0.018	0.001	0.004	0.387			
	I	0,159		1.260	0.011	0.003	0.019	0.077	0.005	0.017	0.001	0.004	0.388			
508105G	۵	0.160		1,250	0.014	0.003	0.017	0.079	9000	0.018	0.001	0.004	0.387			
										BLANK						

REMARK * H : Heat Analysis P : Product Analysis

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

ST-801-14-02

Manager of Q.A Dept. / JAY KIM

MANAC

Witnessed by / H. J. LEE

ST&H CORPORATION

CERTIFICATE OF INSPECTION & TEST (EN 10204 3.1)

ST&H CORPORATION

PLANT - 11, Eogokgongdan 2-gil, Yangsan-si, Kyungnam, Korea OFFICE - 74, Jwadongsunhwan-ro, Haeundae-gu, Busan, Korea Tel: +82.51.744-4680(5 line) Fax: +82.51.744-4670



E-mail :qm@stnhcorp.com

PS 0 M0308 / 01

Certifled to ISO9001/ ISO14001;2015,PED2014/68/EC by LRQA

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 Dimensional inspection ASME 816.5 - 2017 930°C NORMALIZED & A.C. 4039095-00 Heat Treatment Contract No.

Date: FEB. 14, 2019

CCTF CORPORATION

MJH0290-01/05

Certificate No.

Customer

										Size	Size of Test		Tens	ension Test	15		Hardness	522	טֿ	arpy Im	Charpy Impact Test	
								ĺ	A		Specimen		Y.S	Z.Z	EL	R.A	Test		(10X1	Omm Sp	(10X10mm Specimen Size)	Size)
		ITE	TEM / SIZE	SA1				Q'ty	Heat No./	0	G.					%	(HB)		Indiv.	Ave.	Notch	Temp.
									Batch No.	mm.	шш	Max		655			187		16,1	203	>	-46°C
										12.5	50.0	Min	250	485	22.0 3	30.0			Test F	Result	(1)	Ave.(J)
7585585	150	SOLBS BL RF 6"	RF 6"					20 B(803459	12.5			330	520	34	. 92	50	156	80	75	86	80
7585860	150	SOLBS BL RF 8"	RF 8"					10 8(803459	12.5	50.0		330	520	34	92	50	56	80	75	98	80
7580218	150	50LBS 50 RF 8"	RF 8"					20 B(803459	12.5	50.0		330	520	34	92	50	156	80	75	98	80
7580202	150	50LBS SO RF 14"	RF 14"					2 B(B03459	12.5	50.0		330	520	34	. 91	50	951	80	75	86	80
7586502	150	SOLBS TH RF 6"	RF 6"					S B(B03459	12.5	50.0		330	520	34	91	20	951	80	75	98	80
7586824	150	SOLBS WN RF STD 4"	I RF STD	4"				50 B(803459	12.5	50.0		330	520	34	. 91	20	951	80	75	98	80
7586832	15(SOLBS WN RF STD	I RF STD	191				30 B(803459	12.5	50.0		330	520	34	9/	50	951	80	75	86	80
7586891	15(SOLBS WN RF STD	I RF STD	184				20 80	803459	12.5			330	520	34	94	50	26	80	75	98	80
7583949	300	300LBS WN RF STD	I RF STD	.8.				10 B(803459	12.5	50.0		330	520	34	192	50	95	80	75	98	80
7585321	150	SOLBS WN RF STD 10"	I RF STD	1.10,1				20 B(803459	12.5	50.0		330	520	34	. 91	50	26	80	75	86	80
								D	Chemical Composition (%)	omposi	tion (%)										NDE	
Heat No./		Ü	72	Min	Д	En.	ž	Ģ	Mo	Ca	>	Nb							30			P
Batch No.	Max		0.300	0.300 0.300 1.350 0.150 0.600		0.035 0.040	0.400	0.300	0,120	0.400	0.080	0.020								5	TM	¥

REMARK * H : Heat Analysis P : Product Analysis

Witnessed by / H. J. LEE

0.412 0.411

0.006 0.007

0.007 0.001

0.017 0.014

0.136 0.138

0.054 0.057

0.002 0.002

0.012 0.011

1,230 1,240

0.163 0.162

Min I

0,224 0.226

B03459

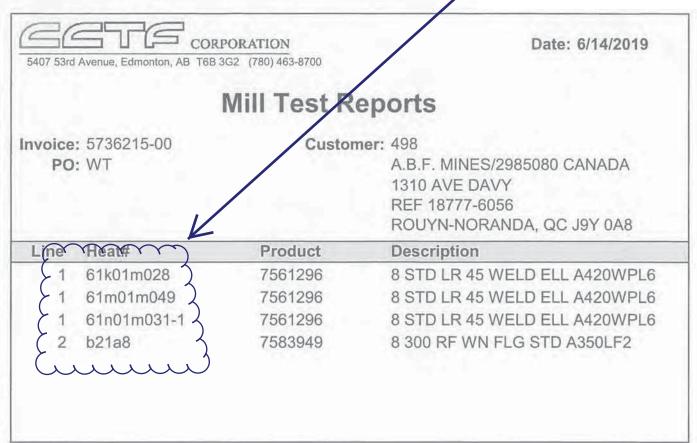
BLANK 0.138 0.147

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

ST-801-14-02

with the above specification and also with the requirements called for by the above order

We hereby certify that the material herein has been made and tested in accordance



CCTF CORPORATION Purchaser:

INSPECTION CERTIFICATE

TO EN10204 3.1

Job No.

A901180-00

BENKAN

58 Soi Watkrunal, Banglera, Prapadaeng, Samutprakara, 10130 Thailand. Thai Benkun Co., Ltd.

34 Z Q

Certificate No.

T- 2018031531

09/11/2018

Dimensional Inspection	Good	Hardness Actual Data	145			HARDMESS MAX 197 HB: GOOD	Impact Test (I)	10 X 6.7 X 2V AT -45 °C		AVE. 127	
Dimen		urdness A	HBW:115-145			IIARDH		AT AT	120	129	131
no		土	I				ы	%	30		41
Visual Examination	Good	Quantity	10			transverse	TS	ai.	415	585	481
	17	Que				*2 Tension Test	YS	MPa.	241		305
spection	6.25-20	(I:41)			m		C.E.	001 100			35
on for In	-2012,B1			Item Na.	7561296		NB	1000		20	-
Specification for Inspection	ASME B16.9-2012,B16.25-2017			Iter	756		>	1000 x		80	+
co.	ASM		D				AI	1000 x			
	87	& Size	45 EL WPL6 8 STD				Mo	001 ×		12	2
Pipe Pipe	SA420-17 Gr.WPLB IMM6C Bour Bunks	Product & Size	S EL WI	Material Heat No.	184740	%	ර	001 x		30	w
n for Ma Seamless	SME SA420		4	Matcria	-	position	Z	001 x		40	4
Specification for Material Made from Seamless Pipe	ASTM A420-16 / ASME					Chemical Composition %	ō	100 x		40	9
Spe	ASTIM A CSAZMS					Chen	63	x 1000		40	to
				14			Д	0001 X		35	69
						9	Mn	100	50	135	105
0,	32		61K01M028				Si	× 001	15	35	72
E-No.	TA-182		61K0				0	100		30	ξ
		MFG, No.					Specifi-	Canon	Min.	Max.	

NORMALIZING 810 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 havin 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.

 $^{\circ}$ 1: "T symbolized wall thickness in mm. $^{\circ}$ 2: YS Vield strength TS = Tensile strength E = Blongstion From T7-6111

Quality Assurance Manager Thai Benkan Co., Ltd.

CCTF CORPORATION Purchaser:

INSPECTION CERTIFICATE

TO EN10204 3.1

Job No.

Purchase Order No. 4901220-00

BENKAN

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

× M Q

Cortificate No.

T- 2018031547 09/11/2018

MFG. No. Friedrich ASTM ARSOL ASTM A		H	E-No.			S	Specification for Material Made from Scamless Pipe	ion for M	aterial is Pipe		V)	Specification for Inspection	ion for Is	spection		Visual Examination	no	Dimens	Dimensional Inspection
No.		TA.	169			ASTIN	1 A420-18 /.	ASME SAM	20-17 Gr.Wil	970	ASN	NE 816.9	1-2012,B	16.25-20	11	Good			Good
Figh	IFG. N	0.							Produc	t & Size				(T:*1)	Õ	uantity	Ta.	rdness Ac	tual Data
Material Heat No. Item No.		B11	AO1 MO4	6	-			12	45 EL M	PLB 8 S	OTT					10	Ĩ	BW:115-1	46
C Si Min P S Cu Ni Cr Mo 100 1000 1000 100 1000 1								Materi	al Heat N	o.		Ite	m Na.						
C Si Min P S Cu Ni Cr Mo AI V Nb C.E. YS TS TS E X								7	8K4597			75	51288						
C Si Mn P S Cu Ni Cr Mo AI V Nb C.E. YS TS E Impostrates in production X X X X X X X X X X X X YS						Che	amical Co	mpositio	% и						e2 Tension Test	transverse		HARDNE	SS MAX 197 HB : G
X X	-ili-	C	Si	Mn	P	52	ð	Z	ਹੱ	Mo	Al	>	NP NP	C.E.	YS	TS	m		mpact Test (J)
15 50 40 40 40 30 12 80 20 241 415 30 161 30 35 135 36 40 40 30 12 80 20 7 585 7 174 AVE. 12 27 128 11 1 0 0 38 286 458 48 183	1001		x 100	×	×	×	×	×			1000	1000	1000		MF		%	AT AT	6.7 X 2V -46 °C
30 35 135 35 40 40 40 30 12 80 20	lin.		15	20											241	415	30	161	
27 128 11 1 2 2 11 1 0 0 38 288 458 48	nx.	30	35	135	35	40	40	40	30	12		8	20			585		174	AVE. 173
		12	27	128	1.	-	2	2	11	4-		0	0	36	286	458	48	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 ANSIANACE MR0175/ISO15158-2 (Region 3) :2015 & MR0103-2015

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

MAGNETIC PARTICLE EXAMINATION FOR THE 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.

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

Runguapa Kamphacou Quality Assurance Manager

Thai Benkan Co., Ltd.