





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

3 141352 2530074 2 A333-6 STD BLK SMLS SRL 4 610879 2530090 4 A333-6 STD BLK SMLS SRL 5 175147 2530104 6 A333-6 STD BLK SMLS SRL 5 178322 2530104 6 A333-6 STD BLK SMLS SRL 6 175142 2530112 8 A333-6 STD BLK SMLS SRL 6 175146 2530112 8 A333-6 STD BLK SMLS SRL	ine	Heat#	3 K	Product	Description
4 610879 2530090 4 A333-6 STD BLK SMLS SRL 5 175147 2530104 6 A333-6 STD BLK SMLS SRL 5 178322 2530104 6 A333-6 STD BLK SMLS SRL 6 175142 2530112 8 A333-6 STD BLK SMLS SRL 6 175146 2530112 8 A333-6 STD BLK SMLS SRL	2	176433	3	2530031	1 A333-6 STD BLK SMLS SRL
5 175147 2530104 6 A333-6 STD BLK SMLS SRL 5 178322 2530104 6 A333-6 STD BLK SMLS SRL 6 175142 2530112 8 A333-6 STD BLK SMLS SRL 6 175146 2530112 8 A333-6 STD BLK SMLS SRL	3	141352)	2530074	2 A333-6 STD BLK SMLS SRL
5 178322 2530104 6 A333-6 STD BLK SMLS SRL 6 175142 2530112 8 A333-6 STD BLK SMLS SRL 6 175146 2530112 8 A333-6 STD BLK SMLS SRL	4	610879	2	2530090	4 A333-6 STD BLK SMLS SRL
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6 177833 2 2530112 8 A333-6 STD BLK SMLS SRL	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	0			RINA 10 rest 100/13 1	RINA 190 received recovered to the received recovered re		Z	Inspect (According No.: 0030030837 / 00	1 (00308:	nspec According 37 / 00	tion C	Inspection Certificate (According to DIN EN 10204.3.1)	Sheet 2 / a
Chemical Composition (%)	(%)					rocess:	Basic Ox	Process: Basic Oxygen Furnace, heats fully killed	sace, hea	ts fully k	illed									
Ceq: CSA-Z245.1-CE11					Ceq	C+Mn/6	+(Cr+Mc	C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15	ii+Cu)/L		CE	1: Cr+C	CE1: Cr + Cu + Mo + Ni + V	N: + V						
		3	Mn	D.	05	35	ž	Cr	Mo	AI C	Cu v	Nb	8	T	Z	C3	Ceg	Ceq	CEI	
Heat Analisys	Min		0,400			001'0														
	Max	0,240	1,350	0.025	0,025	0,500	0,400	0,300 0,	0,120	0,0	0,400 0,080	80 0,020	010000 07	0 0,110			0,400	0,430	1.000	
Product Analisys	Min		0,400			0,100														
	Max	0,240	1350	0,025	520'0	0,500	0,400	0,300 0,	0,120	0,4	0,400 0,080	80 0,020	0100'0 07	0 0,110			0,400	0.430	1,000	
Heat Control Lot																				
176433 030003101210		0,10	1,27	0,012	0,004	0,28	0,03	0 90'0	0,01 0,0	0,029 0,0	0,070 0,004	04 0,015	15 0,0004	4 0,002	6600'0	0,0012	0,265	0,333	0,174	
Check 1		0,11	1,29	0,011	0,004	0,29	60,03	0 90'0	0,01 0,0	0,029 0,0	0,074 0,005	710,0 80	7 0,0003	3 0,002	8600'0	0,0013	0,277	0,347	0,179	
Check 2		0,10	1,29	0,011	0,004	0,29	0,03	0 90'0	0,01	0,029 0,0	0,074 0,005	710,0 20	7 0,0003	3 0,002	8800'0	0,0013	0,267	0,337	0,179	
Ceg: Carbon Equivalent; Ceg: Carbon Equivalent; CE: Combined Elements;	q: Carbon	Equivale	nt; CE: C	ombine	I Eleme	its;										100				
Tensile Test																				
Specimen Direction: Longitudinal	inal				Tem	perature	Room	Temperature: Room Temperature	υ		Wa	II Thickn	Wall Thickness: 3,38 mm	mm			Gag	Gage Length: L0=2"	r: L0=2"	
Method: Elong. Total Under Load 0,50 %	oad 0,50 %																			
							Fype of S	Type of Specimen			Area		YS		TS					
											(MM2)	6	(MPA)	_	(MPA)	(%)				
			Requir	Required: Min									290		415	25	.5			
				Max											625					
Hear Control Lot																				
176433 030003101210							FULLS	FULL SECTION			321,3	ma	349		477	44				
							FULLS	FULL SECTION			330,4		355		490	45	ie.			
VS-Yield Strength; TS-Tensile Strength; E-Elongation;	e Strength;	E-Elong	ation;																	
Hardness Test Through Wall	Wall																			
Scale: HV																				
		Indiv	Individual																	
Required: Min	Win																			
	Мах	24	246,0																	
					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:	55°C			50	riker radiu	s: 8 mm
		AEI	AEI AEZ AE3	AE3	AE4		AEAvg	SA1	SAZ	SA3	SA4	SAS	SA Avg	LEI
		(5)	(2)	(r)	5	6	(%) (%) (f)	(%)	(%)	(%)	(%)	(%)	(%) (%) (%)	(Mils)
	Required: Min	7	7	7			7	20	50	20			0.9	
	Max													
Heat Control Lot														
176433 030003101210		52	99	55			54	100	001	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: 50978-440 MANUFACTURIS 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: Mn/C	10/1											
		c	Min	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	1,372	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. MATIBILAL 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. GUSTANO ALVIS PLANEROS CREAMAGAIGATONIO

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.:

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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: + 49.5254.13866

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 constraintempe aur ditiquate . FS = Pabgastempe, die stanp, marquage par peinture . FSD = Farbschaung, ink jel spray marking, mortimante à jel constraintempe aur ditiquate . FS = Pabgastempe, die stanp, marquage par peinture . FSD = Farbschallung, ink jel spray marking, mortimante à jel constraintempe aur ditiquate . FSD = Farbschallung, ink jel spray marking, marquage par peinture . FSD = Farbschallung, ink jel spray marking, marquage par peinture . FSD = Farbschallung, ink jel spray marking, marquage par peinture . FSD = Farbschallung, ink jel spray marking, marquage par peinture . FSD = Farbschallung, ink jel spray marking, marquage par peinture . FSD = Farbschallung, ink jel spray marking, marquage par peinture . FSD = Farbschallung, ink jel spray marking, marquage par peinture . FSD = Farbschallung, ink jel spray marking, marquage par peinture . FSD = Farbschallung, ink jel spray marking marquage . FSD = Farbschallung, ink jel spray marking marquage . FSD = Farbschallung, ink jel spray marking marquage . FSD = Farbschallung, ink jel spray marking marquage . FSD = Farbschallung, ink jel spray marking marquage . FSD = Farbschallung, ink jel spray marking marquage . FSD = Farbschallung, ink jel spray marking marquage . FSD = Farbschallung, ink jel spray marking marquage . FSD = Farbschallung, ink jel spray marking marquage . FSD = Farbschallung, ink jel spray marking marquage . FSD = Farbschallung, ink jel spray m 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.	in.	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

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03 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		

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Pos.

Steel/Tube

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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	mayenne	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	%	%	THE THE	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.:

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Steel/Tube

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> 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	Đ(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	тоувине	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

33043 Paderborn Postfach 13 40

Tel.: + 49.5254,81-0 Fax: + 49.5254,13666 Deutschland

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

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Steel/Tube

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

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

Es wird bestätigt, daß die gelieferten Erzeugnisse den techn. Lieferbedingungen des Auftrages entsprechen. Dieses Dokument wurde mittels EDV erstellt und ist ohne Unterschrift rechtsgültig. We certify that the supplied products comply with the order specifications. This document was prepared by means of electronic data processing and is valid without signature.

Nous attestons que les produits 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 0,002 0,007 0,001 0,001 0,001 0,002 0,001 0,002 0,007 0,001 0,001 0,001 0,001 0,002 0,001 0,002 0,007 0,001 0,001 0,001 0,002 0,001 0,002 0,007 0,001 0,001 0,002 0,001 0,002 0,007 0,001 0,001 0,002 0,001 0,002 0,007 0,001 0,001 0,002 0,001 0,002 0,007 0,001 0,001 0,002 0,001 0,002 0,007 0,001 0,001 0,002 0,001 0,002 0,007 0,001 0,001 0,001 0,002 0,001 0,002 0,007 0,001 0,001 0,002 0,001 0,002 0,007 0,001 0,001 0,002 0,001 0,002 0,007 0,001 0,001 0,002 0,001 0,002 0,007 0,001 0,001 0,002 0,001 0,002 0,001 0,001 0,001 0,002 0,001 0,002 0,001 0,001 0,001 0,002 0,001 0,002 0,001 0,001 0,001 0,001 0,002 0,001 0,002 0,001 0,001 0,001 0,001 0,002 0,001 0,001 0,001 0,001 0,001 0,001 0,001 0,002 0,001 0,001 0,001 0,001 0,001 0,001 0,001 0,001 0,002 0,001 0,00	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					ĺ	
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 STRIP WIDTH 25,4 MM (189.2 373 492 492 STRIP WIDTH 25,4 MM (189.2 373 492 492 STRIP WIDTH 25,4 MM (189.2 355 488 399	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 (189,2 373 499 STRIP WIDTH 25,4 MM (189,2 373 498 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)	(
### STRIP WIDTH 25,4 MM 188.5 376 500 STRIP WIDTH 25,4 MM 188.8 371 486 STRIP WIDTH 25,4 MM 186,2 369 500 STRIP WIDTH 25,4 MM 188,8 370 489 STRIP WIDTH 25,4 MM 189,2 373 492				Rec	uired: N	lin in								190		415	m	-				
STRIP WIDTH 25,4 MM 188.5 376 500 STRIP WIDTH 25,4 MM 190.0 382 505 STRIP WIDTH 25,4 MM 186,2 369 570 STRIP WIDTH 25,4 MM 189,2 373 489 STRIP WIDTH 25,4 MM 189,2 373 492 STRIP WIDTH 25,4 MM 189,2 373 492 STRIP WIDTH 25,4 MM 189,5 355 488					W	3.5										625						
STRIP WIDTH 25,4 MM 188.5 376 500 STRIP WIDTH 25,4 MM 190.0 382 505 STRIP WIDTH 25,4 MM 186,2 369 500 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 185,5 355 488																						
STRIP WIDTH 25,4 MM 188.8 371 486 STRIP WIDTH 25,4 MM 186.2 369 505 STRIP WIDTH 25,4 MM 189.2 373 489 STRIP WIDTH 25,4 MM 189,2 373 492 STRIP WIDTH 25,4 MM 189,5 355 488 STRIP WIDTH 25,4 MM 186,5 355 488	175147 0300031400.	17					20	TRIP WI	21H 25,4			188	45	376	100	200	च					
STRIP WIDTH 25,4 MM 188,8 371 486 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							U)	TRIP WI	STH 25.4	MM		190	0	382		505	ব					
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	90	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	90	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	(1)					
							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. E5-1			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	>	NB	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

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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	1,62	LE3	LE AVE
		(3)	(3)	(4) (5) (3)	(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	104			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 MIGHOS 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.1.6.290 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 DO 160/11 (1848) ISO 14601 CO 200011 (C)	IA 150 zanii osida tene orogenesi žetene	9		No.: 0	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 (0,000,0	0,015 0,0	0,00004 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	60000	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		H			
										(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)			
					con.	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			
					En .	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

(Mills)

(%)

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

82 82

78 82 88

8 82 80

100

100 80 10

90

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 - 17

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	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 Temperature: Room Temperature 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 329.7 399 515 40 STRIP WIDTH 38.1 MM 305.2 420 519 42 STRIP WIDTH 38.1 MM 305.2 420 519 42 STRIP WIDTH 38.1 MM 305.7 425 525 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 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 AB5 A	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) (AIPA) 290 415 415 495 625 625 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 300,7 425 525	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										(NE	(12)	Valle)	-	(MPA)	Û	(9)		
STRIP WIDTH 38 MM 329.7 383 502 STRIP WIDTH 38.1 MM 305.2 420 519 STRIP WIDTH 38.1 MM 306.7 425 525		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		O. Harrison	The second				Section 1		-								
Test Specimen: CHARPY 10X55X75 V NOTCH		Direct	Direction: Longitudinal	udinal			Tem	Temperature: -16°C	2591-			F.	Striker radius: 8 mm	St S mm			
		AEI	AE2	MER	MA	VES	AE Avg		SA2	8.4.3	11.4	8.4.5	S.A. Avg.	137	1,152	CER	LE Avg
		6)	(1)	(3)	(1)	(1)	(1)	(%)	(%)	(2%)	(%)	(%)		(MIIN)	(SHIS)	(MIIN)	(MHS)
	Required: Min 21	<u>e</u>)	FI	23			FI	20	50	30			00				
	Man																
Heat Control Lot																	
175146 030003113164		270	275	292			269	100	1001	100			1001	7.8	18	200	80
177833 030003140903		27.5	363	270			692	100	100	100			100	71	70	69	7.3
AE - Absorbed Energy: S.A - Shear Aren: L.F Lateral Expansion:	teral Expansion:																
Impact Test																	
Test Specimen: CHARPY 10X35X6.67 V NOTCH		Direct	Direction: Iransverse	erse			Tem	Temperature: 46°C	2591-			15	Striker radius: 8 mm	81.8 mm			
		AEI	AE2	AEX	AE4	AES	AE Avg	IVS	2VS	8.43	8,44	5.A.5	SAAVE	LEI	1.62	LE3	LE AVE
		(7)	(7)	(7)	(1)	(11)	(1)	(%)	(%)	(%)	(%3)	(%)	(%)	(Mils)	(Milk)	(Mills)	(Mills)
	Required: Min	×	35	×				50	8()	1)%			160				
	Max																
Heat Cantrol Lot																	
177833 030003140903		210	186	17.1			0.1	100	100	100			1001	XX XX	87	SK	NN NN
AE - Absorbed Found: SA - Shear Area: LE - Lateral Expansion:	deral Expansion:																

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/EUL AINNEX FERE, 4.3 (CTRETPICATE 2016/EUL MP 02-03 VALID UNTIL 12.05.2019).

- MATIGUAL ACCORDING TO PRE 2014 68 UP ANNEX UPAR 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 - 18 ASTM A 530M - 18 ASTM A 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 #





peet/2/4

vallourec	O					M.	EcoTube	9			RINA no test no to cortect no too	RINA so too; soor outs soor contest contest soor		-	Inspect (According N°.: 0030030841 / 00	300308	Inspec Accordir 141 / 0	tion (Inspection Certificate (According to DIN EN 10204.3.1) 841 / 00	Sheet
Chemical Composition (%)	(%) 10					Process	Basic O	xygen Fu	Process: Basic Oxygen Furnace, heats fully killed	ats fully	killed									
Ceq; CSA-Z245.1-CE11					3	C+Mn/	6+(Cr+N	0+V)/5-	Ceq: C+Mn/6+(Cr+Mo+V)/5 -(Ni+Cu)/15	25	0	CE1: Cr + Cu + Ma + Ni + V	Su - Mo	+ Ni + V						
		0	Ma	۵	S	S	ï	Ľ	Mo	Al	Cu	V .	Nb B	T	Z	S	Ceq	Ceq	CEI	
Heat Analisys	Min		0,400			001,0														
	Max	0.240	1,350	0,025	0,025	0,500	0,400	0,300	0,120	0	0,400 0,	0,080,0	0,020 0,0010	0110 0110	0		0,400	0,430	1,000	
Product Analisys	Min		0.400			0,100														
	Max	0.240	1,350	0,025	0,025	005'0	0,400	0,300	0,120	0	0.400 0,	0,080 0,0	0,020 0.00	0.0010 0.110	01		0,400	0,430	1,000	
Heat Control Lot																				
175141 030003103023		0,10	1,28	600'0	0,003	0,27	20'0	50'0	0,01 0,	0,026 0,	0,028 0,	0,001 0,0	0,016 0,0	0,0005 0,001	0700,0 10	6100'0 0	0,262	0,329	0,109	
Check I		0.10	1,26	8000	0,003	0.28	0,02	0,04	0'01 0	0,026 0,	0,030 0,	0,004 0,0	0,015 0,0	0,0003 0,001	11 0,0065	5 0,0016	0,258	0,324	0,104	
Check 2		0,11	1,28	8000	0,002	0,28	0,02	0,04	0.01 0,	0,026 0,	0,031 0,	0,004 0,0	0,016 0,00	0,000 2000,0	11 0,0065	5 0,0016	0,270	0,338	0,105	
175142 030003103024		0,11	1,29	0,010	0,004	0,28	0,02	0,05	0 (0'0	0,030 0.	0,025 0,	0,001 0,0	0,015 0,0	0,0004 0,002	7700,0 20	9100'0 4	0,283	0,340	0,106	
Check 1		0.13	1,28	110'0	0,003	0.28	0,03	90'0	0 10'0	0,031 0,	0,021 0,	0,005 0,0	0'0 910'0	0,0003 0,002	2700,0 20	2 0,0013	0,283	0,342	0,126	
Check 2		0,11	1,29	600'0	0,003	0,28	0,02	0,04	0,01 0,	0,029 0,	0,025 0,	0,004 0,0	0,015 0,00	0,0003 0,002	2700,0 21	5 0,0014	0,281	0,339	660'0	
176433 030003103452		0,10	1,27	0,012	0,004	0,28	0,03	90'0	0,01 0,0	0,029 0,	0,070,0	0,004 0,0	0,015 0,0004	304 0,002	66000 20	0,0012	0,265	0,333	0,174	
Check I		0,11	1,29	0,013	0,004	0,29	0.03	90.0	0,01 0,0	0,028 0.	0,066 0,	0,005 0,0	0,016 0,0	0,0003 0,002	960000 70	5 0,0013	0,277	0,346	0,171	
Check 2		0,11	1,26	0,013	0,004	0,28	0,03	90'0	0,01 0,0	0,028 0,	0,066 0,	0,005 0,0	0,016 0,0002	200'0 200	96000'0 20	5 0,0013	0,273	0,341	171,0	
Ceg: Carbon Equivalent; Ceg: Carbon Equivalent; CE: Combined Elements;	Ceq: Carbo	n Equiva	lent; CE	Combit	ed Elem	enfs;										d				
Tensile Test																				
Specimen Direction: Longitudinal	tudinal				Ten	nperatur	е: Коот	Temperature: Room Temperature	ore		W	Wall Thickness: 8,18 mm	ness: 8,1	s mm			Ca	ge Lengt	Gage Length: L0=2"	
Method: Elong. Total Under Load 0,50 %	r Load 0,50	20																		
							Type of	Type of Specimen			Area	OI.	VS		TS		B			
											(MMZ)	(2)	(MPA)		(MPA)	٥	(%)			
			Requ	Required: Min									290		415	(61	35			
				Max	н								495		979					
Heat Control Lot																				
175141 030003103023						S	TRIP WI	STRIP WIDTH 38,1 MM	MM		336,8	00	360		472	9	41			
						in	TRIP WI	STRIP WIDTH 38,1 MM	MM		348,7	7	389		455	4.	40			
175142 030003103024						in	TRIP WI	STRIP WIDTH 38,1 MM	MM		318,9	5	395		205		42			
						S	TRIP WI	STRIP WIDTH 38,1 MM	MM		330,1	7	401		490	-	40			
176433 030003103452						òs	TRIP WI	STRIP WIDTH 38,1 MM	MM		328,0	0	396		808	-	43			
						S	TRIP WI	STRIP WIDTH 38,1 MM	MM		341,8	20	410		495	ч	40			
YS-Yield Strength; TS-Tensile Strength; E-Elongation:	asile Strengt	1; E-Elon	gation:						ł											





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

158.0 162,0 0'691 175141 030003103023 175142 030003103024 76433 030003103452 Control Lot Heat

164.0 0'091

0'0/1

Temperature: 46°C SAI AE AVE AES AE4 AE3 Direction: Longitudinal AE2 AEI Test Specimen: CHARPY 10X55X7.5 V NOTCH Impact Test

LE AVE (Mills)

LES

LE2

LEI

SA Avg (%)

SAS (%)

SA4

SA3 (%)

(%)

(%)

(%)

(F)

5

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

00 100

100

100

100

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

175142 030003103024

176433 030003103452

175141 030003103023

Heat Control Lot

AE4 AE3 Direction: Transverse AEZ AE1

Test Specimen: CHARPY 10X55X6.67 V NOTCH

Impact Test

> Required: Min Max

213 208 196

187 203

156 187

190

100 100 100

001 00

100 100

100

100

75 82 80

22 23 23

78 82 80

8 78 22

LE AVE

(MIIs)

(Mils) LE3

(Mils) LEZ

(Mils)

(%) 09

(%)

(%)

(%)

20

LEI

SAAVE

SAS

SAA

SA3

SAZ (%)

SAT

AE Avg

AES

(%)

5

20

Temperature: 46°C

Striker radius: 8 mm

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

vallourec

Voltouree Soluções Tubulanes do Brasil S.A. Barreiro Plant - Av. Offinto Mejieles, 65 ZIP, 306-10-010 - Belo Horromte, MG



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

Sheer 1 4

Customer: VALLOL/REC CANADA INC

Country: Cambi

Material Number: 274/54
Work Order: 534782 / 80
Cuxomer Order: VM-4748 - P.O. 4058835-40

Inspection: Valloune Solucões Tobulures 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/+1.33 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 ASTALA ASMESA 106 B 16300 KPA WEIGHT ASTALA 50 B NPS 8" X SCH 40 VSB LOGO

SHIPPING MARKING: NACE MR 0175/NACE MR 0103 - MADE IN BRAZIL * VM4748 / P.O.# 4038825-00/11EM-8 * TORONTO * CCTP

Pieces	5)	95	30
Heat	175146	(77833	T. Carrier

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 N°.: 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 Ni Ni Ti N C3 C7 C7 Ni Ni Ti N C3 C7 Ni Ni Ti N C3 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 Furi	race, lica	us bully	lilled									
NS Cr Min M Ch N Nh H Ti N Ch Ch	Ceqr CSA-X245.1-CE11					Ceq	: (- Nu	N-CF-M	A-217-4	SECONT.	100		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 0.100 0.120 0.4000 0.0000 0.0000 0.100 0.110 0.120 0.4000 0.00000 0.00000 0.0000 0.0000 0.00000 0.00000 0.00000 0.00000 0.0000 0.00	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	Method: Elong, Total Under	Lund (1,50 %.																			
Required; Min CMPA CMPA CMPA Man								Type of	уресінген			Area		5.1		SJ	77				
Required; Min 290 415 Man												ININ	(1)	(MIPA)	()	IP.N)	3	-			
Man, STRIP WIDTH 38 MM STRIP WIDTH 38,134,3 STRIP WIDTH 38,134,3 STRIP WIDTH 38,134,3 STRIP WIDTH 38,134,4 STRIP WIDTH 34,134,4 STRIP WIDTH 34,134,				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(12	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, L3	IV)		305.2	925	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	8.13	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	$\frac{z}{z}$	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 BRAZIL

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	Di Goda	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
7580899	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	Cu	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

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A W W W

mmem

13 7 13

17 16 16 27

12 12 13

10 10 m

73

46722

197

30 8

> 60000 95000 66700

35000 P.S.I

8

P.S.1

X100

X1000 X1000

X100

X100

X100

X100

X1000 X1000

X100

X100 13 40

X100

Assummee Section Chief of Quality

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

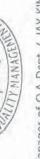
				Size o	Size of Test		ensio	Tension Test		H	Hardness		Charpy II	mpact Te	St
			the state of	Spec	Specimen	>	S	S	RA		Fest	(10)	(10mm)	(10X10mm Specimen Size)	Size)
	ITEM / SIZE	Q'ty	Heat No./	٥	15	M	_	Pa %			(HB)	Indiv.	Ave.	Notch	Temp.
				mm.	mm		-	55			187	163	207	>	-
				12.5	50.0	Min 2		485 22.0	0 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	8		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. Máx 0.300 0,300 1.350 0.035 0.040 0.120 0.080 0.080 0.020 0.020 0.040 0.0400 0.080 0.020 0.020 0.077 0.005 0.017 0.004 0.001 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.	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		5	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 0.019 0.077 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

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	st		lardne	52	Ç	arpy Im	Charpy Impact Test	11	
				Spec	Specimen		V.S	T.S	EL	R.A	Test		(10X1	10X10mm S	Specimen Size)	Size)	
	ITEM / SIZE	0,15	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 2	22.0 3	30.0			Test	Result	(1)	Ave.(J)	
7585585	150LBS BL RF 6"	40	S08101C	12.5	50.0		339	525	34	78 1	59 1	62	188	165	195	183	
7585666	300LBS BL RF 8"	25	508101C	12.5	50.0		339	525	34	78	59 1	62	188	165	195	183	
7580185	900/1500LBS SW RF S160 2"	20	508101C	12.5	50.0		339	525	34	78	59 1	62	188	165	195	183	
7580219	150LBS SO RF 10"	20	508101F	12.5	50.0		339	525	34	78 1	59 1	162	188	165	195	183	÷
7586507	150LBS SO RF 3"	50.	508101F	12.5	50.0		339	525	34	78	59 1	29	188	165	195	183	
7586508	150LBS SO RF 4"	25	508101F	12.5	50.0		339	525	34	78	59 1	29	188	165	195	183	
7586509	150LBS SO RF 6"	70	508101F	12,5	50.0		339	525	34	78	59 1	29	188	165	195	183	
7580218	150LBS SO RF 8"	25	508101F	12.5	50.0		339	525	34	78	59 1	29	188	165	195	183	
	BLANK		BLANK					BLAN	×		BLAN	2					

								Ch	emical	Compos	Chemical Composition (%)				NDE	
Heat No./		u	15	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
			Ave.	60	51.33	140	174.67		ARK		
Jon			otch	62	22	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 mm	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	45	-45	-45	559			-
			MT	20.00	PASS	PASS	PASS	Hardn	Tes	НВ	
spection	55		No.			100	006		i.i.	%	
Visual In	ρĄ		Certificate	1289-1	1281-1	03080005	304040002	ensile Test	T.S	P.S.1	
			v Material	VG C20184	NG C20184	L BGSAG18	L BGSQG18	=	γ.5	P.S.I	
F			Rav	HENGYAL	HENGYA	BAOSTEE	BAOSTEE		C.E	X100	
100			t No	8867	V688 V688	2248			NB	X1000	
nspect	2015			1834	1834	1832	342		>	X1000	
ion for	E 816.9		Heat ID	V886V	8850	A248	E274		Mo		
ecificat	ASM		ntity	SO C	0. 25	00	7	%uo	ŭ	X100	
Sp			Qua	m i	- m			mpositi	ž	X100	
					7 6			ical Co	D.	X100	
	333-6			9	4 4 X X	9	00	Chem	S	X1000	
	E FOR A		ription 154	288	7907	938	846		۵	X1000	
aterial	EN PIP		Desc			-			Mn	X100	
Raw M	R.B/GRE			WPLG	WPL6	Te xS	L6 XS		Si	X100	
	4106 GF			45 E L/F	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 Office of specimen 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 Description Quantity Heat No Raw Material Certificate No. NT Test Size of specimen Charpy V-Notch Impact Value 75-A mm J	Raw Material Specification for Inspection Visual Inspection Visual Inspection Dimensional Inspection A 106 GR.B/GREEN PIPE FOR A333-6 ASME B16.9-2012 PASS PASS PASS Description Quantity Heat ID Heat No Raw Material Certificate No. NDE Test Size of specimen Charpy V-Notch 75 LA ASE L/R WPL6 STD 12.88 6 35 886V 1834886V HENGYANG C201841289-1 C mm J	Raw Material Specification for Inspection Visual Inspection Visual Inspection Offmensional Inspection Offmensi	Raw Material Specification for Inspection Visual Inspection Visual Inspection Visual Inspection Olimensional Inspectional Inspection Olimensional Inspection Olimensional Inspectional I	A 106 GR.B/GREEN PIPE FOR A333-6 ASME B16.9-2012 PASS PAS	A 106 GR. B/GREEN PIPE FOR A333-6 A 5ME B16.9-2012 PASS P	The material The	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

31 31 27 27 31

4444

9999

HNNAA

11 11 11 9 6

100 100

31 31 31 18 15 18

13 13 15

74

in in in

V

777

49044

134-135

35.5

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

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 Peat No. Peat No					Size of	f Test		Tens	Tension Test	st	-	Hardness		harpy In	spact Tes	3.t	
TEM / SIZE				1	Spec	imen	Ī	Y.S	T.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		_	_		50	(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					12.5	20.0	Min		_	-	0.	,	Tes	st Result	(1)	Ave.(J)	1
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	7585860	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	7585640	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"	N	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	3	50 155	136	154	142	144	
		BLANK		BLANK					BLAN	X		BLANK					

								Ch	emical (Compos	Chemical Composition (%	6			NDE	
Heat No./		Ų		Mn	۵	S	Ni	ò	Mo	Cu	>	NP	93			
Batch No.	Max	0.300	0.300	200	0.035	0.040	0.400	0.300	0,120	0.400	0.080	0.020		5	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

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	15					%	(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	15(SOLBS BL RF 6"	RF 6"					20 B(803459	12.5			330	520	34	. 92	50	156	80	75	86	80
7585860	15(SOLBS BL RF 8"	RF 8"					10 8(803459	12.5	50.0		330	520	34	92	50	56	80	75	98	80
7580218	15(50LBS 50 RF 8"	RF 8"					20 B(803459	12.5	50.0		330	520	34	92	50	156	80	75	98	80
7580202	15(50LBS SO RF 14"	RF 14"					2 B(B03459	12.5	50.0		330	520	34	. 91	50	951	80	75	86	80
7586502	15(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	JLBS WA	SOLBS WN RF STD 4"	4"				50 B(803459	12.5	50.0		330	520	34	. 91	20	951	80	75	98	80
7586832	15(JLBS WA	SOLBS WN RF STD	191				30 B(803459	12.5	50.0		330	520	34	9/	50	951	80	75	86	80
7586891	15(JLBS WA	SOLBS WN RF STD	184				20 80	803459	12.5			330	520	34	94	50	26	80	75	98	80
7583949	300	JLBS WA	300LBS WN RF STD	.8.				10 B(803459	12.5	50.0		330	520	34	192	50	95	80	75	98	80
7585321	150	DLBS WA	SOLBS WN RF STD 10"	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	172	Min	Д	En.	ž	Ģ	Mo	Ca	>	Nb							30			P
Batch No.	Max		0.300 0.300 1.350 0.150 0.600	1.350		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 0.001

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

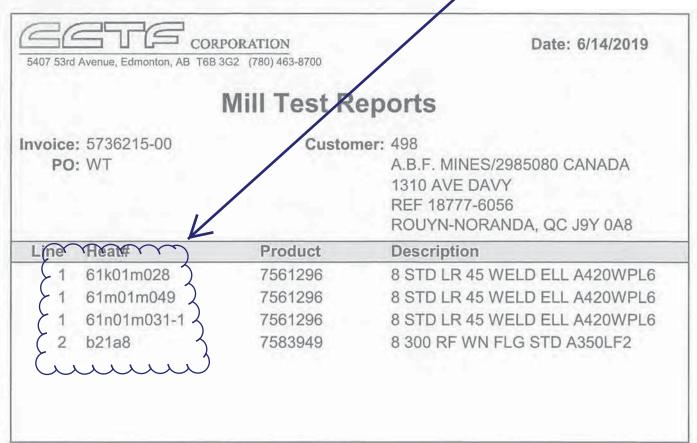
BLANK 0.138 0.147

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		30	w
n for Ma Seamless	SME SA420 CAT I MASC		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
						Į.	Mn	100	50	135	105
0.	82		61K01M028				Si	× 001	15	35	24
E-No.	TA-162		61K0				0	100		30	ট
		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 ASMESNATION ASMES		阳	E-No.			S	Specification for Material Made from Scamless Pipe	ion for M	aterial is Pipe		J.	Specification for Inspection	ion for Is	spection		Visual Examination	no	Dimens	Dimensional Inspection
No.		TA	169			ASTIN	1 A420-18 /.	ASME SA4	20-17 Gr.Wil	916	ASh	NE 816.9	1-2012,B	16.25-20	17	Good			Good
Figh	IFG. N	.0						- 1	Produc	t & Size				(T:*1)	Õ	uantity	훈	rdness Ac	tual Data
Material Heat No. Item No.		B11	AO1 MO4	6				197	45 EL M	PLB 8	OTIS					10	I	BW:115-1	99
C Si Min P S Cu Ni Cr Mo 1000								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 Impact Transford X X X X X X X X X X X X X YS YS <td></td> <td></td> <td></td> <td></td> <td></td> <td>Che</td> <td>amical Co</td> <td>mpositio</td> <td>%и</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>e2 Tension Test</td> <td>transverse</td> <td></td> <td>HARDNE</td> <td>S MAX 197 HB : (</td>						Che	amical Co	mpositio	%и						e2 Tension Test	transverse		HARDNE	S MAX 197 HB : (
X X	ccifi-	0	Sł	Mn	Ъ	22	ð	ïZ	ర	Mo	Al	>	NP NP	C.E.	YS	TS	ш		mpact Test (J)
30 35 40 40 40 30 12 80 20 36 415 30 161 12 27 128 11 1 2 11 1 1 0 0 38 286 458 48 183	1001		x 100	×	×	×	×	×			1000	1000	1000		MF		%	to X	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	-		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.

CCTF CORPORATION Purchaser:

INSPECTION CERTIFICATE

TO EN10204 3.1

Job No.

Purchase Order No. 4801278-00

BENKAN

58 Soi Watkrunsi, Bangkru, Prapadaeng, Samuiprakara, 10130 Thailand. Thai Benkan Co., Ltd.

Certificate No. 5 × A

T. 2018031649

11/12/2018

TA-194 Astro-16 A		щ	E-No.			N.S.	Specification for Material Made from Seamless Pipe	on for Ma Seamless	terial Pipe		S)	pecificat	ion for Ir	Specification for Inspection		Visual Examination	Q.	Dimensi	Dimensional Inspection
Hand		TA	1-194			ASTM	1 A420-16 / J	ASME SAA2	Sour Service	976	ASN	/E 816.	9-2012,B	116.25-20	710	Good			Good
Figure F	MFG. N	.0.							Produc	t & Size				(T:*1)	8	usntity	Ŧ	irdness Ac	tual Data
The match The		81h	101M031	Ξ					45 EL W	PL685	OTS					9/10	İ	BW:115-1	45
C Si Min P S Cu Ni Cr Mo Ai V Nb C.E. YS T Si Si Si Ni Cr Ni Cr Mo Ai N Nb C.E. YS T Si Si Si Si Si Si Si								Materia	Heat N	6		Ite	en No.						
C Si Min P S Cu Ni Cx Mo AI V Nb C.E. Y S Tension Test <									185081			75	181286						
C Si Min P S Cu Ni Cr Mio Ai V Ni C.E. YS TS TS B Impert Test C TS Si TS Si TS Si TS Si TS Si TS TS						Che	mical Cor	mposition	%1						*2 Tension Test	transverse		HARDNES	8 MAX 197 HB : GOO!
X X	Specifi-	S	Si	Mn	Д	62	Ca	Z	Ö	Mo	Al	^	Ne	C.E.	YS	TS	四	d	opact Test (J)
30 35 135 35 40 40 40 72 1 1 1 36 309 480 40 70 12 1 1 36 309 480 40 120 40 40 40 40 40 40 40 40 40 40 40 40 40	сапоп		×	×	x 1000	×	100	100	100	100	1000	1000	1000		M	Pa.	%	AT AT	7.5 X 2V
30 35 135 35 40 40 40 30 12 80 20 7 585 7 118 AVE.	Min.		13												241	415	30	115	
25 108 10 4 6 4 5 2 1 1 1 36 309 480 40	Max.	30	35		35	40	40	40	30	12		80	20			585		118	
		16	25		10	4	0	4	ເນ	2		-	T	36	309	480	40	120	

NORMALIZING 910 C X 40 MINUTES. COOLED IN STILL AIR

The material meet ANSINVACE MR0175/18015156-2 (Region 3) :2015 & MR0103-2015

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.

C.E. = C+Mu/6+(Cr+Mo+V)/5+(NH-Cu)/15

MAGNETIC PARTICLE EXAMINATION FOR TEE ONLY:

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

* 1: T symbolized wall thickness in mm. * 2: YS Yield strength TS = Tensile strength B = Blongstion Form TZ-63/1

Quality Assurance Manager Thai Benkan Co., Ltd. Rungsapa Kempiraton

HEAT: b21a8 CCTF Sku: 7583949 8 300 RF WN FLG STD A350LF2 Invoice: 5736215-00 PO: WT 6/14/2019 9:51:10 AM

CCTF CORPORATION (ONTARIO) 4151 NORTH SERVICE RD. BURLINGTON, ONTARIO CLIENTE / Customer / Client L7L4X6 - CANADA LIND

CERTIFICADO DE INSPECCION UNE EN 10204.06 / 3.1 Inspection Certificate - Certificat de Réception ISO 10474.15 / 3.1

196066 Z S 27/06/2018

FECHA:

Date:

N HOJA: Page

ULMA FORJA, S.COOP.

20560 ONATI (Gipuzkoa) SPAIN E-mail: ulma@ulmapiping.com B" Zubillaga, 3 - Apdo. 14 Tel.: 34 - 943 780552 Fax: 34 - 943 781808

SGI 6000236 by TÜV Rheinland PED 14/68/UE

Packing 140699

QUALITY ASSURANCE

DEPARTAMENTO

MARCA DEL FABRICANTE N.º 01 202 E/O 02 7443 Marque du fabricant Mark of factory

Certilled acc. PED 97/23/EC+AD2000-WD Management Systems certified by LRQAE

of. - dc 28/05/2018

43038605-00 TORONTO

SU PEDIDO N.º

FLANGES

PRODUCTO

Your Order No.

ASME B16,5-17

NORMAS APLICABLES
Requirements - Normes Applicables

DE

Département

NACE MR0175/ISO15156-02/03-15 & NACE MR0103/ISO1749S-15 Clause 7.2.1.4, Annex A.2 and SSC Region 3. CSA-2245.12-17 GR248 CAT II-SS (WN & BLIND FLANGES ONLY)

MATERIAL CORRESPONDIENTE ASME SA350LF2CL1-2-17, ASTM A350LF2CL1-2-17

Steel Making - Etaboration de l'acier

MODO DE FUSION (')

Y = Oxigeno básico

E = Elec.

DUPEZA 52 156 150 151 Durele HBW 200 147 CHARPY V 10x10mm 65 67 67 67 67 67 67 67 67 RESILIENCIA Impact test Résilience 63 57 77 50 50 69 60 775 89 80 80 Elongation 58,20 66,70 60,70 67,30 69,80 70,10 62,80 Red. Area Striction 26,00 30,20 30,20 33,30 29,80 32,60 38,10 COLADA N. PRESISTENCIA LINTE ELAST 320 308 304 304 307 298 298 297 319 T.Strength Y.Strength 0.2 % N/mm2 Rosist Rupt 517 522 507 507 517 Nmm2 N.ºCoulée Heat No **69AV8** 97AV8 B21A8 25AV8 B64A7 OBSERVACIONES Remarks Observations 22222222 02M18G 167816 06J803 19017 LOTE DESCRIPCION Description Description WN 1.1/2 150LB XS/80 RF A350LF2 WN 8 300LB STD/40 RF A350LF2 BLIND 16 150LB RF A350LF2 BLIND 16 150LB RF A350LF2 BLIND 14 150LB RF A350LF2 CANTIDAD Ovantité Ovantité PARTIDA Item Poste 39 7580201 45 7581005 46 7581006 48 7583949 48 7583949 52 7582780 52 7582780

Las dimensiones y la condición superficial se hallaron satisfactorias. Dimension and surface condition were found acceptable Les dimensions et étals de surface sont satisfaisants

CEG %

8%

1 %

A1 %

Co %

NP %

Cr % NI % I MD %

2 %

P %

Mn %

815

28

COLADA Nº Heal No N.ºCoulée

0,014

060'0

0,005 0,012

1,115

0,230 0,200 0,193 0,220 0,222

0,190 0,184 0,190 0,195 0,195 0,195

25AV8 69AV8 73AV8 97AV8 A45A6 B21A8

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

0,0003 0,40 0,0001 0,40 0,0003 0,40 0,0005 0,40 0,0004 0,39 0,0002 0,40

0,180 0,025 0,002 0,188 0,033 0,001 0,112 0,037 0,002 0,121 0,027 0,002 0,018 0,018 0,019 0,019 0,150 0,041 0,001 0,150 0,001 0,150 0,001 0,001 0,150 0,001

0,004 0,001 0,001 0,005 0,000 0,000

0,007 0,001 0,003 0,003 0,004

0,017

0,103

0,147

0,007 0,068 0,003 0,065 0,003 0,062 0,007 0,045 0,008 0,053 0,004 0,110

0,001

1,073 1,110 0,994 1,060 1,030

0,190

515 511 502

73AVB

22Y827 23Y809

04J802

WN 8 300LB STD/40 RF A350LF2

BLIND 8 600LB RF A350LF2 BLIND 8 600LB RF A350LF2 Los materiales citados cumplen las normas aplicables

Manufacturing requirements are salisfied. Les normes applicables sont respectées

CHAMA A Day of Gardning de Los 18d Warks Inspector - L'Inspecteur RAS COOF EL INSPECTOR DE VICTOR

Challty Assurance Deriv

(1) OBSERVACIONES. Observations Remarks

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



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

Date: 8/8/2019

Mill Test Reports

Invoice: 1599344-00

Customer: 27403-261

PO: 2610155

A.B.F. MINES/2985080

1310 AVE DAVY

ROUYN-NORANDA, QC J9Y 0A8

	Heat#	Product	Description
1	b03238	7586832	6 150 RF WN FLG STD A350LF2
2	a07a9	7586824	4 150 RF WN FLG STD A350LF2
3	b01568b	7586509	6 150 RF SO FLG A350LF2
4	b05432b	7586508	4 150 RF SO FLG A350LF2

(EN 10204 3.1) CERTIFICATE OF INSPECTION & TEST



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

/EC by LROA

Certificate No.	M1H0103-10/16	Date: AUG 27 2018	E-mail :qm@stnhcorp.com
Customer	CCTF CORPORATION		Certified to ISO90017 ISO14001:2015 PED20147687F
Contract No.	4038603-00		
Spec, For Materia	1 ASTM A105N-14, ASME SA105N-17	ASTM/ASME A/SA350 LFZ CL1-17, NAC	1-17. ASTM/ASME A/SA350 LF2 CL1-17, NACE MR0175/ISO 15156-2:2015, NACE MR0103/ISO 17495-1:2016
Heat Treatment	930°C NORMALIZED & A.C	۵	Dimensional inspection ASIME B16.5 - 2017

				Size of Test	Test		Tensi	Tension Test		I	Hardness	0	harpy In	Charpy Impact Test	t
			Hanna Min I	Specimen	nen		Y.S. T	T.S. E	ELR	R.A	Test	(10X	10mm S	10X10mm Specimen Size)	Size)
	ITEM / SIZE	Q'ty	Ratch No.	۵						%	(HB)	Indiv.	Ave.	Natch	Temp.
				mm	mm	Max	9	55		+	187	16)	201	>	-46°C
	The second secon	Ö		12.5	50.0	Min 2	250 4	485 27	22.0 30	30.0		Test	st Result	(1)	Ave.(J)
7586502	150LBS TH RF 6"	2	803238	12.5	50.0		375 5	545 3	35 67	70	151 153	118	145	89	110
7586824	150LBS WN RF STD 4"	20	803238	12.5	50.0	T.F.E.	375 5	545 3	5 6	67.5 1	51 153	118	145	68	110
7586832	150LBS WN RF STD 6"	50	803238	12.5	50.0	133.		545 3	5 6	57.5 1	1 153	118	145	68	110
7585267	150LBS WN RF XH 4"	10	803238	12.5	50.0	. era		545 3	5 67	1 5	11 153	118	145	68	110
7580014	300LBS SO RF 4"	20	B03238	12.5	50.0	1001	375 5	545 3	5 67	977	51 153	118	145	68	110
7587735	300LBS 50 RF 6"	2	803238	12.5	50.0	111			35 67	1	51 153	118	145	68	110
7585259	600LBS WN RF STD 3"	10	B03238	12.5	50.0	141		545 3	5 67	1 5	1 153	118	145	68	110 -
7581040	600LBS WIN RF XH 3"	25	803238	12.5	50,0			545 3	5 5	1 5	1 153	118	145	68	110
7581007	150LBS BL RF 18"	2	803776	12.5	50.0	-17.5		540 3	8 74	74.5 1	2 154	135	80	118	111
7580205	150LBS SO RF 20"	2	803776	12.5	50.0	(11	375 5	540 3	8 74	1 5	2 154	135	80	118	111

								Ü	lemical (Compos	ition (%				NDE	
Heat No./		0	157	Mr	5.	in	N	ڻ	Ma	5	>	Nb	3			-
Batch No.	Max	0.300	0.300	1.350	0.035	0.040	0.400	0.30	0.120	0.400	00 0.120 0.400 0.080	0.020		TO	TM	T4
	I	0,176	0.201	1.060	0.015	0,004	0.032	7.40.0	0.004	0.050	0.001	0.001	0.374			
B03238	Д	0.178	0.216	1.060	0.016	0.002	0.036		0.007	0.050	0.002	0.001	0.376			
	I	0.172	0.220	1.290	0.013	0.007	0.012		0.006	0.008	0.004	0.019	0.399			
803776	Д	0.174	0.220	1.290	0.011	0.003	0.012		0.006	0.008	0.001	0.015	0.400			
										BLANK	V					

REMARK " H . Heat Analysis P . Product Analysis

Witnessed by / H. J. LEE



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

HEAT; a07a9 CCTF Sku; 7586824 4 150 RF WN FLG STD A350LF2 Invoice: 1599344-00 PO; 2610155 8/8/2019 11:04:35 AM

CCTF CORPORATION (ONTARIO) 4151 NORTH SERVICE RD. UNIT 2 BURLINGTON, ONTARIO L7L4X6 - CANADA CAN

CERTIFICADO DE INSPECCION UNE EN 10204/06/13.1

Inspection Certificate - Certificat de Réception ISO 10474:1573.1

Z o 21/05/2019

203034

HOJA: Page:

SGI 6009987 ULMA FORJA, S.COOP. Management Systems certifled by LRGAE

FECHA: Date:

COMPOSICION QUIMICA - STEEL MAKER'S LADLE ANALYSE CHIMIQUE Las dimensiones y la condición superficial se hallaron satisfactorias.
- Dimposion and suitage condition were found acceptable

Les dimensions et étals de surface sont satisfaisants

Origin of Steel

CEq %

TI %

Cu % Al %

1 %

NI% Mo% Nb%

800

8 8

Mn % P %

% IS

2%

Ladle: L Product: P

Germany Germany

0,40

0,0002

0,053 0,034 0,001 0,061 0,028 0,001 0,094 0,028 0,002

0,002

0,000

0,017

0,050

0,008 0,004 0,037 0,010 0,005 0,050 0,011 0,005 0,049

1,138

0,206

0,192

A07A9 L C B888A8 L C A63A9 L C

Los materiales clados cumplen las normas aplicable.
 Manufacturing requirements are satisfied.
 Les normes applicables sont respectées.

EL INSPECTOR

Dpto. del Garantia de calinad Quality Assurance Dept. ULMAROBIAS COOP

(1) OBSERVACIONES.
Remarks
Observations

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

OFFICE - 74, Jwadongsunhwan-ro, Haeundae-gu, Busan, Korea ST&H CORPORATION

Charpy Impact Test

Hardness

Tension Test

Size of Test

Certified to ISO9001/ ISO14001;2015,PED2014/68/EC by LRQA PLANT - 11, Eogokgongdan 2-gil, Yangsan-si, Kyungnam, Korea Spec. For Material ASTM A105N-18, ASME SA105N-17, ASTM A350 LF2 CL1-18, ASME SA350 LF2 CL1-17, NACE MR0175/ISO15156-2: 2015, NACE MR0103/ISO17945: 2015 Tel: +82.51.744-4680(5 line) Fax +82.51.744-4670 Dimensional inspectionASME 816.5 - 2017 E-mail :qm@stnhcorp.com Date; JUN. 17, 2019 930°C NORMALIZED & A.C. CCTF CORPORATION MJH0427-06/08 4039342-00 Heat Treatment Certificate No. Contract No. Customer

						-	- Company	-	+	H	ŀ	T	Tank	740	V1 Bern	-	Circl
					*******		specimen	>	Y.S	T.S E.L	L R.A	-	lest	(10)	A TOTAL S	lov romin specimen size!	(ayıc
	ITEM / SIZE			Q'ty			GL	Σ	-	-			(HB)	Indiv.	Ave.	Notch	Тетр.
					batch No.	mm .	mm	Max		559		-	187	161	207	>	-46°C
						12.5	50.0	Min 2	250 4	485 22.0	.0 30.0	0	137	Te	Test Result	(1)	Ave.(J)
7580219	150LBS SO RF 10"			15	B01568B	12.5	50.0	3	356 5	515 39	9 76		147 154	83	78	81	80
7580220	150LBS SO RF 12"			25	B01568B	12.5	50.0	20	356 5	515 3	9 76	12		83	78	81	80
7586509	150LBS SO RF 6"			70	8015688	12.5	50.0	3	356 5	515 3	9 76	147		83	78	8.	80
7580218	150LBS SO RF 8"			12	8015688	12.5	50.0	3	356 5	15 3	92 6	-	47 154	83	78	81	80
7580200	150LBS WN RF STD 1"			15	8015688	12.5	20.0	60		515 3	97 6				78	81	80
7586832	150LBS WN RF STD 6"			45	B01568B	12.5	20.0	m	356 5	515 3	92 6	T	47 154		78	81	80
7583949	300LBS WN RF STD 8"			40	B01568B	12.5	50.0	m	356 5	15 3	9 16	1/2	47 154	83	78	81	80 .
7580203	150LBS SO RF 16"			4	B01979E	12.5	20.0	m	344 5	541 3	5 75.5		50 152		65	65	61
7580204	150LBS SO RF 18"			5	B01979E	12.5	50.0	m	344 5	41 3	5 75.5				65	59	19
7580205	150LBS SO RF 20"			2	B01979E	12.5	50.0	m	37.0	541 3	5 75.5	-	50 152	09	59	65	19
					Chemical	Composition (%)	ion (%)									NDE	
Host No /	C Si Ma	0.	50	ž	Cr Mo	- To	>	Nb				-		33			

							Š	hemical C	ompos	Composition (%)	(NDE	
	U	13	Min	D.	50	ž	Cc	Ma	Cu	>	Nb	CE			
Max	0.300	0.300	1.350	0.035	0.040	0.400	0.300	0.120	0.400	0.120 0.400 0.080	0.020		To .	MT	М
I	0.172	0.243	1290	0.011	0.004	9700	1000 1000 0000 2000 0000 0000	0.017	0.00	0.001	0.001	0.412			

I	0.172		1.290	0.011	0,004	0,026	0.094	0.017	-	0.001	0.001
D.	0,177	0.250	1,300	0.012	0.005	0.029	0.101	0.015	0.020	0.002	0.001
Ξ	0,177		1.270	60000	0.003	0.010	0.061	0.004	1	0.001	0.012
a	0.180		1.280	6000	0.002	0.012	0.038	9000	3016	0.001	0.015
										×	

* C:Mn = 145

* H. Heat Analysis P. Product Analysis

REMARK

B01568B

801979E



0.420 0.403 0.403 Manager of Q.A Dept. / JAY KIM

Witnessed by / H. J. LEE

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

Date: JUN. 17, 2019

CCTF CORPORATION

MJH0427-07/08

Certificate No.

Customer

OFFICE - 74, Jwadongsunhwan-ro, Haeundae-gu, Busan, Korea ST&H CORPORATION



PLANT - 11, Eogokgongdan 2-gil, Yangsan-si, Kyungnam, Korea Tel: +82.51.744-4680(5 line) Fax: +82.51.744-4670 E-mail:qm@stnhcorp.com

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

Spec. For Material ASTM A105N-18,ASME SA105N-17,ASTM A350 LF2 CL1-18,ASME SA350 LF2 CL1-17,NACE MR0175/ISO15156-2:2015,NACE MR0103/ISO17945:2015 Dimensional inspection ASME 816.5 - 2017 930°C NORMALIZED & A.C. 4039342-00 Heat Treatment Contract No.

									Size	Size of Test		Tens	Tension Test	1	I	Hardness		Charp	Charpy Impact Test	Test	
								Hann Mary	Spe	Specimen		YS	T.S. E	E.L. R.	R.A	Test	5	10X10m	(10X10mm Specimen Size)	nen Size	6
	ITE	ITEM / SIZE	щ				Q'ty	Date No.	٥	J.		MPa	-	6 %	%	(HB)	Indiv.	v. Ave.	e. Notch		Temp.
							0	DALCH NO.	mm	шш	Max		655			187	16J	7 201	N N		-46°C
									12.5	50.0	Min	250	485 2	22.0 30	30.0	137		Test Re	Result (J)	AV	Ave.(J)
7589925	300LBS 50 RF 12"	RF 12"					2	B01979E	12.5	50.0		344	541 3	35 75	75.5 15	50 152	09		65 59		19
7580216	150LBS SO RF 1"	RF 1"					15	8054328	12.5	50.0		357	515 4	11 7	76 15	50 154	1 89	80	96 96	01	91
7586504	150LBS SO RF	RF 2"					25	B05432B	12,5	50.0		357	515 4	1 7	051 9	0 154	1 89		66 9	01	91
7586507	150LBS SO RF 3"	RF 3"					20	B05432B	12.5	50.0		357	515 4	11 7	9 15	50 154	1 89		96 96	6	31
7586508	150LBS SO RF 4"	RF 4"					80	B05432B	12.5	50.0		357	515 4	11 7	9 15	50 154	1 89			01	91
7587602	150LBS SW RF XH 1"	RF XH	1.6				25	B05432B	12.5	50.0		357	515 4	11 7	9 15	50 15			66 98	6	16
7587603	150LBS SW RF XH 1 1/2"	RF XH	1 1/2"				25	8054328	12.5	50.0		357	515 4	11 7	6 15	50 154	1 89	80		01	16
7587600	150LBS SW RF XH 1/2"	RF XH	1/2"				250	8054328	12,5	50.0		357	515	11 7	9 15	50 154	1 89		66 98	5	31
7587604	150LBS SW RF XH 2"	RF XH	2"				20	B05432B	12.5	50.0		357	515	11 7	9 15	50 154	1 89	60	9 9	01	91
7587601	150LBS SW RF XH 3/4"	RF XH	3/4"				25	8054328	12.5	50.0		357	515 4	11 7	9 15	50 154	1 89	00	96 9	5	16
								Chemical Composition (%)	omposit	ion (%)		П						-	-	NDE	
Heat No./	a	Si	Mn	0.	ın	148	Ü	Mo	Cu	>	Mb							CE			

* C:Wn = 155 P : Product Analysis * H : Heat Analysis REMARK

Witnessed by / H. J. LEE

MANAC

PT

MT

5

0.020

0.080

0.120 0.400

0.040 0.400 0.300

0.035

1.350 Min

> 0.300 0.150

0.300

Max

Min

Heat No./ Batch No.

0.015 0.012

> 0.001 0.001 0.001

> 90000 0.003 0.004

0.012 0.010

0.002 0.003 0.003

6000 0.014

0.229

0.180

801979E

0.010 0.038

0.011

0.014

0.249

0.178

B05432B

0.251

0.175

ILIC

0.001

0.009 0.012 0.016 0.015

0.004

0.061

0.010

0.003

0.009

1.270 1,280 1.250

0.212

0.177

0.001 0.001

BLANK

0.403 0.403 0.387 0.391 Manager of Q.A Dept. / JAY KIM

ST&H CORPORATION

57-801-14-02

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

CERTIFIED MILL TEST REPORT

The Best Value -Price, Quality, Service All The Time.

LOG NO. F00000000100245

Page I of 2

BONNEY FORGE CORPORATION

P.O. BOX 330 • 14496 CROGHAN PIKE • MOUNT UNION, PA 17066-0330

(814) 542-2545 • (800) 345-7546 • FAX (814) 542-4906

www.bonneyforge.com

CUSTOMER: CCTF CORPORATION

DATE 10/04/2017

CUSTOMER

BONNEY ORDER NO. B000229128

ORDER NO.: 4037926-00

SHIP TO: CCTF CORPORATION (BURLINGTON)

4151 NORTH SERVICE ROAD

UNIT 2

BURLINGTON ON L7L 4X6

Canada

₹ ITEM	QUANTITY	LOT NO.	GRADE OR SPECIFICATION NO CHEMICAL ANALYSIS, PHYSICAL PROPERTIES, REMARKS:
3	50	50196	36-3X1 3M LF2 FLEX T SA/A350 LF2 CL1
7690075			Al 0.032 C 0.200 Co 0.002 Cr 0.040 Cu 0.030 Mn 1.050 Mo 0.003 Nb 0.014 Ni 0.020 P 0.005 S 0.019 Si 0.270 V 0.003 CE(Long Formula) = 0.39
			T/S(PSI) 71,610 Y/S(PSI) 47,449 EL(%) 36.85 RA(%) 57.04 Brinell 135 BHN 135 BHN
			Charpy -50 F 77/66/56 (Ft-Lbs) Average 66.30
5	50	50076	36-11/2X3/4 3M LF2 FLEX S SA/A350 LF2 CL1
7690149			Al 0.027 C 0.200 Co 0.004 Cr 0.050 Cu 0.100 Mn 0.970 Mo 0.016 Nb 0.013 Ni 0.060 P 0.011 S 0.019 Si 0.220 V 0.003 CE(Long Formula) = 0.39
			T/S(PSI) 76,500 Y/S(PSI) 53,000 EL(%) 31.00 RA(%) 64.00 Brinell 159 BHN 146 BHN
			Charpy -50 F 42/58/45 (Ft-Lbs) Average 48.30
6	50	50196	36-3X I 3M LF2 FLEX S SA/A350 LF2 CL1
7690199			Al 0.032 C 0.200 Co 0.002 Cr 0.040 Cu 0.030 Mn 1.050 Mo 0.003 Nb 0.014 Ni 0.020 P 0.005 S 0.019 Si 0.270 V 0.003 CE(Long Formula) = 0.39
			T/S(PSI) 71,610 Y/S(PSI) 47,449 EL(%) 36.85 RA(%) 57.04
			Brinell 135 BHN 135 BHN Charpy -50 F 77/66/56 (Ft-Lbs)
			Average 66.30

We certify that the data on this sheet is a true copy taken from our records of material furnished us by the production mill, or as obtained by additional laboratory checks.

CMTR: REV2

Puing

Kylee Ruiz

QUALITY PROCESS MANAGER

CERTIFIED MILL TEST REPORT

The Best Value -Price, Quality, Service LOG NO. F00000000100245

Page 2 of 2

BONNEY FORGE CORPORATION

P.O. BOX 330 • 14496 CROGHAN PIKE • MOUNT UNION, PA 17066-0330

(814) 542-2545 • (800) 345-7546 • FAX (814) 542-4906

www.bonneyforge.com

CUSTOMER: CCTF CORPORATION

DATE 10/04/2017

CUSTOMER

BONNEY ORDER NO. B000229128

ORDER NO.: 4037926-00

SHIP TO: CCTF CORPORATION (BURLINGTON)

4151 NORTH SERVICE ROAD

UNIT 2

BURLINGTON ON L7L 4X6

Canada

ITEM QUANTITY

LOT NO.

GRADE OR SPECIFICATION NO

- I. THE FITTINGS SUPPLIED ARE IN ACCORDANCE WITH PURCHASE ORDER SPECIFICATIONS.
- CERTIFYING TO ASTM A350 LF2 07 REVISION.
- 3. THE MATERIAL OF THE FITTINGS SUPPLIED IS ASTM A350-LF2 BUT MEETS THE REQUIREMENTS OF ASME SA350-LF2.
- 4. THE CHARPY V-NOTCH IMPACT TEST WAS PERFORMED AT -50 DEGREES FAHRENHEIT IN ACCORDANCE WITH A350-LF2.
- 5. THE MATERIAL SUPPLIED AS A350 LF2 CLI MEETS THE REQUIREMENTS OF BOTH NACE MRO103-2007 AND NACE MRO175/ISO 15156-2.
- 6. THE MATERIAL SUPPLIED WAS NORMALIZED IN ACCORDANCE WITH ASTM A350 HEAT TREATING REQUIREMENTS.
- 7. THE PRODUCT SUPPLIED WAS INSPECTED IN ACCORDANCE WITH EN 10204:2004 EDITION TYPE 3.1 INSPECTION DOCUMENT. (EUROPEAN STANDARD)
- 8. THE UNIT OF MEASURE FOR TENSILE AND YIELD (0.2%) STRENGTH ARE REPORTED IN PSI.
- 9. ELONGATION TEST RESULTS ARE OBTAINED USING STANDARD ROUND SPECIMEN. 2 INCH OR 50 MM GAGE LENGTH.

We certify that the data on this sheet is a true copy taken from our records of material furnished us by the production mill, or as obtained by additional laboratory checks.

Kylee Ruiz

QUALITY PROCESS MANAGER

Ruin

CMTR: REV2



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

Date: 8/13/2019

Mill Test Reports

Invoice: 1599535-00

PO: 2610160-00

Customer: 27403-261

A.B.F. MINES

1310 AVE DAVY

ROUYN-NORANDA, QC J9Y 0A8

	Heat#	Product	Description
1	b01568b	7583949	8 300 RF WN FLG STD A350LF2
2	b03238	7586832	6 150 RF WN FLG STD A350LF2
3	50313 **	7690199	1 X 3-36 3000 SOL A350LF2

CCTF CORPORATION MJH0427-06/08 Certificate No. Customer

4039342-00

Contract No.

930°C NORMALIZED & A.C.

Heat Treatment

Date: JUN. 17, 2019

Spec. For Material ASTM A105N-18, ASME SA105N-17, ASTM A350 LF2 CL1-18, ASME SA350 LF2 CL1-17, NACE MR0175/ISO15156-2:2015, NACE MR0103/ISO17945:2015

Dimensional InspectionASME B16.5 - 2017

OFFICE - 74, Jwadongsunhwan-ro, Haeundae-gu, Busan, Korea Tel: +82,51,744-4680(5 line) Fax: +82,51,744-4670



PLANT - 11, Eogokgongdan 2-gil, Yangsan-si, Kyungnam, Korea E-mail:qm@stnhcorp.com

ST&H CORPORATION

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

				Size o	f Test		Tensi	insion Test		Ha	rdness	0	harpy In	Charpy Impact Test	3
			The same of	Spec	imen		Y.S.	L'S E	L R.A		Fest	(10)	10mm S	pecimen	Size)
	ITEM / SIZE	0.17	Heat No./	D	D GL	-		MPa %			(HB)	Indiv.	Ave.	Notch	Temp.
			DAICH NO.	mm	mm	Max			-		187	16)	207	>	-46°C
				12.5	50.0	Min		485 22	22.0 30.0		137	Te	st Result	(1)	Ave.(J)
7580219	150LBS SO RF 10"	15	B01568B	12.5	50.0				9 76	147		83	78	81	80
7580220	150LBS SO RF 12"	25	8015688	12.5	50.0			515 3	9/ 6	14	154	83	78	18	80
7586509	150LBS SO RF 6"	70	8015688	12.5	50,0				39 76			83	78	81	80
7580218	150LBS SO RF 8"	12	8015688	12.5	50.0				92 6			83	78	81	80

		М
NDE		MT
		5
	35	
9	NP	0.020
sition (%)	>	0.080
Compos	ð	0.400
hemical	Mo	0.120 0.4
2	5	0.300
	Z	0.400
	v	0.040
	۵	0.035
	Min	1.350
	15	0.300
	J	0.300
		Max
	Heat No./	Batch No.

80 80 61 61 61

539 539

59

83 09 09

152

150

75.5 75.5

344

450

75.5

59

78 78

83

54 154

> 147 147

94 16

39 39 35 35

356 356

> 12.5 12.5 12.5 12.5

356

50.0

50.0 50.0

515 515 515 541 541

50.0 50.0

B01568B B01568B 8015688 B01979E B01979E 801979E

150LBS WN RF STD 1" 150LBS WN RF STD 6" 300LBS WN RF STD 8"

7580200 7586832 150LBS SO RF 16" 150LBS SO RF 18" 150LBS SO RF 20"

7583949

7580203 7580204 7580205

15 40

Heat No./		,	75	Min		v	ž			_		NP	
Batch No.	Max	0.300	0.300	1.350	300	0.040	0.400	0.300	0.120	0.400	The last	0.020	
	I	0.172	0.243	1.290	0.011	0.004	0.026	0.094	710.0	0.020	0.001	0,001	
31568B	۵	0.177	0,250	1,300	1	0.005	0.029	0.101	0.015	0.020	0.002	0,007	
	I	0.177	0.212	1.270	100	0.003	0.010	0.061	0.004	6000	0.001	0.012	
31979E	d.	0.180	0.229	1,280		0.002	0.012	0.038	900'0	0.012	0.001	0.015	
										RIANI			

* C:Mn = 155

* H : Heat Analysis P : Product Analysis

REMARK

0.412 0.420 0.403 0.403

Witnessed by / H. J. LEE

Manager of Q.A Dept. / JAY KIM

MANAG

CORPORA

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

ST&H CORPORATION





(EN 10204 3.1) CERTIFICATE OF INSPECTION & TEST

MJH0103-10/16 Certificate No.

CCTF CORPORATION Customer

Spec. For Material ASTM A105N-14, ASME SA105N-17, ASTM/ASME A/SA350 LF2 CL1-17, NACE MR0175/ISO 15156-2:2015, NACE MR0103/ISO 17495-1:2016 4038603-00 Contract No.

930°C NORMALIZED & A.C.

Heat Treatment

Date: AUG. 27, 2018

ST&H CORPORATION

PLANT – 11, Eogokgongdan 2-gil, Yangsan-si, Kyungnam, Korea Tel : #82,51.744-4680(5 line) Fax : +82,51.744-4670 OFFICE - 74, Jwadongsunhwan-ro, Haeundae-gu, Busan, Korea E-mail :qm@stnhcorp,com

10/00E0X0 Sdd

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

Dimensional inspection ASME B16.5 - 2017

		_		Size o	size of lest		Lensi	Tension lest		-	Hardness	2	Ę	charpy impact less	Dace 12	10
				Spec	Specimen		γ.5	TS EL	L RA	A	Test	-	(10X1	0mm S	10X10mm Specimen Size)	Size)
	ITEM / SIZE	Q'ty	meat No./	۵	GL	2	-	MPa %			(HB)	in in	ndiv.	Ave.	Notch	Temp.
			paten No.	mm	mm	Max	-	655	-		187		16,1	203	>	⊃.9b-
				12.5	50.0	Min 2	250 4	485 22	22.0 30.0	0.			Test	Result	(1)	Ave.(J)
7586502	150LBS TH RF 6"	2	803238	12.5	50.0	10	375 5	545 35	5 67.5	-	51 15	153 1	18	145	68	110
7586824	150LBS WN RF STD 4"	50	B03238	12.5	50.0	117)	375 5	545 3	5 67.5	5 1	115	53 1	18	145	68	110
7586832	150LBS WN RF STD 6"	20	803238	12.5	50.0	in		545 35	5 67.5	-	51 15	53 1	18	145	68	110
7585267	150LBS WN RF XH 4"	10	B03238	12.5	50.0	tri	375 5	345 3	5 67.5	5 1	11	53 1	100	145	89	110
7580014	300LBS 5O RF 4"	5	803238	12.5	50.0	m		35 35		5 1	11 15	53 1	18	145	89	110
7587735	300LBS SO RF 6"	2	B03238	12.5	50.0	in		35 35	5 67.5	5	11	53 1	18	145	68	110
7585259	600LBS WN RF STD 3"	10	803238	12.5	50.0	m		345 3	5 67.5	5	11 15	53 1	118	145	68	110
7581040	600LBS WN RF XH 3"	25	803238	12.5	50.0	an		545 3	5 67.5	5 1	11 15	53 1	18	145	68	110
7581007	150LBS BL RF 18"	2	803776	12.5	50.0	171	75	340 3	8 74	74.5 15	32 15	14 1	135	80	118	111
7580205	150LBS SO RF 20"	2	803776	12.5	50.0	an	75	540 3	8 74	74.5 19	52 15	54 1	35	80	118	111

1		H	
NDE		TM	
		5	
	33		0.374
	Nb	0.020	0.001
tion (%)	^	0.080	0,001 0
nical Composition (%)	S		0.050
emical C	Mo	0.300 0.120 0.400	0.004
Ch	ŭ	0.300	0.077
	2	0.400	0.032
	N)	0.040	.176 0.201 1.060 0.015 0.004 0
	а	0.300 0.300 1.350 0.035 0.040 0.150 0.600	0.015
	Mn	1.350	1.060
	15	0.300	0.201
	0	0.300	0.176
		Max	I
	Heat No./	Batch No.	

0.176	0.201	1.060	0.015		0.032	0.077	0,004		0.001	0.001
0.178	0.216	1.060	0.016	0.002	0.036	0.073	0.007	0.050	0.002	0.001
0.172	0.220	1.290	0.013		0.012	0.045	900.0		0,004	0.019
0.174	0.220	1.290	0.011		0.012	0.044	900.0		0.001	0.015

BLANK

* H : Heat Analysis P : Product Analysis **REMARK**

Witnessed by / H. J. LEE



0.399

0.376

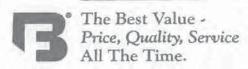
Manager of Q.A Dept. / JAY KIM

ST&H CORPORATION

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

ST-801-14-02

CERTIFIED MILL TEST REPORT



LOG NO. F00000000110349

Page 1 of 2

BONNEY FORGE CORPORATION

P.O. BOX 330 • 14496 CROGHAN PIKE • MOUNT UNION, PA 17066-0330

(814) 542-2545 * (800) 345-7546 * FAX (814) 542-4906

www.bonneyforge.com

CUSTOMER: CCTF CORPORATION

DATE 07/13/2018

CUSTOMER

ORDER NO.: 4038733-00

SHIP TO: CCTF CORPORATION (BURLINGTON)

4151 NORTH SERVICE ROAD

UNIT 2

BURLINGTON ON L7L 4X6

Canada

BONNEY ORDER NO. B000243044

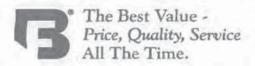
ITEM	QUANTITY	LOT NO.	GRADE OR SPECIFICATION NO. CHEMICAL ANALYSIS, PHYSICAL PROPERTIES, REMARKS:
3 7690072	50	50200	36-3/4 X 1/2 3M LF2 FLEX T SA/A350 LF2 CL1 AI 0.024 C 0.200 Co 0.002 Cr 0.030 Cu 0.050 Mn 1.040 Mo 0.005 Nb 0.012 Ni 0.020 P 0.006 S 0.022 Si 0.230 V 0.003 CE(Long Formula) = 0.39 T/S(PSI) 71,500 Y/S(PSI) 48,100 EL(%) 35.00 RA(%) 69.00 Brinell Hardness 137 BHN 135 BHN Charpy -50 F 78/55/52 (Ft-Lbs) Average 61.70
4 7690199	50	50313	36-3X1 3M LF2 FLEX S SA/A350 LF2 CL1 A1 0.036 C 0.200 Co 0.002 Cr 0.060 Cu 0.080 Mn 1.000 Mo 0.006 Nb 0.014 Ni 0.030 P 0.006 S 0.023 Si 0.240 V 0.003 CE(Long Formula) = 0.39 T/S(PSI) 73,427 Y/S(PSI) 48,233 EL(%) 35.25 RA(%) 61,22 Brinell Hardness 135 BHN 135 BHN Charpy -50 F 27/28/33 (Ft-Lbs) Average 29.30
5 7690149	100	50295	36-11/2X3/4 3M LF2 FLEX S SA/A350 LF2 CL1 Al 0.021 C 0.200 Co 0.002 Cr 0.030 Cu 0.080 Mn 1.020 Mo 0.007 Nb 0.011 Ni 0.030 P 0.005 S 0.023 Si 0.260 V 0.003 CE(Long Formula) = 0.39 T/S(PSI) 73,778 Y/S(PSI) 50,401 EL(%) 36.55 RA(%) 65.23 Brinell Hardness 135 BHN 135 BHN Charpy -50 F 43/68/39 (Ft-Lbs) Average 50.00

We certify that the data on this sheet is a true copy taken from our records of material furnished us by the production mill, or as obtained by additional laboratory checks.

Puin

Kylee Ruiz

QUALITY PROCESS MANAGER



LOG NO. F00000000110349

Page 2 of 2

BONNEY FORGE CORPORATION

P.O. BOX 330 • 14496 CROGHAN PIKE • MOUNT UNION, PA 17066-0330 (814) 542-2545 • (800) 345-7546 • FAX (814) 542-4906

www.bonneyforge.com

CUSTOMER: CCTF CORPORATION

DATE 07/13/2018

CUSTOMER

BONNEY ORDER NO. B000243044

ORDER NO.: 4038733-00

4050755-00

SHIP TO: CCTF CORPORATION (BURLINGTON)

4151 NORTH SERVICE ROAD

UNIT 2

BURLINGTON ON L7L 4X6

Canada

ITEM QUANTITY LOT NO.

GRADE OR SPECIFICATION NO. CHEMICAL ANALYSIS, PHYSICAL PROPERTIES, REMARKS:

- THE FITTINGS SUPPLIED ARE IN ACCORDANCE WITH PURCHASE ORDER SPECIFICATIONS.
- 2. CERTIFYING TO ASTM A350 LF2 17 REVISION.
- THE MATERIAL OF THE FITTINGS SUPPLIED IS ASTM A350-LF2.
 BUT MEETS THE REQUIREMENTS OF ASME SA350-LF2.
- THE CHARPY V-NOTCH IMPACT TEST WAS PERFORMED AT -50 DEGREES FAHRENHEIT IN ACCORDANCE WITH A350-LF2.
- THE MATERIAL SUPPLIED AS A350 LF2 CLI MEETS THE REQUIREMENTS OF BOTH NACE MRO103/ISO 17945 2015
 NACE MRO175/ISO 15156-2 2015 EDITION.
- THE MATERIAL SUPPLIED WAS NORMALIZED IN ACCORDANCE WITH ASTM A350 HEAT TREATING REQUIREMENTS.
- 7. THE PRODUCT SUPPLIED WAS INSPECTED IN ACCORDANCE WITH EN 10204:2004 EDITION TYPE 3.1 INSPECTION DOCUMENT. (EUROPEAN STANDARD)
- 8. THE UNIT OF MEASURE FOR TENSILE AND YIELD (0.2%) STRENGTH ARE REPORTED IN PSI.
- ELONGATION TEST RESULTS ARE OBTAINED USING STANDARD ROUND SPECIMEN,
 INCH OR 50 MM GAGE LENGTH.

We certify that the data on this sheet is a true copy taken from our records of material furnished us by the production mill, or as obtained by additional laboratory checks.

by

Ruing

Kylee Ruiz

QUALITY PROCESS MANAGER



BOTH-WELL STEEL FITTINGS CO., LTD.

NO.303, REN-SIN ROAD, REN-WU DISTRICT, KAOHSIUNG CITY, TAIWAN, R.O.C.(81460) TEL: (886)7-3711536, 3710497, 3720260 FAX: (886)7-371-3864, 3713882 WEB SITE: http://www.bothwell.com.tw E-Mail: box@bothwell.com.tw

An ISO 9001 : 2015 Registered Manufacturer

M LL TEST & INSPECTI ON CERTIFICATE

ACCORDING TO EN 10204 3, 1

CLSTOMER: SEYBOLD I NTERNATI ONAL CORP.

I NVOI CE NO : 5200011852

CERT NO. : 180410 ORDER NO : 7013926

DATE : 02/12/2018

LC NO :

ORI CIN: TAI WAN

PACE: 19

RAW HEAT NO. I TEM HEAT NO

QIY

DESC! GRADE OR SPECIFICATION NO. CHEM CAL COMPOSITION 90 MECHANICAL PROPERTIES.

108 355196

100 PCS UNION NUTCOCT) - BODY RODI LF2 CLI (No. 1-1/2" 3000# S/W SQK3UI. 5-BW

C 0. 18 Si : 0. 25 Ma: 1. 05 P: 0. 014 S: 0. 005 Cu: 0. 04 Cr: 0. 07 Ni: 0. 03 Ma: 0. 01 V: 0. 003 No: 0. 003 No: 0. 0099 Ti: 0. 002

CE: 0.38

TS(KSI): 73.8 YS 0.29(KSI): 55.5 EL(%): 32.5 R.A.(%): 69.1 HARDNESS 1(HBW: 141 HARDNESS 2(HBW: 143 IMPACT TEST - 46°C

(-50.8°F) 1:48 J 2:87 J 3:67 J AVC 67 J

REMARK :

THE MATERI AL SUPPLI ED I DENTI FI ED AS ASTM A350 - 15, ASME SA350 - 2015ED, LF2 CL I

THE FITTING SUPPLIED I DENTIFIED AS MGS SP-83 - 2014

THE PRODUCT SUPPLIED WAS INSPECTED IN ACCORDANCE WITH SPECIFICATION, SURFACE & DIM. : COOD

STANDARD : CHEM CAL COMPOSITION 90 & MECHANICAL PROPERTIES.

	C	Si	Ma	P	S	Cu	Cr	Né	Mb	٧	Cb(Nb)
MN		0. 15	0.60	-	-	-			a T	-	-
MAX	0.30	0.30	1. 35	0.035	0.040	0.40	0.30	0.40	0.12	0.08	0. 02
	N	Al	Ti	Zr	CE	TS(KSI)	YS(KSI)	YS 0.2% (KSI)	EL(%)	R of A(%)	HARDNESS/ HBWJ
MN					-	70		36	22	30	*
MAX	-				0.47	95					197

HEAT TREATMENT: NORMALIZED 900°C(1652°F) A.C.

CONFORM TO NACE MR0175-15/1SO 15156-15/ MR0103-15

FULLY KILLED AND FINE GRAIN PRACTICE FREE FROM RADI ATT ON CONTAM NATI ON

REF#90817 ABW

WE CERTIFY THE ABOVE MENTI ONED FITTINGS HAVE BEEN MANUFACTURED. SAMPLED, TESTED, AND INSPECTED IN ACCORDANCE WITH THE SPECI FI CATI ONS SHOWN

Q C MANAGER





BW-D0839 REV:0

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

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

TEL: 886-7-371-0497, 371-1536, 372-0260

An ISO 9001:2000 Registered Manufacturer





FAX: 886-7-371-3864, 371-3882

web site:http://www.bothwell.com.tw e-mail:bothwell@www.bothwell.com.tw or box@mail.bothwell.com.tw

& INSPECTION CERTIFICATE TEST MILL

ACCORDING TO EN10204/DIN50049/3.1.B

CUSTOMER: WEIFANG STEEL CANADA LTD.

INVOICE NO: BW089706095

ORIGIN: TAIWAN

DATE: 12/10/08

ITEM	BOTH WELL HT.CD.	RAW MA			D	ESCR	IPTI	ON		QUANTIT	Y ASME SAL LF2-Clas	SPECIFICATION: ASTM A350 -04a ASME SA350 -E04 LF2-Class1 DIMENSION:			
014 023 029 035 036 070 070	Y050 Y050 Y050 Y050 Y050 Y047 Y047	X1651 X1651 X1651 X1651 X1651 X1653 X1653			.G 1-1/2 .G 1-1/2 /2" 3000 8000# NE	2" 3000# 2" 3000# 0# NPT PT 000# S/W				300 P 1000 P 300 P 400 P 600 P 110 P 50 P	C ASME BIOCC SURFACE BY VISUACE C	6.11-2005			
ITEM	BOTH				СНЕ	MICA	L CO	MPOS	ITIC	N (%)					
	WELL	C	Si	Mn	P	S	Cu	Cr	Ni	Мо	٧	Cb(Nb)	N		
Min Max	HT.CD	0.300	0.150 0.300	0.600	0.035	0.040	0.400	0.300	0.400	0.120	0.080	0.020	•		
014	Y050	0.200	0.190	1.040	0.007		10 S 0 4 5 12 2 2 2 5 5 5	0.060	0.030	0.010	0.001	0.000	14:		
023	Y050	0.200	0.190	1.040	0.007	120000000000000000000000000000000000000	The part of the second	0.060	0.030	0.010	0.001	0.000	•		
029	Y050	0.200	0.190	1.040	0.007			0.060	0.030	0.010	0.001	0.000	*		
035	Y050	0.200	0.190	1.040	0.007			0.060	0.030	0.010	0.001	0.000	*		
036	Y050	0.200	0.190	1.040	0.007		1157405-775	0.060	0.030	0.010	0.001	0.000	-		
070	Y047 Y047	0.200	0.220	1.050	0.012		A A CONTRACTOR OF CO.	0.190	0.040	0.020	0.010	0.000	-		
ITEM	The state of			I A N I		TES		Remark:	0.000	•					
	BOTH	Tensile	Yiel		on-	R of A	Hardness			ESS : ELEC					
	WELL Strength Stren (KSI) (KS		Streng (KSI	The second secon	tion		(AVG.)		ATED(°C) 1 ALUE(CHARI	NORMALIZED:900°C TEMPERED:620°C PY) -50°F(-46.0°C)					
	HT.CD			-	%)	(%)	(HB)	HEAT NO.	(G.(J)						
Min Max		70.0 95.0	36.0	71 0	2.0	30.0	197	X1653 Y		272 257 271.333 188 175 201.667					
014	Y050	79.7	60.	7 3	4.6	76.2	151	WE CERT	IFY THE	ABOVE MENTIONED FITTINGS HAVE BE					
023	Y050	79.7	60.	7 3	4.6	76.2	151	MANUFAC	CTURED A	ND TESTE		ORDANCE W			
029	Y050	79.7	60.	7 3	4.6	76.2	151	SPECIF	ICATIONS	SHOWN					
035	Y050	79.7	60.	7 3	4.6	76.2	151			1 1		01			
036	Y050	79.7	60.	7 3	4.6	76.2	151	11	1	160	6	CHL	T		
070	Y047	78.1	58.	1 3	6.2	80.3	144	U.C	. 100	206		***************************************	0		
070	Y047	78.1	58.	1 3	6.2	80.3	144	20.0237	N CHENG			INSPECTOR HUN CHIEH			



Phoenix * Capitol * Camco CapProducts

Certified Material Test Report

Commanding a Higher Standardsm

Printed: 8/20/2019

Customer

EMCO DISTRIBUTION GROUP

PO BOX 5300 STATION A

LONDON, ON N6A 4N7

Certified: 12/18/2018 P.O. 2610174-00

Tag 3050060

Heat No 174321 Heat Code 87AH

Phoenix Order # 1481945

Material ASTM A333 GR6 2015/ASME SA333 GR6 2015 Edition

Part Number

15111512CSA

Description

1-1/2X6 XHSML BK STL NIPL A333 GR6 CSA

Chemical Properties

C	Mn	P	S	Si	Cu	Ni	Cr
0.1300	1.3200	0.0090	0.0050	0.3100	0.0390	0.0200	0.0600
Mo	I v	Co	AI	Ch	N	Ph	Sn

Π	C Eq. Long	
	0.3687	Ī

Mo	V	Co	Al	Cb	N	Pb	Sn	Ta	Ti
0.0100	0.0040			0.0180					0.0020

Additional Chemical Properties

В		
0.00030		

Cr	+ Cu	+Ni
	0.119	90

Mechanical Properties

Tensile (PSI)	Yield (PSI)	Elong. % in 2 in. or 4D	RofA	HBW	HBW2
72,374	55,985	37.0%		150	0

Charpy Minimum Impact - ft/lbs

Test 1	Test 2	Test 3	Average	Test Temp.
48	41	49	46.00	-54

* Bend test passed.

We hereby certify that these parts were manufactured, sampled, tested, and inspected in accordance with the product specifications stated and were found to meet the requirements.

We further certify that this material was inspected using independentinspectors conforming to the requirements of EN 10204 3.1. These products meet the requirements of the latest editions of NACE MR0175, NACE MR0103, and ISO 15156. No weld repair has been performed on these products. This material was not exposed to mercury or any other metal alloy that is liquid at ambient temperatures during processing or while in our possession

Comments:

Flattening test passed. Ultrasonic test passed. Charpy V Impact Tested at -54 $^{\circ}$ C. Specimen size - 10 x 3.33 mm Hot finished, Normalized



CapProducts Certified Material Test Report

Phoenix * Capitol * Camco

Commanding a Higher Standardsm

Printed: 8/20/2019

Customer

EMCO DISTRIBUTION GROUP

PO BOX 5300 STATION A

LONDON, ON N6A 4N7

Certified: 06/07/2019

P.O. 2610174-00 Tag 3050060 Heat No 608622 Heat Code 87HU

Phoenix Order # 1481945

Material ASTM A333 GR6 2015/ASME SA333 GR6 2015 Edition

Part Number

15111512CSA

Description

1-1/2X6 XHSML BK STL NIPL A333 GR6 CSA

Chemical Properties

C	Mn	P	S	Si	Cu	Ni	Cr		C Eq. Lo
0.1300	0.7200	0.0140	0.0030	0.2000	0.0900	0.0700	0.0900		0.2833
Mo	V	Co	Al	Cb	N	Pb	Sn	Ta	Ti
0.0200	0.0030			0.0140		1/2			0.0020

Additional Chemical Properties

Boron		
0.00010		

Cr-	Cu + Ni
().2500

Mechanical Properties

Tensile (PSI)	Yield (PSI)	Elong. % in 2 in. or 4D	R of A	HBW	HBW2
64,107	44,672	34.0%		134	0

Charpy Minimum Impact - ft/lbs

Test 1	Test 2	Test 3	Average	Test Temp.
44	44	46	44.67	-55

^{*} Hydro test passed. at 3000 psi.

* Bend test passed.

We hereby certify that these parts were manufactured, sampled, tested, and inspected in accordance with the product specifications stated and were found to meet the requirements.

We further certify that this material was inspected using independentinspectors conforming to the requirements of EN 10204 3.1. These products meet the requirements of the latest editions of NACE MR0175, NACE MR0103, and ISO 15156. No weld repair has been performed on these products. This material was not exposed to mercury or any other netal alloy that is liquid at ambient temperatures during processing or while in our possession

Comments:

Flattening test passed.

Charpy V Impact Tested at -55° C. Specimen size - 10 x 4 mm.

Normalized

Phoenix * Capitol * Camco CapProducts

Certified Material Test Report

Commanding a Higher Standardsm

Printed: 8/20/2019

Customer

EMCO DISTRIBUTION GROUP PO BOX 5300 STATION A

LONDON, ON N6A 4N7

Certified: 06/07/2019 P.O. 2610174-00

Tag 3050060

Heat No 608622

Heat Code 87HU

Phoenix Order# 1481945

Material ASTM A333 GR6 2015/ASME SA333 GR6 2015 Edition

Part Number

15111512CSA

Description

1-1/2X6 XHSML BK STL NIPL A333 GR6 CSA

Chemical Properties

C	Mn	P	S	Si	Cu	Ni	Cr		C Eq. Long
0.1300	0.7200	0.0140	0.0030	0.2000	0.0900	0.0700	0.0900		0.2833
Mo	V	Co	Al	Cb	N	Pb	Sn	Ta	Ti
0.0200	0.0030			0.0140					0.0020

Additional Chemical Properties

Boron		Jan Control
0.00010		

	Cr + Cu + Ni	
ī	0.2500	

Mechanical Properties

Tensile (PSI)	Yield (PSI)	Elong. % in 2 in. or 4D	R of A	HBW	HBW2
64,107	44,672	34.0%		134	0

Charpy Minimum Impact - ft/lbs

Test 1	Test 2	Test 3	Average	Test Temp.
44	44	46	44.67	-55

^{*} Hydro test passed, at 3000 psi.

* Bend test passed.

We hereby certify that these parts were manufactured, sampled, tested, and inspected in accordance with the product specifications stated and were found to meet the requirements.

We further certify that this material was inspected using independentinspectors conforming to the requirements of EN 10204 3.1. These products meet the requirements of the latest editions of NACE MR0175, NACE MR0103, and ISO 15156. No weld repair has been performed on these products. This material was not exposed to mercury or any other netal alloy that is liquid at ambient temperatures during processing or while in our possession

Comments:

Flattening test passed.

Charpy V Impact Tested at -55° C. Specimen size - 10 x 4 mm.

Normalized



Commanding a Higher Standardsm

Phoenix * Capitol * Camco CapProducts

Certified Material Test Report

Printed: 8/20/2019

Customer

EMCO DISTRIBUTION GROUP PO BOX 5300 STATION A

LONDON, ON N6A 4N7

Certified: 12/18/2018 P.O. 2610174-00

Tag 3050060

Heat No 174321

Heat Code 87AH

Phoenix Order # 1481945

Material ASTM A333 GR6 2015/ASME SA333 GR6 2015 Edition

Part Number

15111512CSA

Description

1-1/2X6 XHSML BK STL NIPL A333 GR6 CSA

Chemical Properties

C	Mn	P	S	Si	Cu	Ni	Cr
0.1300	1.3200	0.0090	0.0050	0.3100	0.0390	0.0200	0.0600
N.C.	1 1/	C-	41	CL	3.7	DL	C-

C Eq. Long	
0.3687	

Mo	V	Co	Al	Cb	N	Pb	Sn	Та	Ti
0.0100	0.0040			0.0180					0.0020

Additional Chemical Properties

В	
0.00030	

Cr	+ Cu + Ni
	0.1190

Mechanical Properties

Tensile (PSI)	Yield (PSI)	Elong. % in 2 in. or 4D	RofA	HBW	HBW2
72,374	55,985	37.0%		150	0

Charpy Minimum Impact - ft/lbs

Test 1	Test 2	Test 3	Average	Test Temp.
48	41	49	46.00	-54

* Bend test passed.

We hereby certify that these parts were manufactured, sampled, tested, and inspected in accordance with the product specifications stated and were found to meet the requirements.

We further certify that this material was inspected using independentinspectors conforming to the requirements of EN 10204 3.1. These products meet the requirements of the latest editions of NACE MR0175, NACE MR0103, and ISO 15156. No weld repair has been performed on these products. This material was not exposed to mercury or any other netal alloy that is liquid at ambient temperatures during processing or while in our possession

Comments:

Flattening test passed. Ultrasonic test passed. Charpy V Impact Tested at -54° C. Specimen size - 10 x 3.33 mm Hot finished, Normalized



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

Date: 9/9/2019

Mill Test Reports

Invoice: 1600715-00

Customer: 27403-261

PO: 2610192

A.B.F. MINES/2985080 CANA 261

1310 AVE DAVY

ROUYN NORANDA, QC J9Y 0A8

CERTIFICATE OF INSPECTION & TEST (EN 10204 3.1)

ST&H CORPORATION
OFFICE - 74, Jwadongsunhwa

OFFICE – 74, Jwadongsunhwan-ro, Haeundae-gu, Busan, Korea PLANT – 11, Fotokoonddan 2-oil, Yanssan-si, Kungnam, Korea



Certificate No.	MIH0290-01/05	Date: FFB 14 2019	Tel: +82.51.744-4680(5 line) Fax: +82.51.744-4670 E-mail: qm@stnhcorp.com
Customer	CCTF CORPORATION		Certified to ISO9001/ ISO14001:2015.PED2014/68/EC by LROA
Contract No.	4039095-00		
Spec. For Material A	I ASTM A105N-18, ASME SA105N-17	, ASTM A350 LF2 CL1-18, ASME SA350 LF2 CL1-1	0 LF2 CL1-18,ASME SA350 LF2 CL1-17,NACE MR0175/ISO 15156-2:2015,NACE MR0103/ISO 17495-1:2016
Heat Treatment	930°C NORMALIZED & A.C.	Dimensio	Dimensional Inspection ASME B16.5 - 2017

										Size	Size of Test		Tens	Tension Test	st	T	Hardness		Char	py Impa	Charpy Impact Test	
									Acres Miles		Specimen		Y.S	T.S.	E.L R	R.A	Test		(10X10n	nm Spe	(10X10mm Specimen Size)	ize)
		ITE	ITEM / SIZE	ш			-	Q'ty	Past No.	0	GL		71	-	6 %	%	(HB)	Indiv.		Ave. N	Notch	Temp.
									Daten No.	mm ,		Max		655		-	187	16J		201	>	-46°C
										12.5	20.0	Min	250	485 2	22.0 30	30.0			Test Result	esult (J)	×	Ave.(J)
7585585	15	SOLBS BL RF 6"	RF 6"					20 B	303459	12.5	50.0		330	520	34 7	76 15	50 156	98	0	75	86	80
7585860	15	SOLBS BL RF 8"	RF 8"					10 B	803459	12.5	50.0		330	520	34 7	1 9	50 156	5 8(0	75	86	80
7580218	15	SOLBS SO RF 8"	RF 8"					20 B	803459	12.5	50.0		330	1230	34 7	76 15	50 156	5 80	0	52	86	80
7580202	15	50LBS SO RF 14"	RF 14"					2 B	03459	12.5	50.0		330	520	34 7	76 15	50 156	5 80		75	86	80
7586502	15	SOLBS TH RF 6"	RF 6"					5 8	303459	12.5	50.0		330	520	34 7	16 15	50 156	5 80		75	86	80
7586824	15	50LBS WN RF STD 4"	N RF STC	74"				50 B	03459	12.5	50.0		330	520	34 7	76 15	50 156	5 8	0	75	86	80
7586832	15	50LBS WN RF STD	V RF STE	9 (30 B	103459	12.5	50.0		330	520	34 7	1 9/	50 156	5 80	0	75	98	80
7586891	15	SOLBS WN RF STD 8"	V RF STE	.8 (20 B	03459	12.5	50.0		330	520	34 7	76 15	50 156	98	0	22	98	80
7583949	30	300LBS WN RF STD 8"	V RF STE	.8"				10 8	803459	12.5	50.0		330	520	34 7	76. 15	50 156	3	0	75	98	80
7585321	15	SOLBS WN RF STD 10"	V RF STL	01 0				20 B	803459	12.5	50.0		330	520	34 7	1 9/	50 156	5 80		75	98	80
								0	Chemical (Composition (%)	tion (%)										NDE	
Heat No./		2	15	Mn	0.	S	ž	ბ	Mo	n)	>	N.				8			CE			
Batch No.	Max	0.300	0.300	1.350	0.035	0.040	0,400	0.300	0.120	0.400	0.080	0.020					H			10	MT	Fq.
803459	I	0.163	0.226	1,230	0.012	0.002	0.057	0.136	0.017	0.147	0.001	0.006						37.7 (37.	0.412			
										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

Witnessed by / H, J, LEE



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

ST-801-14-02



NEWCO® | OIC® | DOUGLAS CHERO™

Tel: 281-302-4900 Fax: 281-302-4801 13127 Trinity Dr., Stafford, TX 77477

Item No: B3080030F*LCCW27B****GA Size/Type: 8" / Swin Country of Orig FigNo: 33F--LCC Quantity: 1

Comp Chem

(%)

ď

Cameron Newco is a 9001 certified registered company

CRN: OC7998.5C - EN 10204-3.1

Item Test Pressure Duration Test
(Mps) (PSI) (sec) Result Pressure Test Result Dimension: Passed Visual: Passed Inspection

MLTS_6056-18734 Description: 300# RF A352-LCC (TRIM 12) BC SWING CHECK Cert# 1087586 Outcomer PO: 2610091-00 Cameron SO: QRC SO# 1007020 Customer Number: 32043 Customer PO: Project Name: Valve Serial No:

Cert No: 1087586

06/17/19

Material Test Report

								Impact	Tests	6-50	deg F	
								Hard (HB)	100.0	225.0	169.0	
									35.0	1.00.0	0.99	
								Blong % Reduct %	22.0	100.0	32.0	
		**						Mald KSI	39.9	6.666	54.4	
		Tag No	1			19183W		Tensile KSI Yield XSI	70.0	95.0	19.0	.F2-B025
	NACE	Customer Tag No:				Heat No: N9183W			Physical	Props	Ī	Heat No: LF2-B025
			_			I		۲			7	I
	Passed		Passed		.34							
	120		120	*	ME B16.							
	1125		825		598 / AS	40						-
	7.757		5.688		Standard: API 598 / ASME B16.34							
1	Shell	Backseat	Seat Hydro	Seat Air	Standar	laterial Code: A352 LCC						Material Code: A350 LF2
	-	Taam.	TOL	NACE	1 1	ode: A:	Notes:	Δ	00.0	0.03	.004	ode: A
		Valve Maceilals meet	the requirements for	os and	MKOT 12	rial Co		Spec: C Cr Cu Mn Mo Ni P S Si V	00.0	09.0	Val: 0.180 0.040 0.018 1.040 0.002 0.014 0.021 0.010 0.520 0.004	rial Co
	The state of	ve mar	redui	TONIA S	- 1	Mate		S	0.00	0.05	0.010	Mate
	1 47-7	TIPA	Luc	- NAC				Q.	00.0	0.040	0.021	
						H		N	00.0	0.50	0.014	
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	4					ij.		Wh	0.00	1.20	1.040	3.1
2	CITEC		ina			Ψ.	ERING	r,	00.0	0.30	0.018	Type:
	ze/lype: 6" / Swillg Clieck		untry of Origin: China	GNO: 33FLCC4/2-NC		Part: Body Type 3.1	Treatment: QUENCHING+TEMPERING	Cr	00.00	0.50	0.040	Part: Bonnet/Cap Type 3.1
	/		Origi	-ICC4		ody 7	JENCHII	Ü	00.00	0.25	0.180	onnet
	Ype:	antity: 1	y of	33F-		art: B	tment: Ql	Spec:	Min:	Max:	Val:	art: B
	722	anti	untr	GNO:		Δ	at Trea		Hell Hell	din 5		σ.

1b/ft # 1: 140 # 2: 18 # 3: 20 Avg: 59

1b/ft. # 1: 36 # 2: 25 # 3: 47 Avg: 36

Impact Tests @-50 deg F

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70.0 95.0 81.2

Physical Props

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Spec:

Chem

(%)

Blong % 22.0 35.0

Tensile KSI Yteld xsi

61/11/90 Signature



NEWCO® | OIC® | DOUGLAS CHERO™

13127 Trinity Dr., Stafford, TX 77477 Tel: 281-302-4900 Fax: 281-302-4801

Litem No: B3080030F*LCCW27B****GA
Size/Type: 8" / Swing Check Country of Origin: China Quantity: 1

FigNo: 33F--LCC4/2-NC

Material Test Report

06/17/19

Cert No: 1087587

Cameron Newco is a 9001 certified registered compa CRN: OC7998.5C - EN 10204-3.1

Standard: API 598 / ASME Ble | Test Pressure | (Mps) (PSI) | 7.757 | 1125 Backseat - - Seat Mydro 5.688 825 Pressure Test Result Item the requirements for NACE MR0103 and NACE MR0175 Valve Materials meet Dimension: Passed Visual: Passed

Material Code: A352 LCC

Part: Body Type 3.1
Heat Treatment: QUENCHING*TEMPER

2

any	Customer: EMCO	32043	MLT	9 8)56-1	MLTS_6056-18734	_
	Customer PO:	2610091-00	Cort	100	Cert# 1087587		
	Cameron SO:			5			
	-, Project Name:						
on Test	Valve Serial No:			100			_
Result	1 Description:	300# RF A352-LCC (TRIM 12) BC SWING CHECK	C (TRIM	12) B(SMING	CHECK	_
Passed	NACE						_
A. C. C.	Customer Tag No:						_
Passed	-						
34							_
	Heat No: N9158W	THE RESERVE OF THE PARTY OF THE	S000000 - 100000	and the same	100		700
							-

	95.0 999.9 100.0 85.6 59.5 33.0	Heat No: LF2-B025	Physical 70.0 36.0 22.0 30.0 1.0 Tosts 12.2 Props 95.0 959.9 100.0 100.0 170.0 69.5 13.2 69.5 13.4 35.0 50.0 170.0 69.5 13.4 13.6 13.
Spec: C Cr Cu Mn Mo N1 P S S1 V	20 0.20 0.50 0.00 0.040 0.05 0.60 0.03	Material Code: A350 LF2	Pec: C Cr Cu Mm Mo ND N0 0.00 0.00 0.10 0.00 0.00 0.00 0.00 0

61/11/90 Signature

Comments: Cameron declares that the parts above are in accordance with applicable material specification and purchase order requirements. No Asbestos is contained in this product. Packing: | Gasket: Graphite Spiral Wound (316)
Valves covered in this certificate are in full compliance with purchase order requirements and specifications.

	11	Marie		AL NUMBER	RECORD
M. A. S	stewa	rt & Sons Ltd.	/	(FORM 4.15.4A)	3
COMPAN	IV. E	ROUND - NOTE	ent KN/FORA	BEMINES)	PAGE; OF
COMPAN	VY;	D	1 00		1/2/201/
		10000100	1000	MAS SALES	
ATTN;		Richard Kn		0	DATE JUNE 10/19
PO#		26/0090	- 00		
ITEM QTY	SIZE	VALVE NO.	BODY	BONNET#/CAP#	ASTUATOR# SOLENOID# INDICATOR#
113/	1811	Beric	HONNE	HCNNC	DF-01-105-180266-12
2		103-RF-AH12-H	DLDRAC	LDRAC	DF-01-306-180901-12
3		1	LDRAC	LDRAC	DF-01-305-180901-12.
7					
8 /	B"	Berio	LDRAC	LDRAC	DF-01-250-180901-12
9		101-RF-AH12-HN	6		
10					
11					
12/2	6"	Beric	GDN71	GDN7/	DF-01-216-190116-12
13		101-RF-AH12-H-N	LDRAC	LDRAC	DF-01-247-180901-12
14					
15					
16	6"	Berio	GDN71	6DN71	DF-01-228-190116-12
17		301-RF-FH12-X-N			
18					
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Beric-Davis Companies International, Ltd. 6059 South Loop East Phone: 713 673-2073 Houston, TX 77087 Fax: 713 673-4641

MATERIAL TEST REPORT

(CHEMICAL, PHYSICAL & HYDROSTATIC)

Q'ty: 1 Pcs TAG NO.: 103-08-RF-AH12-H-N 300 Class Rating:

SIZE: NPS 8

DATE: SEP.1.2018 ARTICLE: 8 GATE VALVE RF 300 TRIM 12

FIGURE. NO.: 103-08-RF-AH12-H-N SERIAL NO.: DF-01-305-180901-12

	9	VISUAL TEST	MELLAL	VISUAL	MSS-SP-55	G00D
Stem	A182 F316	.34 & API 598)	BACK SEAT	(PSIG)	815	G009
		PRESSURE TEST (ASME B16.34 & API 598)	SEAT(Air)	(PSIG)	80	G005
Body Seat Ring	A350 LF2+HF	PRESSURE T	SHELL	(PSIG)	1125	GOOD
Body S	A350		Boft Hole	Diameter	25	T.W.
Wedge/Disc (WD/DS)	A352 LCC+316		No. of	Bolt Hole	12	T.W.
Wedge/D	A352	(mm)	Flange	Thickness	42	T.W.
Bonnet (BN)	A352 LCC		Dia. Of	Raised Face	270	T.W.
80)	CC	PECTION	Closi O #10 a	DOIL CITCLE	330	T.W
Body (BD)	A352 LCC	DIMENSION INSPECTION	Flange	Diameter	381	T.W
ME	ASTM	DIME	Face to Face	(End to End)	419±1.6	*W.T
PARTS NAME	MATERIAL		INCITODIGINI	MOLECTION	STANDARD	RESULT

A352 LCC Min. 0.250 0.600 1.200 0.045 0.500 0.500 0.200 0.300 0.03	SEDIAI NO BATCH	DADTC	HEAT				CHEMI	CAL CO	CHEMICAL COMPOSITION (%) (ASTM STD.)	MOIL	(ASTA	A STD.)		110	NSION TE	TENSION TEST (MIN.) (ASTM)		HARDNESS	CHARPY
A352 LCC Min. 0.256 0.600 1.200 0.040 0.045 0.500 0.200 0.300 0.030 0.030 0.030 0.030 0.030 0.030 0.030 0.030 0.030 0.030 0.030 0.045 0.500 0.04	TO T		NUMBER		Si	Mn	d.	S		Ö	_		^	(MPa	$\stackrel{\sim}{\sim}$	1%	8	(HB)	
BODY LDRAC 0.210 0.420 0.960 0.006 0.013 0.015 0.060 0.010 0.010 0.001 0	STANDARD	A352 LCC	Min. Max.	0.250	0.800	1.200	0.040	0.045	.500 0			300 0	030	485	275	22.0	35.0	237	Min≥16, Avg≥20,
BODY LDRAC 0.210 0.420 0.060 0.013 0.015 0.060 0.010 0.010 0.001 0																			
0.960 0.006 0.013 0.015 0.060 0.010 0.001 0.001 563 352 29 0 53.0 160 0.960 0.006 0.013 0.015 0.006 0.010 0.010 0.001 563 352 29 0 53.0 160 0.960 0.006 0.013 0.015 0.060 0.010 0.001 0.001 563 352 29 0 53.0 160 0.960 0.006 0.015 0.001 0.001 0.001 563 352 29 0 53.0 160 0.960 0.006 0.016 0.001 0.																			
0.960 0.006 0.013 0.015 0.060 0.010 0.001 0.001 563 352 28.0 53.0 160 0.960 0.006 0.013 0.015 0.000 0.001 0.001 0.001 563 352 28.0 53.0 160 0.960 0.006 0.013 0.015 0.000 0.001 0.00)F-01-305-180901-12		LDRAC	0.210	0.420	0.960	900.0	0.013	0 2100	0 090	010	0 010	1001	563	352	29.0	53.0	160	46-38-32
0.960 0.006 0.013 0.015 0.060 0.010 0.001 0.001 563 352 28.0 53.0 160		BONNET	LDRAC	0.210		096'		_					1001	563	352	29.0	53.0	160	46-38-32
		WEDGE/DISC	LDRAC	0.210	0.420	0.96.0							.001	563	352	29.0	53.0	160	46-38-32
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REMARKS

IN ACCORDANCE WITH EN 10204.3.1 HEAT TREATMENT, LCC QUENCHED, 930°C X 3HR(W.C.)+TEMPERED 700°C X 3HR(A.C.) TO NACE MR0103

A-SEX game

Witness Inspector

Manager, Q.A Department



Beric-Davis Companies International, Ltd.

MATERIAL TEST REPORT

(CHEMICAL, PHYSICAL & HYDROSTATIC)

6059 South Loop East Houston, TX 77087 Phone: 713 673-2073

NPS 8

SIZE

Fax: 713 673-4641

Q'ty: 1 Pcs TAG NO.: 103-08-RF-AH12-H-N 300 Class Rating:

BERIC

DATE: SEP.1.2018
ARTICLE: 8 GATE VALVE RF 300 TRIM 12
FIGURE. NO.: 103-08-RF-AH12-H-N
SERIAL NO.: DF-01-306-180901-12

	9	VISUAL TEST	MELLAL	VISONE	MSS-SP-55	G000
Stem	A182 F316	34 & API 598)	BACK SEAT	(PSIG)	815	G005
		PRESSURE TEST (ASME B16.34 & API 598)	SEAT(Air)	(PSIG)	80	G005
Body Seat Ring	A350 LF2+HF	PRESSURE T	SHELL	(PSIG)	1125	G009
Body S	A350		Bolt Hole	Diameter	25	T.W.
Wedge/Disc (WD/DS)	A352 LCC+316		No. of	Bolt Hole	12	T.W
Wedge/D	A352	(ww)	Flange	Thickness	42	T.W.
Bonnet (BN)	A352 LCC		Dia. Of	Raised Face	270	T.W.
30)	22.	ECTION	olosi O slod	DOIL OILCIG	330	W.T
Body (BD)	A352 LCC	DIMENSION INSPECTION	Flange	Diameter	381	W.T
ME	ASTM	DIME	Face to Face Flange	(End to End) Diameter	419±1.6	¥.W.⊤
PARTS NAME	MATERIAL		MOITOBBOM	INSTECTION.	STANDARD	RESULT

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A352 LCC BODY BONNET WEDGE/DISC			HEAT				CHEMI	00 100	MPOSIT	TION 196	1 /ACTA	ASTO		TEN	ISION TE	TENSION TEST(MIN.) (ASTM)	(ASTM)	HARDNESS	CHARPY
A352LCC Min. 0.250 0.600 1.200 0.046 0.500 0.500 0.200 0.030	SERIAL NO. BATCH	PARTS	NI WADE				CHEMI	2010	D LIM	NOW LX	1100/6	200		S.T		EL.	R.A	1007	
A352.LCC Min. 0.256 0.600 1.200 0.046 0.500 0.500 0.300 0.030 0.030 0.030 0.030 0.030 0.030 0.030 0.030 0.030 0.030 0.030 0.030 0.030 0.030 0.030 0.030 0.030 0.030 0.030 0.045 0.500 0.045 0.04			NOMBER	O	S	Mn	Ь	S	Z		_	Cu	>	(MPa	=	%	%	(GL)	
BODY LDRAC 0.210 0.420 0.960 0.006 0.013 0.015 0.060 0.010 0.001 0	STANDARD	A352 LCC	Min. Max.	0.250	0.600	1.200	0.040	0.045	.500 0	.500	200 0	300 0	030	485	275	22.0	35.0	237	Min≥16J Avg≥20J
BODY LDRAC 0.210 0.420 0.960 0.006 0.013 0.015 0.060 0.010 0.010 0.001 663 352 29.0 53.0 160 BONNET LDRAC 0.210 0.420 0.960 0.006 0.013 0.015 0.060 0.010 0.010 0.001 663 352 29.0 53.0 160 WEDGE/DISC LDRAC 0.210 0.420 0.960 0.006 0.013 0.015 0.060 0.010 0.010 0.001 663 352 29.0 53.0 160 WEDGE/DISC LDRAC 0.210 0.420 0.960 0.006 0.013 0.015 0.060 0.010 0.010 0.001 663 352 29.0 53.0 160																			
BODY LDRAC 0.210 0.420 0.006 0.013 0.016 0.010 0.010 0.001 0.010 0.001 0.010																			
0.960 0.006 0.013 0.015 0.060 0.010 0.001 0.001 563 352 28.0 53.0 160 0.960 0.006 0.013 0.015 0.060 0.010 0.001 0.001 563 352 28.0 53.0 160	F-01-306-180901-12		LDRAC	0.210	0.420					-		010	1.001	563	352	29.0	53.0	160	46-38-32
0.960 0.006 0.013 0.015 0.010 0.010 0.001		BONNET	LDRAC	0.210	0.420	096.0	900.0	0.013		_		010.	1.001	563	352	29.0	53.0	160	46-38-32
		WEDGE/DISC	LDRAC	0.210	0.420	0.960			0 510.1			010	1.001	563	352	29.0	53.0	160	46-38-32
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REMARKS

IN ACCORDANCE WITH EN 10204.3.1 HEAT TREATMENT; LCC QUENCHED; 930°C X 3HR(W.C)+TEMPERED 700°C X 3HR(A.C) TO NACE MR0103

game

Witness Inspector

Manager, Q.A Department

ALEX

(CHEMICAL, PHYSICAL & HYDROSTATIC)

Beric-Davis Companies International, Ltd. 6059 South Loop East TAG NO.: 103-08-RF-AH12-H-N

Class Rating:

DATE: FEB.6.2018

NPS 8 SIZE Phone: 713 673-2073 Fax: 713 673-4641 Houston, TX 77087

ARTICLE: 8 GATE VALVE RF 300 TRIM 12 FIGURE. NO.: 103-08-RF-AH12-H-N

Q'ty: 1 Pcs

		VISUAL TEST	VISTIAL	VISUAL	MSS-SP-55	GOOD
Stem	F316	.34 & API 598)	BACK SEAT	(PSIG)	825	GOOD
		PRESSURE TEST (ASME B16.34 & API 598)	SEAT(AIR)	(PSIG)	80	G005
Body Seat Ring	LF2+HF	PRESSURE 1	SHELL	(PSIG)	1125	GOOD
Body S	LF2		Bolt Hole	Diameter	25	T.W.
Wedge/Disc (WD/DS)	A352 LCC+316		No. of	Bolt Hole	-12	W.T
Wedge/D	A352	(mm)	Flange	Thickness	42	W.T
Bonnet (BN)	A352 LCC		Dia. Of	Raised Face	270	W.T
(BD)	CCC	PECTION	0	סוו כווכום	330	W.T
Body (BD)	A352 LCC	DIMENSION INSPECTION	Flange	Diameter	381	T.W
ME	ASTM	DIME	Face to Face Flange	(End to End) Diameter	419±1.6	* W.T
PARTS NAME	MATERIAL		INCIPCITION	INSTECTION	STANDARD	RESULT

CHARPY			Min≥16J	Avg≥20J		36-40-39	36-40-39	36-40-39						
HARDNESS	Vany	(GLI)		237		172	172	172						
(ASTM)	R.A	%	35.0			61.0	61.0	61.0						
-	EL	%	22.0			31.0	31.0	31.0		E				
TENSION TEST(MIN	Y.P	(MPa)	275			435	435	435						
TEN	T.S	(MPa)	485	655		612	612	612						
	,	>		0.030		0.007	0.007	0.007						
TANCTO	CHEMICAL COMPOSITION (%) (ASTM STD.)	Cu					0.021							
10/1/07	(70) (AS	Mo		0.200		0.011 0.005 0.047 0.014 0.021	0.014	0.014 0.021						
MOITION	NOLLIO	ပ်		1.200 0.040 0.045 0.500 0.500 0.200		0.047	0.047	0.047						L
OGMO	ONINO	ž		0.500		0.005	0.005	0.011 0.005						
0 1701	ICAL C	S		0.045			0.011	0.011			/	/	1	
CUEAN	CHEN	۵.	1	0.040		0.021	0.021	0.021		/	-	4	1	
		Mn		1.200		0.999	0.999	0.999	<	0	*	/		
		Si		0.600		0.399	0.399	0.399		1				
		O		0.250		0.181	0.181	0.181						
HEAT	NI IMPED	NOMBER	Min.	Max.	N.	HCNNC 0.181	HCNNC 0.181	HCNNC						
	PARTS		A352100	2007		ВОДУ	BONNET	WEDGE/DISC HCNNC 0.181						
	SERIAL NO. BATCH		CTANDARD			DF-01-105-180206-12	7 2							

REMARKS:

IN ACCORDANCE WITH EN 10204.3.1 HEAT TREATMENT; LCC QUENCHED; 930°C X 3HR(W.C)+TEMPERED 700°C X 3HR(A.C) TO NACE MR0103

Manager, Q.A Department Witness Inspector

A-SEX

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(CHEMICAL, PHYSICAL & HYDROSTATIC)

Beric-Davis Companies International, Ltd.

6059 South Loop East

TAG NO.: 101-06-RF-AH12-H-N Phone: 713 673-2073 Houston, TX 77087

ARTICLE: 6 GATE VALVE RF 150 TRIM 12 FIGURE. NO.: 101-06-RF-AH12-H-N

DATE: SEP.1.2018

BERIC

SERIAL NO.: DF-01-247-180901-12

Q'ty: 1 Pcs

150

Class Rating:

NPS 6

SIZE:

Fax: 713 673-4641

PARTS NAME Body (BD) Bonnet (BN) Wedge/Disc (WD/DS) Body Seat Ring Stem MATERIAL ASS2 LCC ASS2 LCC ASS2 LCC+316 ASS0 LF2+HF A182 F316 INSPECTION Inspection<
NAME Body (BD) Bonnet (BN) Wedge/Disc (WD/DS) Body Se Body
NAME Body (BD) Bonnet (BN) Wedge/Disc (WD/DS) Body Se Body
NAME Body (BD) Bonnet (BN) Wedge/Disc (WD/DS) ASTM A352 LCC A352 LCC A352 LCC+316 ASTM A352 LCC A352 LCC+316 A352 LCC+316 Face to Face Flange No. of Bolt Face to Face Flange No. of Bolt Face to Face Inimeter No. of Bolt Face to Face Inimeter No. of Bolt Astrict Astrict Astrict Astrict
NAME Body (BD) Bonnet (BN) Wedge/Disc (Nedge/Disc (N
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ASTM Body (BD)
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ASTM ASTM Face to F (End to E 267±1.
MATERIAL MATERIAL INSPECTION STANDARD RESHIT

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HOLDE ON BATCH		HEAT				CHEMIC	LAL CO	CHEMICAL COMPOSITION (%) (ASTM STD.)	(%) NO	(ASTM	STD.)			TENS	ION TES	TENSION TEST(MIN.) (ASTM)		HARDNESS	CHARPY
SENIAL INC. DATE	PARTS	NUMBER			1						201			S.	Υ.Ρ	1	R.A	(HB)	
			O	S	Mn	۵.	S	Z	5	Mo	Cu		_	MPa)	(MPa)	%	%	(
STANDARD	A352 LCC	Min.	0.250	0 250 0 600 1		0 040	045 0	200 0 040 0 045 0 500 0 500 0 300 0 330	500 0	200 00	0 00	130		485	275	22.0	35.0	237	Min≥16J Ava≥20J
									-										
DF-01-247-180901-12	ВОДУ	LDRAC 0.210 0.420	0.210		0.960	0.006	0.013 0	0.015 0.	0.060 0.0	0.010 0.0	0.010 0.001	100		563	352	29.0	53.0	160	46-38-32
	BONNET	LDRAC	0.210 0.420		0.960	0.006	0.013 0	0.015 0.	0.060 0.0	0.010 0.0	0.010 0.001	100		563	352	29.0	53.0	160	46-38-32 -
	WEDGE/DISC LDRAC 0.210 0.420 0.	LDRAC	0.210	0.420	960	0.006 0.013 0.015	0.013 0	_	0.060 0.0	0.010 0.0	0.010 0.001	100		563	352	29.0	53.0	160	46-38-32
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IN ACCORDANCE WITH EN 10204.3.1 REMARKS:

HEAT TREATMENT; LCC QUENCHED; 930°C X 3HR(W.C)+TEMPERED 700°C X 3HR(A.C) TO NACE MR0103

Witness Inspector

game

Manager, Q.A Department



(CHEMICAL, PHYSICAL & HYDROSTATIC)

TAG NO.: 101-06-RF-AH12-H-N

Beric-Davis Companies International, Ltd. 6059 South Loop East

NPS 6 SIZE Phone: 713 673-2073 Fax: 713 673-4641 Houston, TX 77087

DATE: JAN.16.2019

ARTICLE: 6 GATE VALVE RF 150 TRIM 12 FIGURE, NO.: 101-06-RF-AH12-H-N SERIAL NO.: DF-01-216-190116-12

Q'ty: 1 Pcs

150

Class Rating:

		1	-				
	2		PRESSURE TEST (ASME B16.34 & API 598) VISUAL TEST	VICTIAL	VISORE	MSS-SP-55	COOD
Stem	A182 F316		.34 & API 598)	SEAT(Air) BACK SEAT	(PSIG)	320	GOOD
			EST (ASME B16	SEAT(Air)	(PSIG)	80	COOD
Body Seat Ring	A350 LF2+HF		PRESSURE TI	SHELL	(PSIG)	450	COOD
Body S	A350 I		0.00	Bolt Hole	Diameter	22	TW
Wedge/Disc (WD/DS)	A352 LCC+316			No. of	Bolt Hole	8	TW
Wedge/D	A352		(mm)	Flange	Thickness	26	TW
Bonnet (BN)	A352 LCC			Dia, Of	Raised Face	216	TW
(GB	CC		PECTION	ologi O #o B	BOIL CITCLE	241.5	TWI
Body (BD)	A352 LCC		DIMENSION INSPECTION	Flange	Diameter	279	TW
ME	ASTM		DIME	Face to Face Flange	(End to End) Diameter	267±1.6	™ ×
PARTS NAME	MATERIAL			MODECTION	INSPECTION	STANDARD	PESHIT

*

SERIAL NO. BATCH	PARTS	HEAT				CHEMIL	CAL CO	MPOSI	MOIL	CHEMICAL COMPOSITION (%) (ASTM STD.)	M STD.)		TEN	SION TE	TENSION TEST (MIN.) (ASTM)		HARDNESS	CHARPY
MICSER	0.5750000000000000000000000000000000000	NUMBER	O	is	Mn	Ь	S	ž	Ö	Mo	Cu	>	(MPa	(MPa)	%	%	(HB)	
STANDARD	A352 LCC	Min. Max.	0.250 0.600	2250	1.200	0.040	3.045	0.500).500 C	1.200 0.040 0.045 0.500 0.500 0.200 0.300 0.030	300 0	000.	485	275	22.0	35.0	237	Min≥16J Avg≥20J
DF-01-216-190116-12	BODY	GDN71	0.200	0.480	1.140	0.027	0.014	0.015	0.103 0	0.028 0	0.028 0	0.002	534	348	32.0	55.0	151	33-37-40
	BONNET	GDN71	0.200 0.480	STORY !	1.140	0.027	0.014	0.015	0.103 0	0.028 0	0.028	0.002	534	348	32.0	55.0	151	33-37-40
	WEDGE/DISC GDN71 0.200 0.480	GDN71	0.200	0.00	1.140 0.027	0.027	0.014	0.015	0.103	0.014 0.015 0.103 0.028 0.028 0.002	0.028	1.002	534	348	32.0	55.0	151	33-37-40
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REMARKS:

HEAT TREATMENT; LCC QUENCHED; 930 $^\circ$ C X 3HR(W.C)+TEMPERED 700 $^\circ$ C X 3HR(A.C) TO NACE MR0103 IN ACCORDANCE WITH EN 10204.3.1

Products supplied are in compliance with the requirements of the purchase order Valve design and construction is in accordance with API 600, ASME B16.34

game

Manager, Q.A Department

Witness Inspector



(CHEMICAL, PHYSICAL & HYDROSTATIC)

Beric-Davis Companies International, Ltd. 6059 South Loop East

TAG NO.: 101-08-RF-AH12-H-N Class Rating: 150

NPS 8

SIZE:

Phone: 713 673-2073 Houston, TX 77087 Fax: 713 673-4641

Q'ty: 1 Pcs

DATE: SEP.1.2018 ARTICLE: 8 GATE VALVE RF 150 TRIM 12

BERIC

FIGURE, NO. : 101-08-RF-AH12-H-N SERIAL NO. : DF-01-250-180901-12

	316	3) VISUAL TEST		VISUAL	MSS-SP-55	G005
Stem	A182 F316	3.34 & API 598	BACK SEAT	(PSIG)	315	G005
		PRESSURE TEST (ASME B16.34 & API 598)	SEAT(Air)	(PSIG)	80	GOOD
Body Seat Ring	A350 LF2+HF	PRESSURET	SHELL	(PSIG)	450	G009
Body S	A350		Bolt Hole	Diameter	22	T.W.
Wedge/Disc (WD/DS)	4352 LCC+316		No. of	Bolt Hole	8	T.W.
Wedge/D	A352	(mm)	Flange	Thickness	29	W.T
Bonnet (BN)	A352 LCC		Dia. Of	Raised Face	270	T.W.
(DB)	CC	PECTION	Olosi O stolo	poli cilcie	298.5	T.W.
Body (BD)	A352 LCC	DIMENSION INSPECTION	Flange	Diameter	343	T.W.
ME	ASTM	DIME	Face to Face	(End to End) Diameter	292±1.6	*W.T
PARTS NAME	MATERIAL		MODECTION	INSPECTION	STANDARD	RESULT

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	SFRIAI NO BATCH	PARTS	HEAT				CHEM	CHEMICAL COMPOSITION (%) (ASTM STD.)	MPOSI	MOIL	() (AST	M STD.)			TEN	SION TES	TENSION TEST(MIN.) (ASTM)		HARDNESS	CHARPY
A352 LCC Min. 0.256 0.600 1.200 0.040 0.045 0.500 0.200 0.300 0.030 0.030 0.030 0.030 0.030 0.030 0.030 0.030 0.030 0.030 0.030 0.030 0.030 0.030 0.045 0.040 0.04			NUMBER	O	S	Min	d	S	ź	-	-	Cu	/	-	(MPa)	(MPa)	%	%	(HB)	
Max. 0.250 0.600 1.200 0.040 0.045 0.500 0.050 0.010 0.010 0.030 Control 0.030 0.030 Control 0.045 0.0	STANDARD	A352 LCC	Min.	-					-						485	275	22.0	35.0	7000	Min≥16J
BODY LDRAC 0.210 0.420 0.960 0.006 0.013 0.015 0.060 0.010 0.010 0.001 0.001 563 352 29.0 53.0 160 BONNET LDRAC 0.210 0.420 0.960 0.006 0.013 0.015 0.060 0.010 0.010 0.001 563 352 29.0 53.0 160 WEDGEDISC LDRAC 0.210 0.420 0.960 0.006 0.013 0.015 0.060 0.010 0.010 0.001 563 352 29.0 53.0 160 WEDGEDISC LDRAC 0.210 0.420 0.960 0.006 0.013 0.015 0.060 0.010 0.010 0.001 0.001 563 352 29.0 53.0 160			Max.	0.250	0.600	1.200	0.040	0.045	0.500		0.200	3000	.030	-	655				757	Avg≥20J
BODY LDRAC 0.210 0.420 0.960 0.006 0.013 0.015 0.060 0.010 0.001 0.001 563 352 29.0 53.0 160 BONNET LDRAC 0.210 0.420 0.960 0.006 0.013 0.015 0.060 0.010 0.001 0.001 563 352 29.0 53.0 160 WEDGE/DISC LDRAC 0.210 0.420 0.960 0.006 0.013 0.015 0.060 0.010 0.010 0.001 563 352 29.0 53.0 160 WEDGE/DISC LDRAC 0.210 0.420 0.960 0.006 0.013 0.015 0.010 0.010 0.001 563 352 29.0 53.0 160																				
BODY LDRAC 0.210 0.420 0.960 0.006 0.013 0.015 0.010 0.010 0.001 0																				
960 0.006 0.013 0.015 0.060 0.010 0.001 0.001 563 352 28.0 53.0 160 960 0.006 0.013 0.015 0.060 0.010 0.001 0.001 563 352 28.0 53.0 160	DF-01-250-180901-12		LDRAC	0.210		0.960		0.013				0,010	1001		563	352	29.0	53.0	160	46-38-32
960 0.006 0.013 0.015 0.060 0.010 0.001 0.001 563 352 29.0 53.0 160		BONNET	LDRAC	0.210	0.420	0.96.0		-	-	_	-		1001		563	352	29.0	53.0	160	46-38-32
		WEDGE/DISC	LDRAC	0.210	0.420	0.960	900.0	0.013	J.015 C			010.0	1001		563	352	29.0	53.0	160	46-38-32
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REMARKS:

IN ACCORDANCE WITH EN 10204.3.1 HEAT TREATMENT; LCC QUENCHED; 930°C X 3HR(W.C)+TEMPERED 700°C X 3HR(A.C) TO NACE MR0103

Witness Inspector

Manager, Q.A Department

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A-SEX

Valve design and construction is in accordance with API 600, ASME B16.34 Products supplied are in compliance with the requirements of the purchase order



(CHEMICAL, PHYSICAL & HYDROSTATIC)

Beric-Davis Companies International, Ltd.

6059 South Loop East

TAG NO.: 301-06-RF-FH12-X-N Class Rating: NPS 6 SIZE Phone: 713 673-2073 Houston, TX 77087 Fax: 713 673-4641

ARTICLE: 6 CHECK VALVE RF 150 TRIM 12 DATE: JAN.16.2019

BERIC

FIGURE. NO.: 301-06-RF-FH12-X-N

SERIAL NO.: DF-01-228-190116-12

Q'ty: 1 Pcs

150

9	VISUAL TEST	MELLAL	VISOAL	MSS-SP-55	G00D
A182 F31	.34 & API 598)	BACK SEAT	(PSIG)	N/A	N/A
	TEST (ASME B16	SEAT(Hydro)	(PSIG)	320	G005
LF2+HF	PRESSURE 1	SHELL	(PSIG)	450	G005
A350		Bolt Hole	Diameter	22	T.W.
LF2+316		No. of	Bolt Hole	8	T.W.
A350	(mm)	Flange	Thickness	26	W.T
A352 LCC		Dia. Of	Raised Face	216	W.T
CCC	PECTION	ologi O Hod	ממו כוומפ	241.5	W.T
A352	ENSION INS	Flange	Diameter	279	W.T
ASTM	DIMI	Face to Face	(End to End)	356±1.6	× W.⊤
MATERIAL		MOLECTION	INCLEO TON	STANDARD	RESULT
	. ASTM A352 LCC	ASTM A352 LCC A352 LCC A350 LF2+316 A350 LF2+HF DIMENSION INSPECTION (mm) PRESSURE TEST (ASME B16.34 8	ASTM A352 LCC A352 LCC A350 LF2+316 A350 LF DIMENSION INSPECTION (mm) (mm)	ASTM A352 LCC A352 LCC A352 LCC A352 LF2+316 A350 LF2+316 A35	ASTM AS52 LCC A352 LCC A350 LF2+316 A350

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A352 LCC Min. 0.250 0.600 1.200 0.045 0.500 0.200 0.300 0.03	SERIAL NO BATCH	PARTS	HEAT				CHEMI	CAL CO	CHEMICAL COMPOSITION (%) (ASTM STD.)	%) NOL	(ASTA	(STD.)		TEN	ISION TE	TENSION TEST(MIN.) (ASTM)	(ASTM)	HARDNESS	CHARPY
A352 LCC Min. 0.250 0.600 1.200 0.040 0.045 0.500 0.300 0.300 0.030 0.030 0.030 0.030 0.030 0.030 0.040 0.040 0.040 0.040 0.020 0.030 0.030 0.030 0.030 0.030 0.040 0.040 0.040 0.040 0.020 0.04			NUMBER		Si	Mn	Ь	S	H	-		-	/	(MPa)	(MPa)	%	%	(HB)	
LF2 Min. 0.300 0.15 0.000 0.300 0.120 0.400 0.300 0.120 0.400 0.080 0.655 250 22.0 30.0	STANDARD	A352 LCC	Min. Max.	0.250	0.600	1.200	-		.500		200 0.	300 0.	030	485	275	22.0	35.0	237	Min≥16J Avg≥20J
BODY GDN71 0.200 0.480 1.140 0.027 0.014 0.015 0.103 0.028 0.002 0.002 534 348 32.0 55.0 BONNET GDN71 0.200 0.480 1.140 0.027 0.014 0.015 0.103 0.028 0.028 0.002 534 348 32.0 55.0 WEDGE/DISC 1606106 0.230 0.240 1.210 0.015 0.001 0.010 0.020 0.010 0.001 0.0		LF2	Min. Max.	0.300	0.15	0.60		3.040 C	400 0		120 0.	400 0.	080	485	250	22.0	30.0		Min≥16J Avg≥20J
BODY GDN71 0.200 0.480 1.140 0.027 0.014 0.015 0.103 0.028 0.028 0.020 0.020 0.029 0.028 0.029																		*	
0.480 1.140 0.027 0.014 0.015 0.103 0.028 0.028 0.002 534 348 32.0 55.0 0.240 1.210 0.015 0.001 0.002 0.010 0.001	F-01-228-190116-12		GDN71	0.200	0.480	1.140				103 0.			.002	534	348	32.0	55.0	151	33-37-40
0.240 1.210 0.015 0.001 0.010 0.020 0.010 0.001 0.001 535 325 34.0 69.0		BONNET	GDN71	0.200	0.480	40		-					.002	534	348	32.0	55.0	151	33-37-40
		WEDGE/DISC	1606106	0.230	0.240						-		.001	535	325	34.0	0.69	165	27-28-29
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REMARKS:

IN ACCORDANCE WITH EN 10204.3.1 HEAT TREATMENT; LCC QUENCHED; 930°C X 3HR(W.C)+TEMPERED 700°C X 3HR(A.C) TO NACE MR0103

game

Manager, Q.A Department

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Witness Inspector

MLTS_6056-18734 Cert# GATE POWELL

	/a = 1	HEAT / SERIA	AL NUMBER	RECORE)
	art & Sons Ltd.	/.	(FORM 4.15.4A)	(40)	. /
COMPANY;	Erreo/EQuipm	ent KN/FORA	BEMINES)	PAGE;	/ OF /
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VALVE CERTIFICATION

CERTIFIED MATERIAL TEST REPORT/CERTIFICATE OF CONFORMANCE CERTIFIED TO ISO 9001 QUALITY STANDARDS

M. A. STEWART & SONS LTD.

1001802 904159

CUSTOMER PO #: POWELL ORDER:

CUSTOMER:

CERTIFICATE NUMBER:

DATE:

7F19226

7/15/15

2503 Spring Grove Ave. Cincinnati, OH 45214 U.S.A info@powellvalves.com Tel: 513-852-2000

PRESSURE TEST API-598 Standard: PASS PASS N/A (Values are PSI minimums) 1125 N/A 80 SEAT (HYDRO) BACKSEAT SEAT (AIR) SHELL

PASS

Bolted Bonnet Cast Steel Valves Valve Inspection and Testing following industry standards: API 600 **API 602** API 598 NSPECTION

PASS PASS PASS Dimensional: Operational: Visual:

We certify that the valve meets the requirements of one or more of the

CLASS 300, BOLTED BONNET, GATE VALVE, FLG END, A352 LCC, API TRIM 8,

GRAPHITE PACKING, S.W. GRAPHITE GASKET

8.0 3003FK8GXXX

ITEM NUMBER:

DESCRIPTION:

Bolted Bonnet Cast Stainless Steel Valves Fugitive Emissions Forged Valves API 622/624 API 603

End to End Dimensions

ASME B16.10

Casting Surface Inspection Valve Markings /alves **ASME B16.34** MSS SP25 MSS SP55

152

62.0

30.0

53.9

76.4

무

Reduct%

Yield (KSI)

Fensile (KSI)

PHYSICAL PROPERTIES Elong% A352LCC MATERIAL: HEAT NO: C5CL54 COMPONENT DATA (Chemical Properties) BODY

Normalized 1650°F Min, Liquid Quench, Temper 1100°F Min

.001 >

.031 CC

.015

.047 CR

214

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.86

.432

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152 里 PHYSICAL PROPERTIES Reduct% 62.0 Elong% 30.0 Yield (KSI) 53.9 Tensile (KSI) 76.4 MATERIAL: A352LCC .001 > .031 CC HEAT NO: C5CL54 .015 OM .047 CR 214 Z .011 S .019 Ω, Z 86 **BONNET/CAP** .432 S 19 O

Normalized 1650°F Min, Liquid Quench, Temper 1100°F Min

	모	159	
OPERTIES	Reduct%	62.0	
PHYSICAL PROPER	Elong%	31.0	
PH	Yield (KSI)	66.1	
	Tensile (KSI)	91.6	
A352LCC			
MATERIAL:			
	>	900.	
	CO	.026	
5C680	MO	700.	NOOL BA
NO: C5C68	CR	.058	440
HEAT	Z	.274	1
	S	600.	F 4-
	۵	.022	1 1
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()	SI	.446	TOP TO
DISC	O	197	NI.

Normalized 1650°F Min, Liquid Quench, Temper 1100°F Min

CHARPY IMPACT RESULT

SHELL TEST: 10 MIN MINIMUN DURATION

TEST TEMPERATURE (DEGREES F) AVG OF 3 SPEC., MIN. OF 2 SPEC. MIN. OF 1 SPECIMEN (FT-LB) DISC 34.6 37.6 -20 BONNET/CAP 28.7 28.7 -50 BODY 28.7 28.7 20 WE CERTIFY THAT THE ABOVE PRODUCT(S) CONFORM TO THE APPLICABLE REQUIREMENTS OF THE PURCHASE ORDER. THESE RESULTS ARE IN ACCORDANCE WITH EN 10204 TYPE 3.1. http://www.powellvalves.com

CERTIFIED TO ISO 9001 QUALITY STANDARDS

CERTIFIED TO ISO 9001 QUALITY STANDARDS

Why E. fanter B. Quality Manager THE WM. POWELL COMPANY Form F.10.6 2/23/11

WE CERTIFY THAT THE ABOVE PRODUCT(S) CONFORM TO THE APPLICABLE REQUIREMENTS OF THE PURCHASE ORDER. THESE RESULTS ARE IN ACCORDANCE WITH EN 10204 TYPE 3.1. http://www.powellvalves.com



Apollo Valves

Division of Conbraco Industries Conway, SC 29526

FAX: 843/347-1773 PHONE: 843/347-4666



MLTS_6056-18735 Cert# BV APOLLO

MATERIAL TEST REPORT

We certify that the below listed components were manufactured, tested, and inspected in accordance with the requirements of the procurement documents as stated.

	HARDNES S (RB unless noted)	. 08	77	81	7.9
	%RA	74	65	29	70
	%ELO 2"	25	30	31	27
	YIELD	54270	53506	54730	52937
	TENSILE	81002	79634	83872	77629
	Cb				0
iasdom LTD imber: 19503 : 83L-248-24 B36652	>	0.0027	0.0025	0.003	0.0023
Customer Name: Masdom LTD Customer Order Number: 19503 Valve Part Number: 83L-248-24 User Tag Number: B36652	Cu	0.0443	0.0433	0.115	0.0327
	Mo	0.0134	0.0047	0.012	0.0052
	Z	0.0341	0.0364	0.038	0.0216
	Cr	0.1313	0.064	0.061	0.0273
	Si	0.2577	0.3772	0.334	0.2952
	SO	0.0128	0.0138	0.008	0.0115
) TCC(TCC	a	0.0109	0.0123	0.014	0.0139
TM A352-1	Mn	1.3639	1.3903	1.34	1.314
r. 831 fication: AS	C	0.1965	0.1901	0.197	0.2085
Model Number: 831 Size: 2" Quantity: 8 Material Specification: ASTM A352-18 LCC(LCC)	Heat Code	AX	BW	ПН	KW

Charpy Impact Test: Conducted in accordance with ASTM A370 Sections 19 Through 20. Standard full size test specimen.

Test 3	46.67	21.2	20.4	22.2
Test 2	29.95	20.4	20.8	23.6
Test 1	32.95	20	23.2	22.8
Average of 3 Test	36.52	20.5333	21,4667	22.8667
Heat Code			HU	
Test Temperature: -50F	107			

API 598, ASME B16.34, MSS SP-61 and MSS SP-72. Valves designed to the requirements of MSS SP-110, are tested to meet or exceed the requirements of MSS SP-110. Specification sheets are available at www.apollovalves.com.

We certify that the above listed components meet the requirements of the procurement documents as stated. This material certificate complies with EN 10204-2004 Type 3.1 (formerly Type F3.1.B).

The above listed information is certified to be true and accurate to the best of my knowledge and belief.

Date: Signed:

Steve Cowseny 08/01/19 *A*

Quality Assurance Manager



Division of Conbraco Industries Apollo Valves

FAX: 843/347-1773 Conway, SC 29526

PHONE: 843/347-4666



MATERIAL TEST REPORT

We certify that the below listed components were manufactured, tested, and inspected in accordance with the requirements of the procurement documents as stated.

Customer Order Number: 19503 Valve Part Number: 83L-245-24

User Tag Number: B36652

Customer Name: Masdom LTD

			(Ircc)	
Model Number: 831	Size: 1"	Quantity: 8	Material Specification: ASTM A352-18 LCC(

HARDNES S (RB unless noted)	08	79	79
%RA	74	70	71.7
%ELO 2"	25	27	27.2
YIELD	54270	52937	50671
TENSILE PSI	81002	77629	77277
CP		0	
>	0.0027	0.0023	0.0021
Cu	0.0443	0.0327	0.0266
Mo	0.0134	0.0052	0.0114
Z	0.0341	0.0216	0.0326
Ď	0.1313	0.0273	0.1055
Si	0.2577		0.2961
œ	0.0128	0.0115	0,002
Δ.	0.0109	0.0139	0.0111
Mn	1.3639	1.314	1.3624
	0.1965	0.2085	0.1848
Heat Code	AX	KW	LW

Charpy Impact Test: Conducted in accordance with ASTM A370 Sections 19 Through 20. Standard full size test specimen.

Test 2 Test 3			
Test 1	32.95	22.8	20
Average of 3 Test	36.52	22.8667	25.6
Heat Code	AX	KW	ΓW
Fest Temperature: -50F			

TESTING PROCEDURE: All Apollo Valves are 100% tested in accordance with their standard of construction. Valves designed to the requirements of ASME B16.34 are tested to meet or exceed the requirements of API 598, ASME B16.34, MSS SP-61 and MSS SP-72. Valves designed to the requirements of MSS SP-110, are tested to meet or exceed the requirements of MSS SP-110. Specification sheets are available at www.apollovalves.com.

We certify that the above listed components meet the requirements of the procurement documents as stated.	This material certificate complies with EN 10204-2004 Type 3.1 (formerly Type F3.1.B).

Signed: Date:

The above listed information is certified to be true and accurate to the best of my knowledge and belief.

Steve Causey
Steve Causey
Quality Assurance Manager





Certificate of Compliance (QC-02)

FARRIS ENGINEERING DIV. OF CURTISS-WRIGHT FCC 10195 BRECKSVILLE RD BRECKSVILLE OH 44141 UNITED STATES

Date: 07/10/2019

Sales Order No.: 1SL047059

Customer:

Customer Order No.: 00026111

CRN No.: CSA-0G11969.5CL

MLTS_6056-18735 Cert# PRV FARRIS

Line Tag Number	Model Number	Serial Number
1	27EA34-M20	942333-1-KE
1	27EA34-M20	942333-2-KE
1	27EA34-M20	942333-3-KE
1 İ	27EA34-M20	942333-4-KE

We hereby certify that the valve(s) indicated above have been designed, manufactured and tested in accordance with ASME Section VIII, Division 1 by Curtiss-Wright Flow Control Corp. - Farris Engineering in accordance with the company's Quality Control Program. The Brecksville Facility's Quality Control Program is registered to ISO 9001:2015, Certificate Identity No. 10076249. We hereby certify that they were produced in conformance with the contract and Farris Worldwide Quality Manual Revision N, dated 13-Sep-18.

The representative signing the document states that the above information is correct and true.

Anthony Korinek

Certified Individual

Date: 07/10/2019



Material Test Reports (QC-04)

FARRIS ENGINEERING DIV. OF CURTISS-WRIGHT FCC 10195 BRECKSVILLE RD BRECKSVILLE OH 44141 UNITED STATES

Sales Order No.: 1SL047059

Line No.: 1

Qty: 4

Customer:

Customer Order No.: 00026111

Model No.: 27EA34-M20

Serial No.: 942333-1-KE, 942333-2-KE, 942333-3-KE, 942333-4-KE

Tag No.:

Serial No.	Component		Item Number	Lot Number	Material Description
942333-1-KE	BODY 1 X 1/2 MNPT	2700	325737X1-010	872-0118	ASME SA-479 316SS
942333-1-KE	DISC	2700	325742-010	900758	ASME SA-479 316SS
942333-1-KE	BONNET	2700	326076X2-023	640G	ASME SA-216 WCB
942333-2-KE	BODY 1 X 1/2 MNPT	2700	325737X1-010	872-0118	ASME SA-479 316SS
942333-2-KE	DISC	2700	325742-010	900758	ASME SA-479 316SS
942333-2-KE	BONNET	2700	326076X2-023	640G	ASME SA-216 WCB
942333-3-KE	BODY 1 X 1/2 MNPT	2700	325737X1-010	872-0118	ASME SA-479 316SS
942333-3-KE	DISC	2700	325742-010	900758	ASME SA-479 316SS
942333-3-KE	BONNET	2700	326076X2-023	640G	ASME SA-216 WCB
942333-4-KE	BODY 1 X 1/2 MNPT	2700	325737X1-010	872-0118	ASME SA-479 316SS
942333-4-KE	DISC	2700	325742-010	900758	ASME SA-479 316SS
942333-4-KE	BONNET	2700	326076X2-023	640G	ASME SA-216 WCB

Note: Traceability of individual parts to their NDE and special process reports is maintained through Lot Codes created by serializing the lot number shown on the material manufacturer's Material Test Report.

产品质量证明书 INSPECTION CERTIFICATE EN10204 3.

178868

Add: Lukouqiao Zhouzhuang Town JiangYin JiangSu China

地址,中国江苏省江阴市周庄镇路口桥

STAINLESS STEEL MATERIAL FACTORY

编号: 20180901 Serial number: FAX:(0510)86905200 光亮Bright The delivery 交货状态 status 10.00-14.00 10,14 10.14 10.2 O Z 10, 10. 2.00-3.00 硬度 Hardness阳≤ 2. 07 2. 05 2. 05 2. 07 2. 07 2. 07 Mo CONTRACT NO: 7969 162 163 164 62 161 6.00-18.00 16.64 16.52 16.52 . 合同号: 16.52 16.64 ö TEL:(0510)86236681 Average平 0.025 0.025 ≤0.030 0.05 0.02 0.025 FARRIS ENGINEERING charpy 8 S QUALITY CONTRO 均功 SA479 2015 2018-11-30 冲击试验Impact 41 Individual单个 QC 04 0.034 0.034 0.034 0.034 0.034 ≤0.045 Chemical Composition Individual Kv2(J) ≥ STANDARDS: 1.76 1.74 1.76 ₹2.00 1.74 1,76 ASME Mn BY Properties Reduction of Area ≤1.00 0.4 0.4 0.4 Si 新面收缩率 Z (%)≥40 0 80 76 79 故行标准: EXECUTIVE 化学成分 0.026 0.026 ≤0.030 0.03 0.03 0.03 Mechanical 并格实物保管好 A (%)≥30 Elongation 年大路 重量 Weight 1075 2176 1093 1120 984 机椒性能: 58 55 55 (kg) 57 发货日期、原因, Yield Strength Rp0.2(Mpa) 屈服强度 ≥205 文 数 Bundles 310 314 312 312 311 18 15 6 0 Control CO.,LTD Rm (Mpa)≥ 872-0118 872-0118 872-0118 872-0117 872-0117 抗拉强度 来函贷标明钢号、炉号、规格、 Heat No. Tensile Strength 冶炼炉号 592 595 590 515 587 590 Curtisswrigh (Tian jin) Flow Solution treatme treatment condition 热处理状态Heat 固溶处理 ф50.8 ф50.8 Ф 78 Ф72 Ф 72 规格 Size 成飞机械 说明: 1.有异议时, 316/316L 316/316L 热处理炉号 316/316L 180315-1 316/316L 316/316L treatment 180407-1 180407-1 furnace 180326-180326-Grade Heat 柳号 110 收货单位: SOLD TO: SN. 世中 2 世中

Heat treatment:Solution treatment :1900TF, 1hours minimum, rapidly cooled to below 90TF. 备注:

(1) When there is any complain, you are kindly requested to mark the Steel Grade, Heat No., Size, Delivery Date, Causes and reserve the materials in the condition

Notes:

质量 0

examime and verify

十五粒

Principal

出炉急冷到32°C以下

热处理; 固溶处理; 1040℃最少1小时保温,

2018/9/10

Issued Date 签发日期:

Stamp of Department of Quality

提供的材料符合NACE MR0103 and

MR0175/ISO 15156,

MR0175/IS015156标准单寸

市不锈筋

material supplied meets the requirements

The Jo

the current versions of NACE MR0103 and

Assurance 人

福建省明溪县长虹精密铸钢有限公司 Fujian Mingxi Changhong Precision Steel Casting Co., Ltd.

Address: Pingpu industrial Park Mingxi county, Fujian, China. Tel:0598-2866208, Fax:0598-2867736

材料质量证明书

Material Inspection EN 10204 3.1

10204 3.1

Customer: Curtiss-wright Flow Control Farris Engneering

Address: No. 3 Quanhui Road, Wuqing Development Area, Tianjin China. Tel:86-22-82166100, Fax:86-22-82166160

					CHH	IZ	证书编号	Cert. No.:		201901	085
	j ^{tr} i	品名称	零件	牛号	执行	标准	材质	数量	炉号	-	订单号
No.	Pr	oduct	Part	No.	Produc	t Std.	Material	Quantity	Heat No.	01	der No.
1	Bonnet		326076X2	-023	ASME SA	216-2015	WCB	12	637G	6PR0024	The same of the sa
2	Bonnet		326076X2	-023	ASME SA	216-2015	WCB	10	638G	6PR0024	
3	Bonnet,		326076X2	-023	ASME SA	216-2015	WCB	10	639G	6PR0024	
4	Bonnet		326076X2	-023	ASME SA	216-2015	WCB	25	640G	6PR0024	78
5	Bonnet		326076X2	-023	ASME SA	216-2015	WCB	22	641G	6PR0024	
6	Bonnet		326076X2	-023	ASME SA	216-2015	WCB	17	642G	6PR0024	
7	Bonnet		326076X2	-023	ASME SA	216-2015	WCB	20	752G	6PR0024	
				化学成分	Chemic	al Compo	sitions		-		
Spec.	С	Si	Mn	P	S	Cr	Ni	Мо	Cu	V	N
示准值	≤0.3√	≤0.6√	≤1.0	/≤0.04	<0.045	/≤0.50		≤0.2	≤0.3 √	€0.03	-
637G	0. 222	0. 197	0.772	0.017	0.007	0.071	0. 024	0.004	0.011	0.001	
638G	0. 213	0.210	0.703	0. 020	0.008	0.071	0.017	0.002	0.010	0.002	
639G	0. 215	0. 212	0. 703	0.020	0.008	0.071	0.017	0.002	0.010	0.001	
640G	0. 261	0. 204	0. 672	0.022	0.008	0.099	0.026	0.003	0.011	0.002	
641G	0. 212	0. 230	0. 675	0.018	0.006	0.096	0. 030	0.003	0. 011	0.002	
642G	0. 212	0. 229	0. 677	0.019	0.006	0.096	0.029	0.003	0. 011	0.002	
752G	0. 220	0. 218	0. 689	0.021	0.006	0.057	0. 030	0.004	0.011	0.002	
	抗拉强度	屈服强度	延伸率		女缩率			冲击功			石田市
_	Tensile	/出版短短/受 Yieid	Elongation		Ction		Chamai	Impact Tes	- (T)		硬度
Conn	Strength	Strength	Elongation		Area	-	Charpy	Impact les	st (J)		Hardness
Spec.	(MPa)	/ (MPa)	%		%	Temp. ℃	Average	-	Individua	1	НВ
示准值	485-655 V	>250 V	≥22 \	/ ≥35√	P	-29	The same of the same of		≥19	≥19	S237 V
637G	550	360	37	60		23	655	12.123	>19	219	159
638G	553	350	36	62			130		27		159
639G	555	363	36	60			1/5/10	TO FR	e 1		157
640G	546	357	38	59			The (427)	0//3/19/	11.		156
641G	549	352	37	61			1201	~ 1, 13, 1, 1,	1. 1/		156
642G	549	348	36	60			11 3		7		153
752G	537	361	35	63			133	11			158
1020	551	301	00	热处	理 Hea	t Treatm	ent	-			100
序号	热处理炉号	浇注炉号	入炉时间	入炉温度℃	到温时间	到温温度で	出炉时间	出炉温度℃	保温田	时间 H	冷却方式
No.	Heat Lot.	Heat No.	Charging time	Charging Temp.	Start Time	Hold Temp.	Finished Time	Finish Temp.	Soak ti	ime (H)	Cooling
1	181030-1	637G	7:25	413	9:20	905	11:20	907	2:00	Y	Air空气
2	181030-1	638G	7:25	413	9:20	905	11:20	907	2:00		Air空气
3	181030-1	639G	7:25	413	9:20	905	11:20	907	2:00		Air空气
4	181108-1	640G	7:16	520	9:00	902	11:00	906	2:00		Air空气
5	181106-1	641G	8:00	368	10:00	901	12:00	905	2:00		Air空气
6	181106-1	642G	8:00	368	10:00	901	12:00	905	2:00		Air空气
7	180830-1	752G	7:25	425	9:20	908	11:20	910	2:00		Air空气
	100000 1	1040	1.20	其他信		Informa		010	2.00		1111111
序号	外观	尺寸检查	无	损探伤 N				交	货状态		
		Dimension	MT/PT	UT	1						
No.	115ual 0	r DIMCHSION	MII/II	UI	RT			Deliver	y Condit	lon	

^{1.} We hereby certify that the materials described herein have been manufactured, inspected and tested in accordance with the customer's specification(s), and that they satisfy the requirements APPROVI2. All of casting visual inspection according to MSS-SP-55.

3. The material supplied meets the requirments of the current version of NACE MR0103 and MR0175/ISO 15156.

编 制 Prepared By: 谢海荣 2019-1-25 审 批 Approved By: 2019-11-30 易娟 2019-1-25 ARRIS ENGINEERING QUALITY CONTROL BY QC 03

MILL TEST CERTIFICATE

Basauri Plant

ISO 9001; ISO-TS 16949; ISO 14001 Y OHSAS 18001





APPROVED

BY № 1005557

+14 7722

NOV. 1 4 2018



Product Made in Spain

CUSTOMER: MAGELLAN CORPORATION		WORKS REFERENCE: 1910594
REFERENCE: 211222	SALES ORDER: 299090-2	HEAT NUMBER: 900758
PRODUCT NR:	MASTER REFERENCE: 215719	ROLLED: 04.01.2017

REQUIRED PRODUCT AISI316/316L ROUND BARS TURNED SOLUTION ANNEALED 0.8750" SPECIFICATION'S TOLERANCE 12'-12'2" NORMAL EXPEDITION DELIVERY: 0080571873 WEIGHT (KG):4.614 BUNDLES:6

MADE ACCORDING TO

AISI STAINLESS STEELS - 01.03.1999; ASME SA182-SA182M SECTION II, PART A - 2015

ASTM A193-A193M 2015 01.06.2015; ASTM A276/A276M 15 01.01.2015; ASTM A314 2015 15.07.2015

ASTM A320-A320M 2015 01.05.2015; ASTM A370 2014 15.05.2014; ASTM A473 13 01.11.2013

ASTM A479-A479M 2015 15.07.2015; ASTM A484-A484M 15 01.03.2015; ASTM A751 2014 01.03.2014

EN 10204 : 2004 OCT. 2004 3.1; MAGELLAN MIC 1751 AMD12.3 21.12.2016

MAGELLAN MIC 1751 SUPP AISI316/AISI316L - 24.06.2015; NACE MR0103-2005 - 2005

NACE MR0175/ISO 15156-1 3* EDICION 23.11.2015; NACE MR0175/ISO 15156-3 3* EDICION 23.11.2015

SAE AMS 5648 L . .09.2012; SAE AMS 5653 H .. 11.2012; SAE AMS-QQ-S-763 D 03.2015

CHE	MICAL AN	TALYSIS	OF HEA	T					∇:%	HEAT	NUMBER: 9	00758
	C	Mn	Si	P	8	Cr	Ni	Mo	V	W	Co	
Min.		1,250			0,020	16,500	10,000	2,000				
Max.	0,030	2,000	0,750	0,040	0,030	18,000	13,000	2,500	0,100	0,100	0,3000	
Cer.	0,015	1,490	0,488	0,026	0,025	16,700	10,120	2,030	0,060	0,082	0,2280	
	Cu	Al	Ti	Nb	N							
Min.												
Max.	0,750	0,100	0,1000	0,1000	0,1000							
Cer.	0,337	0,006	0,0050	0,0160	0,0730							

INCLUSIONS (MICROINCLUSIONS)

Standard(ASTM E45 2013 . . . 2013); Type/method(A); A(t):2,5; A(h):1; B(t):0,5; B(h):0,5; C(t):1,5 C(h):1; D(t):0,5; D(h):0,5

MECHANICAL PROPERTIES AS SUPPLIED (TEST)

Sample: Supply section (bar prolongation); Specimen Test location: Nucleus

Standard(1) (ASTM A370 2014 15.05.2014); Standard(2) (ASTM E8/E8M 2015A 15.05.2015)

Tensile direction:Longitudinal; Tensile test Temp. (Room temperature):Room temperature

Ts(83.000/120.000PSI):89.605PSI; Ys(0,2% >=30.000PSI):0,2% 44.089PSI; E1.(2" >=40%):2" 57,2%

Z(>=50%):74,9%; Standard(ASTM E23 07-AE1 2007)

Notch impact direction:Longitudinal; Notch Impact sample type(CHARPY-V):CHARPY-V

Notch Impact Temp.(68°F):68°F; K(1):203Ft.Lb; K(2):206Ft.Lb; K(3):205Ft.Lb; K (average):204,67

K (single) (>=75Ft.Lb):203Ft.Lb; Hardness Standard(1) (ASTM A370 2014 15.05.2014)

Hardness Standard (2) (ASTM E10 2015 01.05.2015)

Surface hardness (of the bar 140/223HB) tof the bar 209HB

Hardness at(at 1/2 radius of the bar 140/223HB):at 1/2 radius of the bar 162HB

ADDITIONAL TESTS

Standard(ASTM A262 - 01.07.2014); Type / Method(Practice E):Practice E

Standard(ASTM E112 2013 01.10.2013); Grain size: Austenitic 6; Standard(ASTM E381 2001 R2006)

macroetching(1):S 1; macroetching(2):R 1; macroetching(3):C 1; Intercrystalline Corrosion:O.K.

TECHNOLOGY & QUALITY CERTIFIES THAT THE PRODUCT FULL FILLS THE ORDER

APPROVED BY: ALBERTO CUBERO ZABALA

DATE:21.02.2017 REF.:1002484420000 Page 1 of 2

SIGN: Analyst at DValky

MILL TEST CERTIFICATE

Basauri Plant

ISO 9001; ISO-TS 16949; ISO 14001 Y OHSAS 18001



Product Made in Spain

CUSTOMER: MAGELLAN CORPORATION		WORKS REFERENCE: 1910594
REFERENCE: 211222	SALES ORDER: 299090-2	HEAT NUMBER: 900758
PRODUCT NR:	MASTER REFERENCE: 215719	ROLLED: 04.01.2017

NON DESTRUCTIVE TESTS

U.T. standard(1)(ASTM A388-A388M 2015 15.07.2015); U.T. type/method(1)(FBH)

U.T. standard(2)(API SPEC 6A 20*ED.+ER1&2+AD12.3 . .03.2013); U.T. type/method(2)(PSL3)

U.T. standard (3) (ISO 10423

4*ED.2009 15.12.2009); U.T. type/method(3)(PSL3)

ULTRASONIC INSPECTION 100%: O.K. (1) =<1,5 mm.(according to Suplem.1 ASTM A388)

ULTRASONIC INSPECTION 100%: O.K. (2) according to: API 6A/ISO-10423 "PSL3"

ULTRASONIC INSPECTION 100% : O.K. (3); CRACKS CONTROL 100% : O.K.

ADDITIONAL INFORMATION

Reduction ratio:49,7; "Macrostructure: Satisfactory"

Ultrasonic Inspection Results ("ASTM A388: Satisfactory"); DFARS Compliant

HEAT MELTED AT OUTOKUMPU (UK) AND PROCESSED AT SIDENOR (SPAIN); RoHs Compliant

Material Cold Finished, Peeled and Reeled; CONTINUOUS CASTING 150 X 150 mm.

SOLUTION ANNEALED at 1922 F - IN AIR; .; .

Material manufactured through the Electric Arc Furnace and AOD.

Steel not exposed to Mercury, or to any other metal alloy that is liquid, at ambient temperatures during processing or while in Sidenor's possession.

Steel is free from Uranium or any other harmful radioactive contamination.

Steel products were not repaired by welding.

100% anti mix test performed by spectrometry.

APPROVED FARRIS ENGINEERING - QUALITY CONTROL

NOV 1 4 2018

BY_ # 1005557

+JN7722

TECHNOLOGY & QUALITY CERTIFIES THAT THE PRODUCT FULL FILLS THE ORDER

APPROVED BY: ALBERTO CUBERO ZABALA

Page 2 of 2

SIGN:

Analyst of QV

DATE:21.02.2017 REF.:1002434420000



PICK TICKET

MAS Edmonton Branch 1315473

§ EMCO LTD WESTLUND (261) ROUYN-NORANDA PO BOX 5300 STN A

WESTLUND

LONDON, ON N6A 4N7

CANADA

Ordered By: Chantal Gregoire



MTR	's WHE	N APPLICA	ABLE
PICKED BY:	27/	CHECKED	BY:
103449	1	03449	1 of 1
SHIP TO NO	CUST	OMER NO	PAGE
8/20/2019	13	315473	1452662
PICK DATE	PIC	KTICKET	ORDER NUMBER

ABF MINES CANADA INC. (2985080)

1310 AVE DAVY

TROUYN-NORANDA, QC J9Y 0A8 CANADA

ORDER DATE	CUSTOMER PO / ORDER NUMBER		CARRIER	TAN	KER
8/20/2019	DO2610173-00		Purolator	AND	REN
De	livery / Quick Notes	QTY	Item	Box ID	Skid ID
Delivery Instruction	s: EX: EDMONTON / PUROLATOR # 7	334590			
B /	8 FF	4 EA	014-53208 MAS LSSF3-HDFS-N 1 3000WOG FP LCC IP 3PC FS NA	CE BALL	
# 18F	F 185 F 6	(1) (5A)	014-53214 MAS LSSF3-HDFS-N 2 2000WOG FP LCC IP 3PC FS NA	CE BALL	
Total Lines: 2 Total Pieces: 5 Total Weight: 3			Total Skids / Boxes:	Shipment Weight:	

JY VALVE & MFG. CO., LTD.

(Qianguo Village, Huangtang Town) Chengxi Taiwanese Business Base Huian County, Quanzhou, Fujian, China 362101

TEL: (0595) 2730-1335 FAX: (0595) 2730-1336

MESSRS.:

M. A. STEWART & SONS LTD.

DELIVER TO: VANCOUVER

SHEET NO.: LSSF3HDFSN-F181206-1

P.O. NO.

#1011686

DATE : DEC. 26, 2018

CERTIFICATE OF COMPLIANCE

WE, JY VALVE & MFG. CO., LTD. HEREBY CERTIFY THAT OUR PRODUCTS AS SHOWN ON DRAWINGS OF OUR MODEL LSSF3-HDFS-N ARE MANUFACTURED, INSPECTED AND TESTED FULLY IN ACCORDANCE WITH THE FOLLOWING STANDARDS:

PDECCUPE TEMPERATURE	1/4" TO 1"	3000 PSIG @100°F
PRESSURE-TEMPERATURE RATING	1-1/4" TO 2"	2000 PSIG @100°F
RATING	2-1/2" TO 3"	1000 PSIG @100°F
BODY & CAP	ASTM A352-LCC	
SEAT MATERIAL	R-PTFE	
VALVE TESTING	API 598 Ж	
FIRE TEST STANDARD	API 607 5TH EDITION	
END CONNECTION	NPT THREADS TO AN	ISI B1.20.1

[×] HIGH PRESSURE SHELL TEST AND LOW PRESSURE SEAT TEST ARE PERFORMED 100%.

NACE MR-0175-2002 AND MR-0103 COMPLIANCE

JY VALVE & MFG. CO., LTD.

CHARLES CHAN, PRESIDENT

JY VALVE & MFG. CO., LTD.

(Qianguo Village, Huangtang Town)Chengxi Taiwanese Business Base Huian County, Quanzhou, Fujian, China 362101

Tel: 86-595-27301335

Fax: 86-595-27301336

INSPECTION CERTIFICATE

MESSRS.: M. A. STEWART & SONS LTD.

O : VANCOUVER

P.O. NO.:: #1011686

SHEET NO. : LSSF3HDFSN-F181206-2

EXPORT NO.: F181206

DATE : <u>DEC. 26, 2018</u>

Tagon Swang

JASON HUANG, QC MANAGER

WITNESSED BY: JY VALVE & MFG. CO., LTD.		
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VITNESSED BY: JY VALVE	O.	0
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DESCRIPTION 3000/2000/1000 WOG CARBON STEEL 3-PIECE TYPE INVESTMENT CAST BALL /ALVES (NACE-	SIZE O'TY PRESSURE TEST (PSIG)	(INICIA) (DCC)	(INCH) (FCS) HYDRO HYDRO AIR NESOLI	1" 18 4500 80 GOOD GOOD GOOD GOOD GOOD	NO	ECE				'CE-	
" m > 0 >		DESCRIPTION		3000/2000/100	WOG CARBON	STEEL 3-PIECE	TYPF	INVESTMEN	CAST BALL	VALVES (NACE-	MR-0175)

MATERIAL TEST RESULTS

: M. A. STEWART & SONS LTD. MESSRS.

: VANCOUVER

: #1011686 P.O. NO.

VALVE MODEL : LSSF3-HDFS-N

REVIEWED BY

SHEET NO. : LSSF3HDFSN-F181206-3 EXPORT NO : F181206

: DEC. 26, 2018

DATE

MATERIAL: ASTM-A352 GRADE LCC : QUAN ZHOU JING YING VALVE CO., LTD. 3000/2000/1000 WOG BALL VALVE

SIZE : 1"

JASON HUANG, QC MANAGER JY VALVE & MFG. CO., LTD.

				CHEN	AICAL RE	CHEMICAL REQUIREMENT (%)	(%) LNE					
ELEMENT	MENT	O	Si	Mn	Ь	S	ï	Ö	Mo	>		
SPEC (MAX.)	(MAX.)	0.250	0.600	1.200	0.040	0.045	0.500	0.500	0.200	0.030		
Production No	Parts Name		B For ear	ch reduction of 0.01	1% below the specif	ed maximum carbo	n content, an incre	ase of 0.04% Mn ab	ove the specified m	naximum will be perm	B For each reduction of 0.01% below the specified maximum carbon content, an increase of 0.04% Mn above the specified maximum will be permitted up to a maximum of 1.28%	1 of 1,28%
18FF	BODY & CAP	0.2010	0.4400	0.6900	0.0150	0.0048	0.3230	0.4000	0.0740	0.0120		
TENSILE REC	TENSILE REQUIREMENTS	Tensile (M	Tensile Stength (MPa)	Yield S (M)	Yield Strength (MPa)	Elongal	Elongation (%)	Reductio (%	Reduction of area (%)	Hardne	Hardness (HB)	Charpy V-Notch Energy value
Production No	Parts Name	485	485 - 655	Min.	Min. 275	Min	Min. 22	Min	Min. 35	May	Max. 187	Min. 20
18FF	BODY & CAP	25.	524	28	288	3	36	4	45		160	52
Heat treatment	NORMALIZED @890 DEGREE C - 1H	890 DEGR	EE C - 1H	AIR COC	DLING AN	AIR COOLING AND TEMPERED	RED					

WE HEREBY CERTIFY THAT THE MATERIAL HEREIN DESCRIED ARE SATSIFACTORY IN ACCORDANCE WITH THE SPECIFICAITON.

MATERIAL TEST RESULTS

SHEET NO. : LSSF3HDFSN-F181206-4

EXPORT NO : F181206

: DEC. 26, 2018

DATE

: M. A. STEWART & SONS LTD. MESSRS.

: VANCOUVER

: #1011686 P.O. NO. : LSSF3-HDFS-N

VALVE MODEL

REVIEWED BY

SIZE : 1"

MATERIAL: ASTM-A351 GRADE CF8M : FUZHOU SHI GANG VALVE MANUFACTURE CO.,LTD 3000/2000/1000 WOG BALL VALVE

JASON HUANG, QC MANAGER Regen & ways

JY VALVE & MFG. CO., LTD.

-1			_	_		_		_		_		_	_	~
OI VALVE A MIL O. OO., LID.		Mo	000	2.0-2.0	2.0700				ss (HB)	187	165			
		ï	180 210 0 0 120 20 20 20 20 20 20 20 20 20 20 20 20 2	3.0-12.0					Hardness (HB)	Max. 187	16			
		Ċ	10 0 04 0	10.0-21.0	0.0383 18.0900 9.0400				Elongation (%)	. 30	5			
	(%) II	Ь	0700		0.0383				Elongat	Min. 30	35			
	CHEMICAL REQUIREMENT (%)	S	0700	0.040	0.0083				Yield Strength (MPa)	Min. 205	225			
	CAL REQ	Si	4 500	000.1	0.5090				Yield S (MI	Min.	22			
	CHEMI	Mn	1 500	000:1	0.7900				Tensile Stength (MPa)	Min.485	515			
		O	0000	0.000	0.0510				Tensile (MI	Min	5.			
		IENT	MAX.)	Parts Name	BALL				UIREMENTS	Parts Name	BALL			
		ELEMENT	SPEC (MAX.)	Production No	B-1118				TENSILE REQUIREMENTS	Production No	B-1118			

WE HEREBY CERTIFY THAT THE MATERIAL HEREIN DESCRIED ARE SATSIFACTORY IN ACCORDANCE WITH THE SPECIFICAITON.

SOLUTION TREATMENT: @1080 DEGREE C - 1H WATER QUENCHING

Heat treatment

MATERIAL TEST RESULTS

SHEET NO.: LSSF3HDFSN-F181206-5

EXPORT NO : F181206

: DEC. 26, 2018

DATE

: M. A. STEWART & SONS LTD. MESSRS.

: VANCOUVER 2

: #1011686 P.O. NO. SIZE : 1"

: LSSF3-HDFS-N

VALVE MODEL

REVIEWED BY

MATERIAL: ASTM-A276 TYPE 316

: GAOYOU WEI DA STAINLESS STEEL CO., LTD. 3000/2000/1000 WOG BALL VALVE

JASON HUANG, QC MANAGER IY VAI VE & MFG CO I TD

									HOT-FINISHED	Heat treatment
166	53	5	48	4	218	2.	518	5	STEM	S-1118
Max. 187	Min. 50	Min	Min. 40	Min	Min. 205	Min.	Min. 515	Min.	Parts Name	Production No
Hardness (HB)	Reduction of area (%)	Reductio (%	Elongation (%)	Elonga	Yield Strength (MPa)	Yield S	Tensile Stength (MPa)	Tensile (M	TENSILE REQUIREMENTS	TENSILE REC
	2.0800	10.8000	16.6200 10.8000 2.0800	0.6500	0.0210	0.0020	0.9800	0.0780	STEM	S-1118
	2.00-2.00	0.4.0	0.01	000.1	0.000	0.0	2.000	0.000	Parts Name	Production No
	2 00 3 00	10 0 14 0	16 0 18 0 10 0 14 0 2 00 3 00	1 000	0.030	0.045	0000	0800	SPEC (MAX.)	SPEC
	Mo	ï	Cr	Si	S	Ь	Mn	O	ELEMENT	NELEN
				(%) IN	UIREME	CHEMICAL REQUIREMENT (%)	CHEMI			
JY VALVE & MIFG. CO., LID.	ALVE & IVII	JYV								

WE HEREBY CERTIFY THAT THE MATERIAL HEREIN DESCRIED ARE SATSIFACTORY IN ACCORDANCE WITH THE SPECIFICAITON.

JY VALVE & MFG. CO., LTD.

(Qianguo Village, Huangtang Town) Chengxi Taiwanese Business Base Huian County, Quanzhou, Fujian, China 362101 TEL: (0595) 2730-1335 FAX: (0595) 2730-1336

MESSRS .:

M. A. STEWART & SONS LTD.

DELIVER TO: VANCOUVER

SHEET NO.: LSSF3HDFSN-F190403-1

P.O. NO.

#1011686

DATE : APR. 24, 2019

CERTIFICATE OF COMPLIANCE

WE, JY VALVE & MFG. CO., LTD. HEREBY CERTIFY THAT OUR PRODUCTS AS SHOWN ON DRAWINGS OF OUR MODEL LSSF3-HDFS-N ARE MANUFACTURED, INSPECTED AND TESTED FULLY IN ACCORDANCE WITH THE FOLLOWING STANDARDS:

1/4" TO 1"	3000 PSIG @100°F
1-1/4" TO 2"	2000 PSIG @100°F
2-1/2" TO 3"	1000 PSIG @100°F
ASTM A352-LCC	
R-PTFE	
API 598 Ж	
API 607 5TH EDITION	
NPT THREADS TO AN	ISI B1.20.1
	1-1/4" TO 2" 2-1/2" TO 3" ASTM A352-LCC R-PTFE API 598 API 607 5TH EDITION

[×] HIGH PRESSURE SHELL TEST AND LOW PRESSURE SEAT TEST ARE PERFORMED 100%.

NACE MR-0175-2002 AND MR-0103 COMPLIANCE

JY VALVE & MFG. CO., LTD.

CHARLES CHAN, PRESIDENT

JY VALVE & MFG. CO., LTD.

(Qianguo Village, Huangtang Town)Chengxi Taiwanese Business Base Huian County, Quanzhou, Fujian, China 362101

Tel: 86-595-27301335

Fax: 86-595-27301336

INSPECTION CERTIFICATE

MESSRS.: M. A. STEWART & SONS LTD.

O : VANCOUVER

P.O. NO.:: #1011686

SHEET NO. : LSSF3HDFSN-F190403-2

EXPORT NO.: <u>F190403</u>

DATE : APR. 24, 2019

Tayon & wang

JASON HUANG, QC MANAGER

WITNESSED BY: JY VALVE & MFG. CO., LTD.

	DESTILE MATERIAL DIMENSION VISUAL OPERATION		GOOD						
	VISUAL		GOOD						
	DIMENSION		GOOD						
	MATERIAL		GOOD						
PSIG)	T II I J	NESULI	GOOD						
EST (AIR	80						
PRESSURE TEST (PSIG)	SEAT	HYDRO							
PRES	SHELL	HYDRO HYDRO AIR	3000						
SIZE O'TV	NOTE AND AND AND AND AND AND AND AND AND AND	(201)	20						
SIZE	INCL)	(IIVCII)	2"						
	DESCRIPTION		3000/2000/1000	WOG CARBON	STEEL 3-PIECE	TYPE	CAST BALL	VALVES (NACE-	MR-0175)
VALVE	MODEL	MODEL				LSSF3-HDFS-N			

MATERIAL TEST RESULTS

MESSRS. : M. A. STEWART & SONS LTD.

SHEET NO. : LSSF3HDFSN-F190403-3

EXPORT NO : F190403

: APR. 24, 2019

DATE

: VANCOUVER

P.O. NO. : #1011686

VALVE MODEL : LSSF3-HDFS-N
3000/2000/1000 WOG BALL VALVE
MATERIAL: AS

REVIEWED BY : QUAN ZHOU JING YING VALVE CO., LTD.

MATERIAL: ASTM-A352 GRADE LCC

JASON HUANG, QC MANAGER

JASON HUANG, QC MANAGER
JY VALVE & MFG. CO., LTD.

								otch Je				T	
								Charpy V-Notch Energy value	Min. 20	52	52		
				um of 1.28%				Cha					
				ted up to a maximu				Hardness (HB)	Max. 187	160	160		
01 VIEVE & MI C. CC., LID.		>	0.030	imum will be permi	0.0120	0.0120		Hardne	Max	_			
1 2 1 2		Mo	0.200	the specified max	0.0740	0.0740		n of area (α	35	10	10		
	*	ప	0.500	B For each reduction of 0.01% below the specified maximum carbon content, an increase of 0.04% Mn above the specified maximum will be permitted up to a maximum of 1.28%	0.4000	0.4000		Reduction of area (%)	Min. 35	45	45		
	(%) LN	Ë	0.500	content, an increase	0.0048 0.3230	0.3230		Elongation (%)	Min. 22	36	9		RED
	UIREME	S	0.045	d maximum carbon	0.0048	0.0048		Elongat	Min	3	36		O TEMPE
	CHEMICAL REQUIREMENT (%)	Ь	0.040	below the specifie	0.0150	0.0150		trength	Min. 275	88	00		AIR COOLING AND TEMPERED
	CHEM	Mn	1.200	reduction of 0.01%	0.6900	0.69.0		Yield Strength (MPa)	Min.	288	288		
		Si	0.600	B For each	0.4400	0.4400		Stength	655	74	54		EE C - 1H
		ပ	0.250		0.2010	0.2010		Tensile Stength (MPa)	485 - 655	524	524		90 DEGR
		ENT	MAX.)	Parts Name	BODY	CAP		UIREMENTS	Parts Name	BODY	CAP		NORMALIZED @890 DEGREE C - 1H
		ELEMENT	SPEC (MAX.)	Production No	18FF	18JF		TENSILE REQUIREMENTS	Production No	18FF	18JF		Heat treatment

WE HEREBY CERTIFY THAT THE MATERIAL HEREIN DESCRIED ARE SATSIFACTORY IN ACCORDANCE WITH THE SPECIFICAITON.

MATERIAL TEST RESULTS

: M. A. STEWART & SONS LTD. MESSRS.

: VANCOUVER

: #1011686 P.O. NO. SIZE : 2"

: LSSF3-HDFS-N

VALVE MODEL

MATERIAL: ASTM-A351 GRADE CF8M

: APR. 24, 2019

: LSSF3HDFSN-F190403-4

SHEET NO.

EXPORT NO: F190403

DATE

JASON HUANG, QC MANAGER

REVIEWED BY : FUZHOU SHI GANG VALVE MANUFACTURE CO.,LTD 3000/2000/1000 WOG BALL VALVE

JY VALVE & MFG. CO., LTD.

			CHEM	CHEMICAL REQUIREMENT (%)	UIREME	(%) LN				
ELEMENT	IENT	0	Mn	Si	S	۵	Ċ	Z	Mo	
SPEC (MAX.)	(MAX.)	0000	4 500	4	070	070	000	0 400	0	
Production No	Parts Name	000.0	006.1	000:1	0.040	0.040	10.0-2-1.0	3.0-12.0	Z.U-3.U	
B-0319	BALL	0.0503	0.6880	0.4740	0.0065	-	0.0378 18.3200	9.1600	2.0500	
SILE REC	TENSILE REQUIREMENTS	Tensile (M	Tensile Stength (MPa)	Yield S (M	Yield Strength (MPa)	Elonga	Elongation (%)	Hardne	Hardness (HB)	
Production No	Parts Name	Min	Min.485	Min.	Min. 205	Min	Min. 30	Max	Max. 187	
B-0319	BALL	5	545	2.	245	4	47	1	140	
Heat treatment	SOLUTION TREATMENT:		01080 DE	GREE C -	1H WATE	@1080 DEGREE C - 1H WATER QUENCHING	CHING			

WE HEREBY CERTIFY THAT THE MATERIAL HEREIN DESCRIED ARE SATSIFACTORY IN ACCORDANCE WITH THE SPECIFICAITON.

MATERIAL TEST RESULTS

: M. A. STEWART & SONS LTD. MESSRS.

: VANCOUVER

: #1011686 P.O. NO. SIZE : 2"

REVIEWED BY : GAOYOU WEI DA STAINLESS STEEL CO., LTD.

3000/2000/1000 WOG BALL VALVE

: LSSF3-HDFS-N

VALVE MODEL

MATERIAL: ASTM-A276 TYPE 316

JASON HUANG, QC MANAGER

: LSSF3HDFSN-F190403-5

: APR. 24, 2019

DATE

EXPORT NO : F190403

SHEET NO.

JY VALVE & MFG. CO.. LTD.

100	_		_	-	_	_	_	_		_			-
								Hardness (HB)	Max. 187	166			
5								Har	2				
	Mo	7000	2.00-3.00	2.2500				Reduction of area (%)	Min. 50	53			
	ž	10.044.0	10.0-14.0	16.8200 10.6000				Reductio (%	Min	2			
	ప	16.0.10.0	10.0-10.0	16.8200				Elongation (%)	Min. 40	48			
(%) II	Si	4 000	000.1	0.7500				Elongat	Min	4			
CHEMICAL REQUIREMENT (%)	S	0000	0.030	0.0230				ld Strength (MPa)	205	81			
CAL REQ	Ь	0.045	0.043	0.0020				Yield Strength (MPa)	Min. 205	218			
CHEMI	Mn	0000	2.000	0.96.0				Stength	515	8			
	O	0000	0.000	0.0700				Tensile Stength (MPa)	Min. 515	518			4
	ENT	MAX.)	Parts Name	STEM				UIREMENTS	Parts Name	STEM			HOT-FINISHED
	ELEMENT	SPEC (MAX.)	Production No	S-0319				TENSILE REQUIREMENTS	Production No	S-0319			Heat treatment

WE HEREBY CERTIFY THAT THE MATERIAL HEREIN DESCRIED ARE SATSIFACTORY IN ACCORDANCE WITH THE SPECIFICAITON.



Material Test Report

09/09/19

Cert No: 1101809

Cameron Newco is a 9001 certified registered company

CRN: OC7998.5C - EN 10204-3.1

13127 Trinity Dr., Stafford, TX 77477

Item No: B1060015FHLCCW27RF***GZA

Size/Type: 6" / Gate

Quantity: 1

Country of Origin: China

FigNo: 11F-LCC4/2-NC

Standard: API 598 / ASME B16.34 Test Pressure Pressure Test Result Seat Air 0.552 Item the requirements for NACE MR0103 and NACE Valve Materials meet Dimension: Passed Visual: Passed Tel: 281-302-4900 Fax: 281-302-4801

MLTS_6056-18971 Description: 150# RF A352-LCC (TRIM 12) OS&Y BB GATE Cert# 1101809 Cameron SO: QRC SO# 1010576 2610191-00 32043 Customer Number: Customer PO: Project Name: Valve Serial No: Customer Tag No: NACE

Heat No: N86718

Material Code: A352 LCC

Heat Treatment: QUENCHING+TEMPERING

Part: Body Type 3.1

Physical Props Physical Props Raduct National Range (National National N	718		Tensile KSi Yield KSI Blong % Reduct % Hard (HB) impact lb/ft	39.9 22.0	999.9 100.0 100.0 225.0	53.7 30.0 65.0 174.0	
Physical 70.0 Props 95.0	Heat No: N86718		Tensi	Physical 70.0	Props 95.0	80.5	
Ppec: C Cx Cu Mn Mo N1 P S S1 V N Max: 0.000 0.0	Material Code: A352 LCC	Notes:	Si V	Min: 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.	5 0.60 0.03	18 0.440 0.004	
Chem Rin: 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.	Ma		Cr Cu Mn Mo Ni P S Si	0.00 0.00	0.040 0.0	6 0.027 0.00	
0.00 0.50 0.50	2017		Ni	00.00	0.50	7 0.016	
0.00 0.20 0.007	STREET, STREET		Mo	00.00	0.20	0 0.007	
0.00 1.20 8 1.07	3.1	(0)	Min	00.00	1.20	8 1.07	
0 0.00 0 0.30 3 0.01	Type	MPERING	Cu	0.00	0.30	3 0.01	
0 0.00 5 0.50	et/Cap	HING+TE	Cr	0 0.00	5 0.50	90.00	
n: 0.0 x: 0.2 1: 0.18	Part: Bonnet/Cap Type 3.1	CONENCH	0 ::	D: 0.0	x: 0.2	1: 0.18	_
Chem Spec Comp Mi (%) Va	Part:	Heat Treatment: QUENCHING+TEMPERING	Spec:	Mi Mi		(a) Va	
ฮชี	K	Hea	1	3 6	5 5	-	

61/60/60 Signature

Comments: Cameron declares that the parts above are in accordance with applicable material specification and purchase order requirements. No Asbestos is contained in this product. Packing: Flexible Graphite | Gasket: Corrugated (316) W/ Grafoil Valves covered in this certificate are in full compliance with purchase order requirements and specifications.



13127 Trinity Dr., Stafford, TX 77477 Tel: 281-302-4900 Fax: 281-302-4801

Cameron Newco is a 9001 certified registered company CRN: OC7998.5C - EN 10204-3.1

Pressure Test Result Inspection

Customer: BMCO MLTS_6056-18971 Customer PO: 2610191-00 Cent# 1101813 Customer Number: 32043 Project Name: Valve Serial No

Cert No: 1101813

09/09/19

Material Test Report

Check Chec	Shell 1,103 (Pal) (Sec) Raused NACE	Shell Shel	-		1		T	t	I	Dogovintion 150# DD	35	TOT INDI	ON ICE MIDTH POT CAC
Heat Notest Backest 2.241 325 60 Passed Customer Tag No: For Seat Bydro	Seat Hydro	Seat Hydro 1.23 60 Peared Customer Tag No:			Ť	+	+	+	lenult	NACE NACE	2	332-DCC (1KI	332-17C (IKIM 12) 02
NACE Seat March 1,552 1,502 1,	Seat Hydro	Seat Hydro	a Mate	meet	Н	Н	Н	П	assed	Customer Tag No:			
Seat Atr 0.552 80 60 Passed	Seat Air 0.552 80 60 Pensed	Standard: Apr 598 / ASME B16.34	MPOTO	NACE	: Hydro			9					
Code: A352 LCC Heat No:	A352 LCC Heat No: N86708 Heat s: Physical 70.0 999.9 Props	A352 LCC	- COM	1	t Air c	H	80	٦	passed				
Heat No: N86708	A352 LCC Heat No: N86708 Tensile KSI 135.0 999.9 Props Props	A352 LCC Heat No: N86708 Physical 70.0 39.9 Props Props 80.5 52.9	MKO	(2)	Standard	: API 59	8 / ASM	E B16.34	-				
Notes: Tensile KSI Yield KSI	Physical 70.0 39.9 Props 95.0 999.9	Physical Tensile KSI Yd.1d KSI Xd.1d KSI Yd.1d Mate	ial Code: A35	2 LCC	TANKS OF THE	10 mg			Heat No: N86708		STREET, STREET,	STATE OF THE PARTY	
Si V Tensile KSi Yield KSI	Tensile KSi Y4e1d KSI Y2e1d KSI Y2	Tensile KSi Yield KSI Yell KSI Physical 70.0 39.9 95.0 999.9 80.5 52.9		Notes:									
	Physical 70.0 39.9 Props 95.0 999.9	Physical 70.0 39.9 Props 95.0 999.9 80.5 52.9	co.	Si V						Tensile KSI Yield KSI		Reduct %	Reduct % Hard (HB)
		0.04	0.05	.60 0.03						95.0	ä	100.0	225.0
A352 LCC Heat No: N86707				Notes:									N=8, 10 to 1
A352 LCC Heat No: N86707		Notes:	co.	Si V						Tensile KSI Yield KSI Elong %	Reduct %		ct % Hard (HB)
10.04 10.03 10.04 10.00 10	de: A352 LCC Heat No: N86707 Notes: Tensile KSI Y1e1d KSI Elong %	Notes: Tensile KSI Yield KSI Elong %	00	00.00 00.						Physical 70.0 39.9 22.0	35	35.0	
100.04 Heat No: N86707 Heat No: N86707 Heat No: N86707 Tensile KSI Yıtılı KSI Elong %	Heat No: N86707 Notes: Tensile KSI Y1614 KSI Elong %	Notes: Tensile KSI Yield KSI Elong % 22.0 39.9 22.0	05 (.60 0.03						Props 95.0 999.9 100.0	-	0.001	.00.0 225.0
A352 LCC Heat No: N86707 Tensile KSI Xiald KSI 22.0 Props Physical 70.0 39.9 100.0 Props	Heat No: N86707 Notes: Tensile KSI Yield KSI Elong % 22.0 Props 95.0 999.9 100.0	Notes: Tensile KSI Yield KSI Elong % Physical 70.0 39.9 22.0 Props 95.0 999.9 100.0	0070	Val: 0.190 0.052 0.018 1.120 0.006 0.016 0.029 0.007 0.490 0.004						80.5 56.6 29.0		0.09	60.0 172.0

09/09/19 Signature

Baker Lake Bulk Fuel Storage Facility: Environmental Performance Monitoring Plan Version 6.1, March 2022

Appendix A6

Construction Summary Report: Baker Lake Fuel Storage Tank 8 (2021)



Construction Summary Report

Baker Lake Fuel Storage Tank #8

Agnico Eagle Mines Ltd





Engineering, Design and Project Management

07 | 12 | 2021

report

Internal ref. 681783-0000-40ER-0001_R0





CONSTRUCTION SUMMARY REPORT Baker Lake Fuel Storage Tank #8

Agnico Eagle Mines Ltd

Report

6129-740-132-REP-001 December 7, 2021

Authorized Signatory:



EXECUTIVE SUMMARY

SNC Lavalin Inc. was retained by Agnico Eagle Mines Limited to prepare a construction summary (as built) report for the fuel storage tank #8 facilities of the Meadowbank Gold Project, Nunavut. SNC Lavalin Inc. previously prepared the construction drawings and specifications for the fuel storage tank facilities.

SNC Lavalin Inc. wasn't involved in the construction of the fuel storage tank, the information presented in this report was provided in part by Agnico Eagle.

The construction of the fuel storage tank facilities was completed in October 2021. The construction monitoring and quality assurance was managed by Agnico Eagle.

This report summarizes the construction as-built information for the fuel storage tank #8 facilities.



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	2.2 Fuel tank s	size	5
	2.3 Tank Foun	dations Design	5
	2.4 Berms Des	sign	5
	2.5 Secondary	Containment Capacity	6
	2.6 Drawings a	and photographs	6
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3.	Field decisions		7
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4.	Mitigation mea	sure	7
5.	Construction m	nonitoring and inspection test plan	7
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Ŭ		Lake Fuel Farm Site Overview (tank #7 and #8)	4
ııg		Lake I del I allii Sile Overview (lalik #1 alid #0)	-
	oles		_
	•	ption of the fuel farmparameters for the tank foundations	
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Ap	endices		
	Appendix A	Final Construction drawings	
	Appendix B	As built drawings	
	Appendix C	Photographs	
	Appendix D	Fuel tank handover package	



1. Introduction

This document presents the fuel storage tank 8 facilities construction summary report required by the Water Licence 2AM-MEA1530 Part D Item 14 and Part G Item 4. As required by Water Licence Schedule D, this report contains the final design and construction drawings, a summary of construction activities including pictures recorded before, during and after construction. The as-built drawings, detailed explanation of field decision to reflect any deviations from the original construction drawings/plans and how such deviations may affect performance of engineered structures, a discussion of the mitigation measures implemented during construction and its effectiveness are also presented.

2. Construction Summary

2.1 Site location plan

Agnico Eagle is developing the Whale Tail Project in the Kivalliq Region of Nunavut (65°24'25" N, 96°41'50" W). The 99,878-hectare Amaruq property is located on Inuit-owned and federal crown land, approximately 55 km north of the Meadowbank mine. The Meadowbank mine is accessible from Baker Lake, located 70 kilometers to the south. The Baker Lake Bulk Fuel Storage Tank Facility is located east of the hamlet of Baker Lake, on the north shore of Baker Lake.



Figure 1 – Baker Lake Fuel Farm Site Overview (tank #7 and #8)



2.2 Fuel tank size

Baker Lake fuel farm now includes eight (8) 10M liter fuel storage tank. This report is based on tank #8 construction, built in summer/fall 2021.

The Table 1 below presents the tank main dimensions.

Table 1 – Description of the fuel farm

Fuel farm Description	Baker Lake fuel tank 8
Product	Diesel
Volume (liter)	10 M
Diameter (m)	33.5
Height (m)	12.2

The detailed design drawings of the tank 8 are presented in Appendix A.

2.3 Tank Foundations Design

The tank foundation pad is built 2 meters lower than the surrounding ground with a minimum total thickness of 800 mm of compacted material which includes the liner system. A 3 m shoulder surround the tank with a slope of 1V:2H away from the tank. The embankments of the foundation pad are no steeper than 1V:2H.

The Table 2 below presents the design parameters for the tank foundations.

Table 2 – Design parameters for the tank foundations

Tank Foundation Pad	
Tank Diameter (m)	33.5
Tank foundation pad top (m)	2x 18.0 x 18.0
Tank foundation pad average thickness, above surrounding ground (m)	1.2
Slope on shoulder	1V:2H
Embankment slope	1V:2H

2.4 Berms Design

The storage tank is enclosed inside berms to contain accidental spillage of fuel product. The berms are made of granular material and are made impervious with a geomembrane. For more detail regarding containment, consult document 653281-0004-40ER-0005_0 Baker Lake Fuel Storage Tank #7 and Containment Facilities construction summary report.

6129-740-132-REP-001



2.5 Secondary Containment Capacity

The required capacity of the fuel farms section was calculated based on the following codes and regulations:

- National Fire Code of Canada (NFCC);
- > National Fire Protection Association (NFPA); and
- > Design Rationale for Fuel Storage and Distribution Facility (DRFS).

As per the latest edition of NFCC, art. 4.3.7.3, the required secondary containment capacity for a fuel farm must have a volumetric capacity of not less than the sum of:

- > A) The capacity of the largest storage tank located in the contained space, and;
-) B) 10% of the greater of:
 - i. The capacity specified in Clause (A), or;
 - ii. The aggregate capacity of all other storage Tanks located in the contained space.

The volume occupied by the Tank foundation is considered in the total secondary containment capacity. The height of the secondary containment capacity is 300 mm lower than the berms' maximum elevation. Based on the above-mentioned, the secondary containment capacity requirements and the available capacity for fuel farms are summarized in the Table 3.

New section

Volume (liter) 20 M (2X 10M)

Required Containment Capacity (liter) 12 M

Available Containment Capacity (liter) 20M

Table 3 – Fuel farm containment capacity

2.6 Drawings and photographs

Fuel farm tank final design and construction drawings are available in the Appendix A, construction pictures are available in Appendix C.

2.7 Timeline

The baker lake fuel storage tank # 8 was built in 2021. Earth work started on July 2021, followed by tank and piping fabrication in August and September 2021. Tank #8 construction ended September 8th, 2021, Piping installation work were finalised on October 12th, 2021.



3. Field decisions

3.1 Equipment and controls

Fuel tank #8 was built as in Document 6120-C-260-001-REP-001 Fuel Tank Storage and Containment Facilities Design Report and Drawings. This document presents the rational and decisions that led to its construction. No modifications were performed, and the Fuel storage tank is operational as it was designed.

3.2 Piping

Piping between filling line and the fuel tank respect the point-to-point design. The piping can be seen on photos in Appendix C and respect the P&ID. Red mark drawings can be consulted in Appendix B. Modifications made to the piping won't affect the construction performance in any ways.

4. Mitigation measure

No Quarrying activities where required to build tank #8. No blast were done on the construction site. During the fuel storage tank construction, no sediments were released in water from construction areas and no water was used to manage dust emissions from construction activity.

5. Construction monitoring and inspection test plan

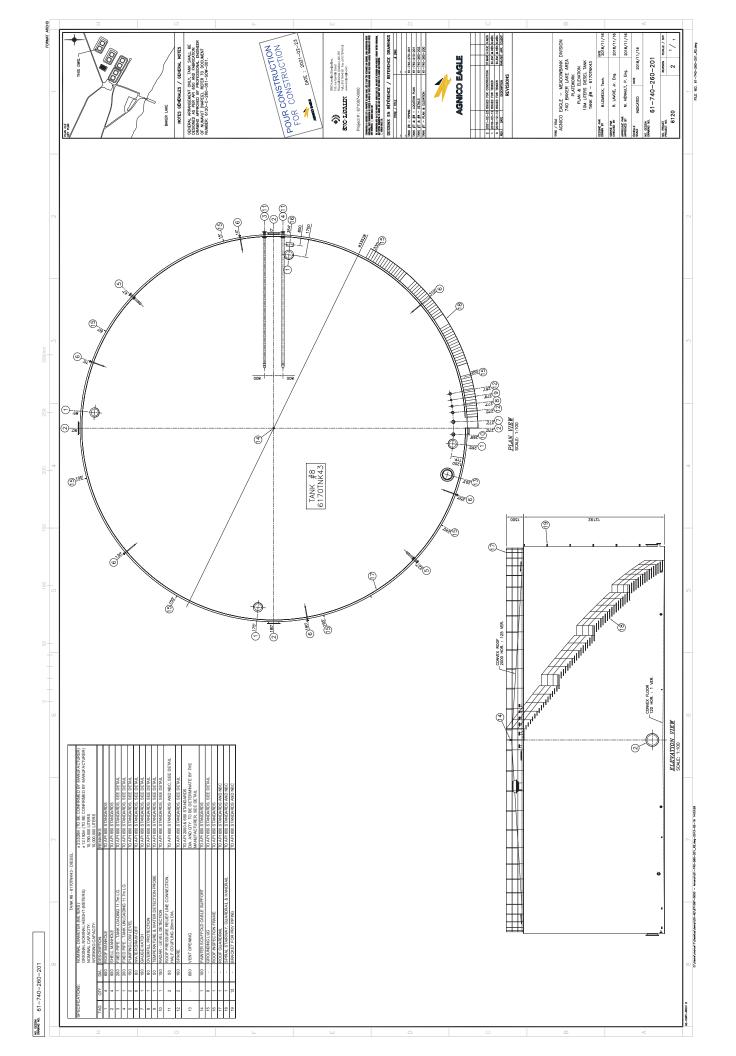
5.1 Tank weld

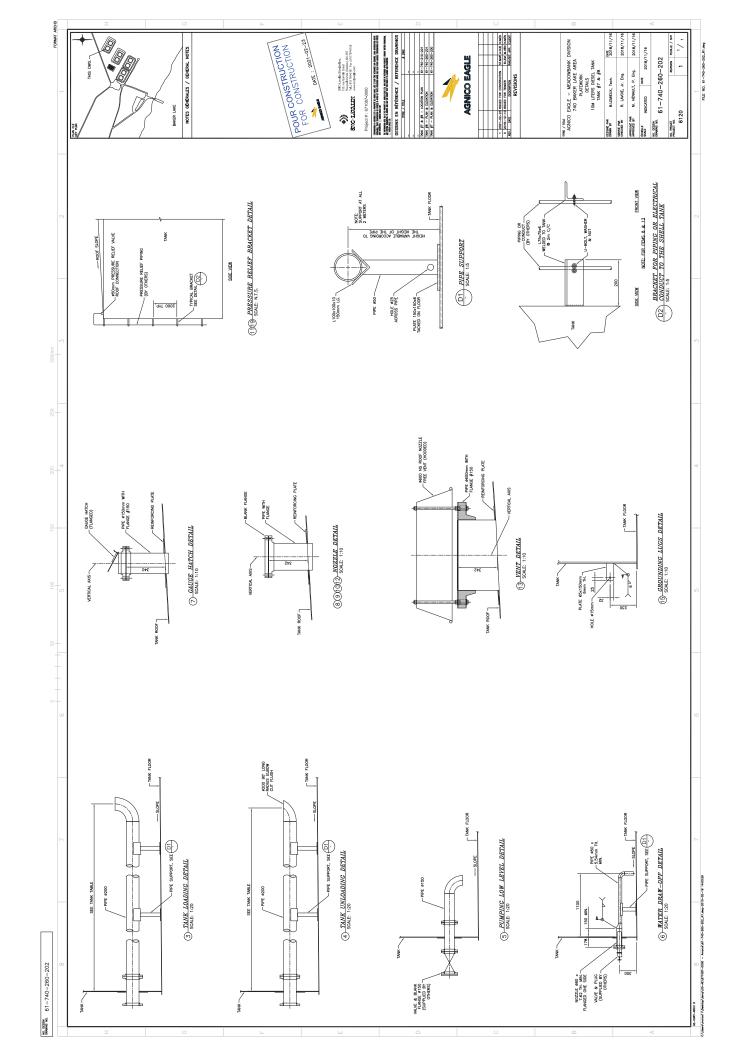
During the tank construction, a testing protocol was followed by the construction team. To meet API Standard 650, companies building tank are required to monitor their work trough an inspection program. In this program, the contractor registers welder's qualifications, confirm construction material quality and outlines its testing protocol. The results from weld tests are also registered there. All that information is required by API 650 standard. Testing on welds took place during the whole construction process. To attest welds quality, inspector relied on visual inspection, magnetic particulate tests and high penetration oil tests. To review those tests results, the materials quality and weld inspection results can be consulted in Appendix D.

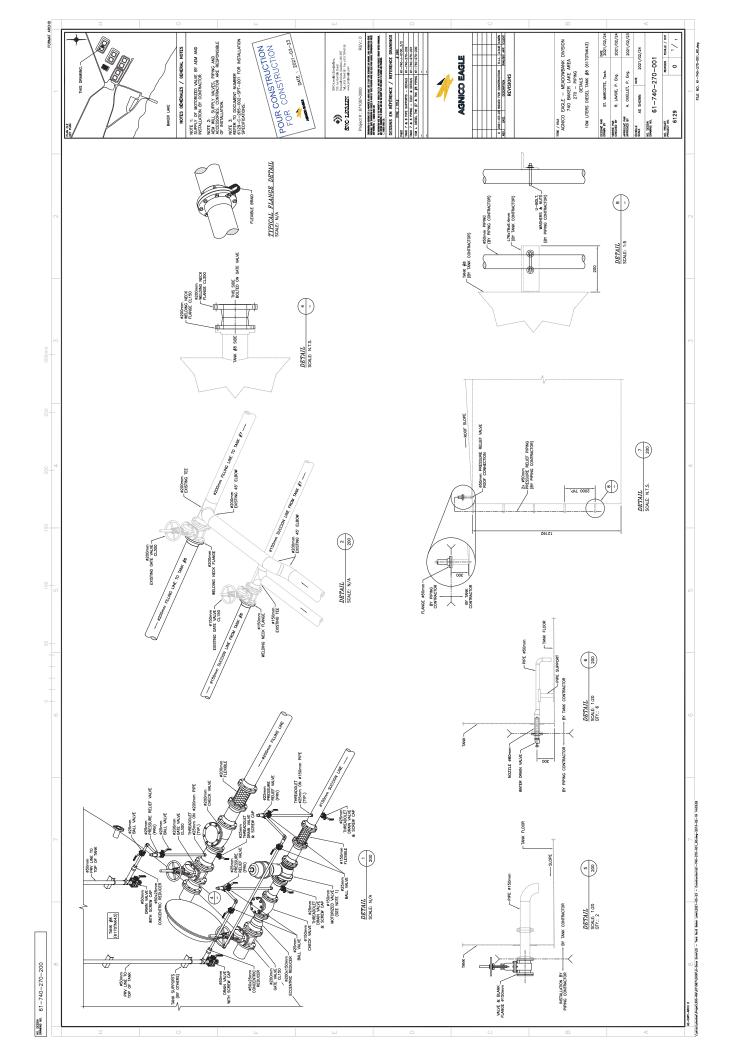
Appendix A

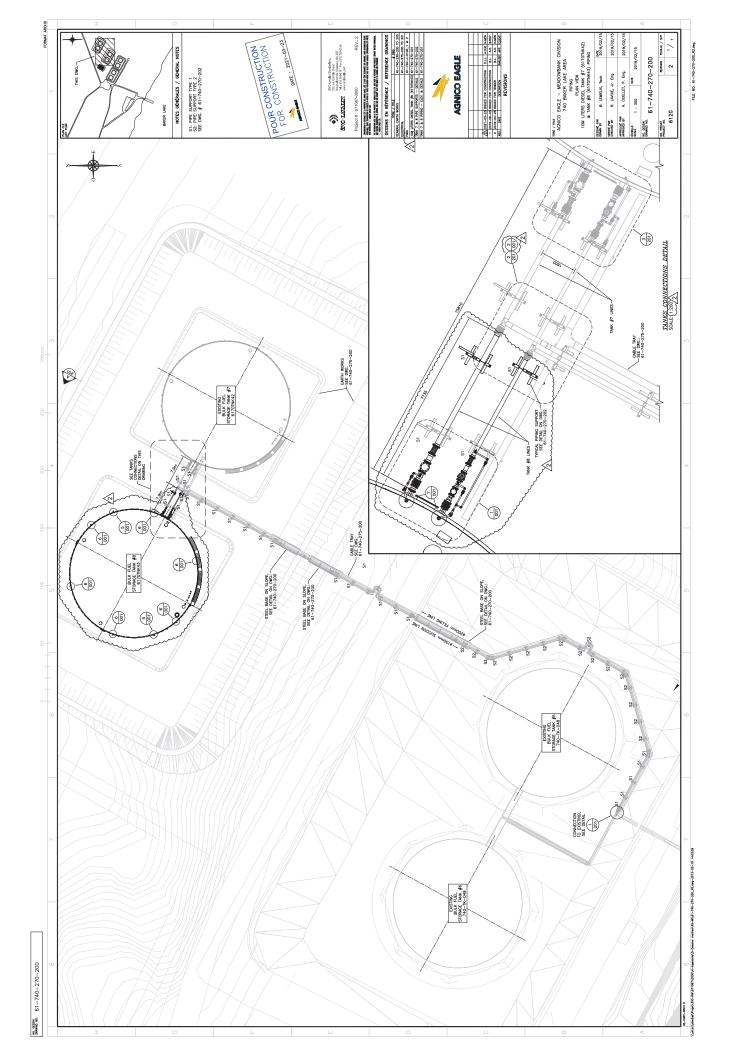
Final construction drawing

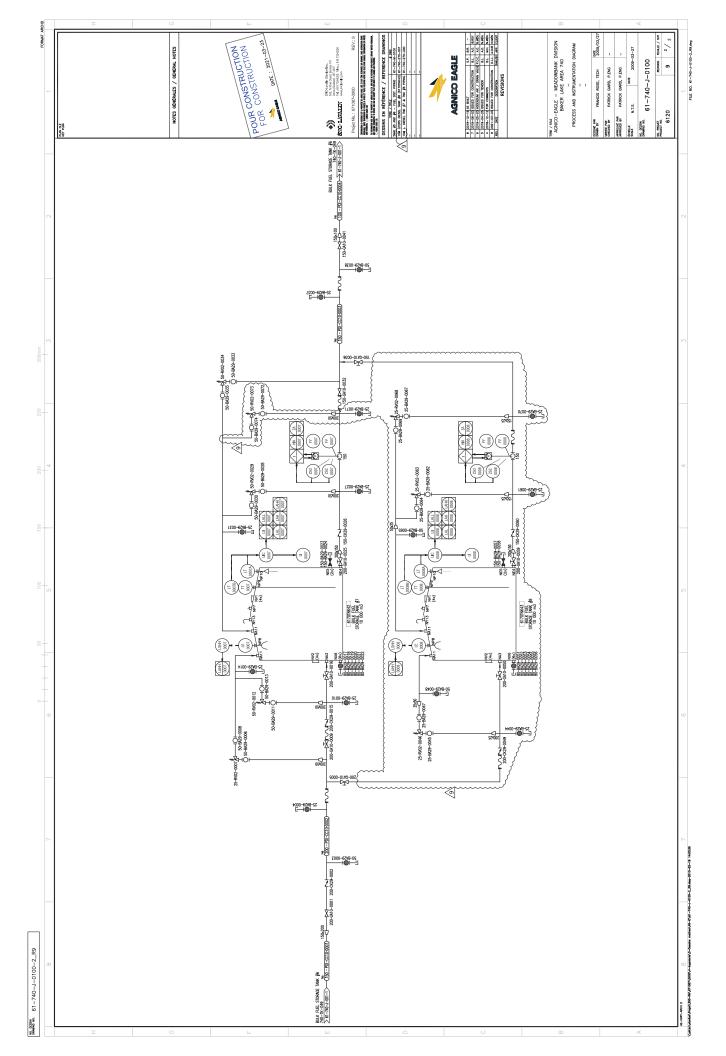












Appendix B As built drawing

reser, v. Projet, 2001 (4-10) (4-10) (4-10) (4-10) (40

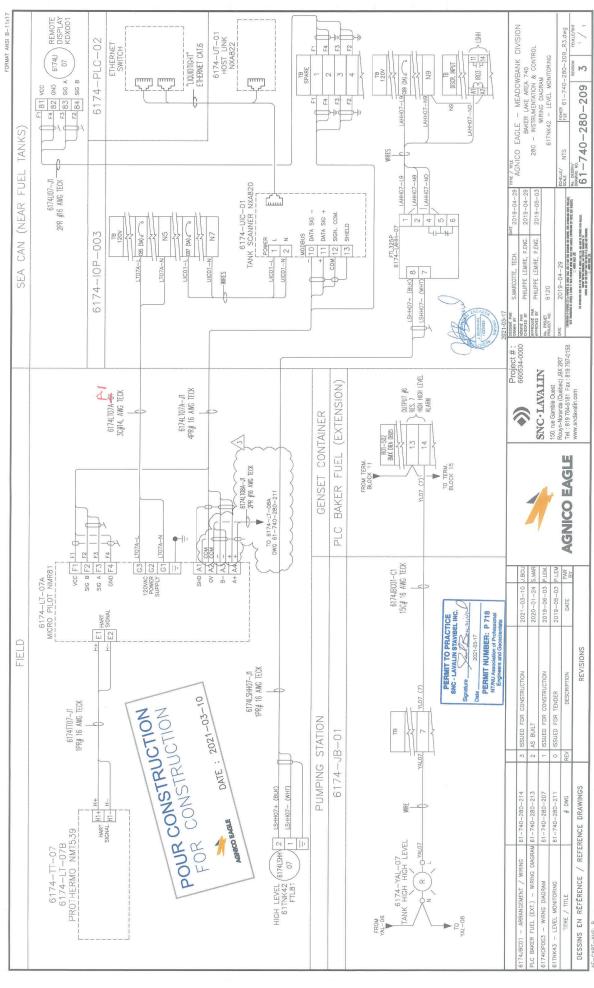
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61-740-285-200

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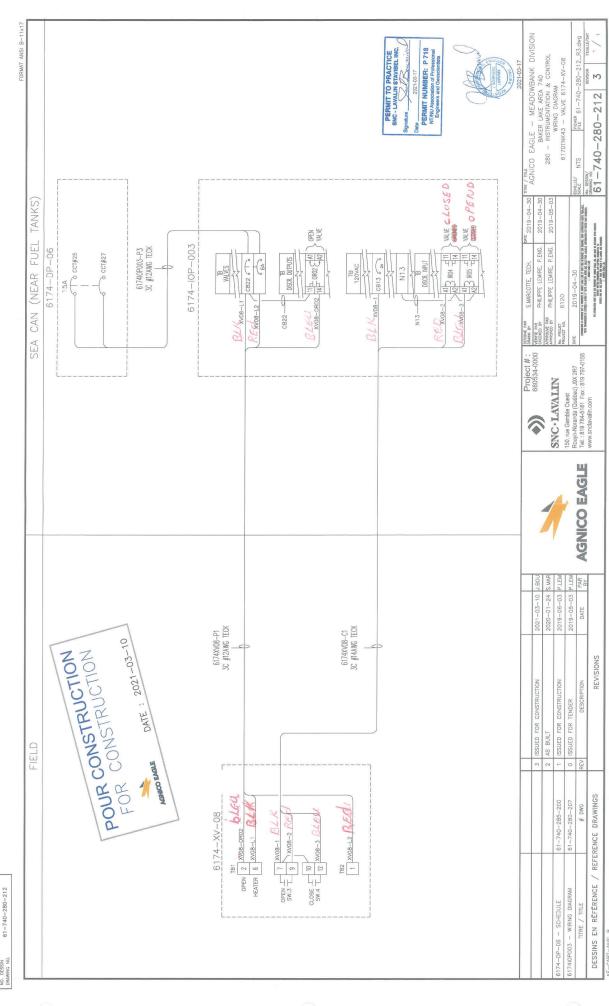
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FILE NO. 81-740-275-201_F3.46

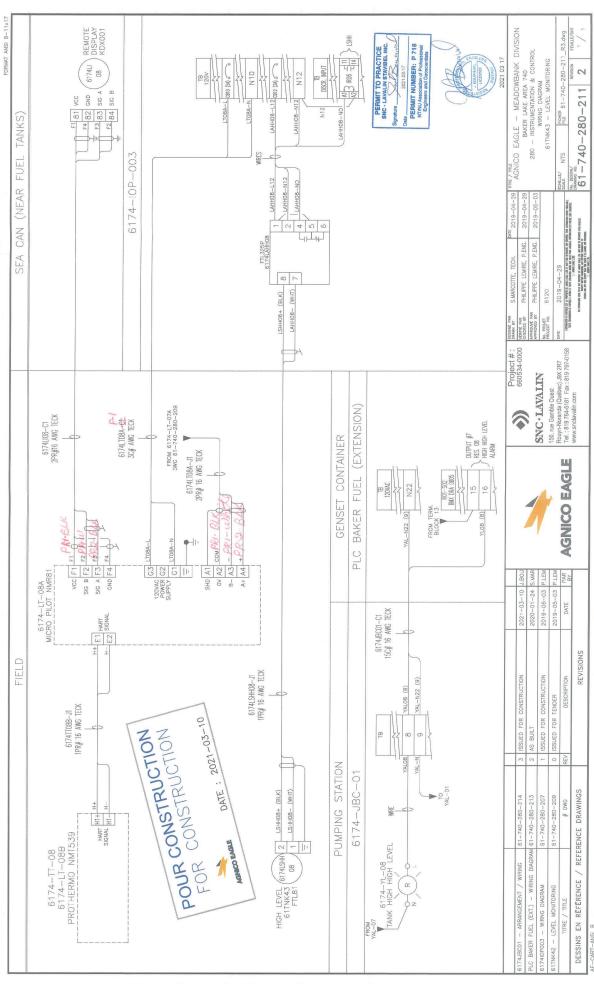


61-740-280-209

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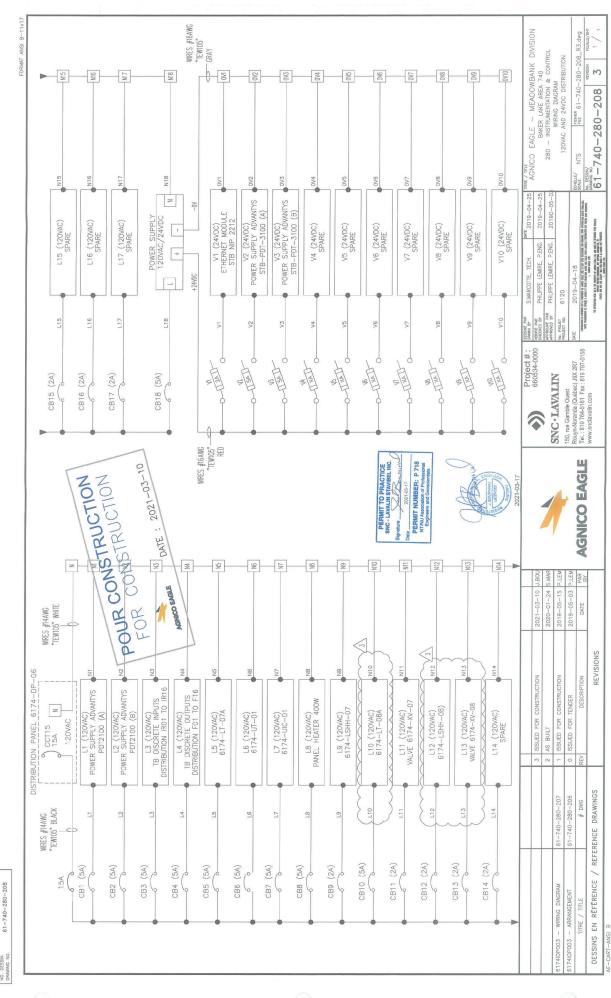


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61-740-280-211

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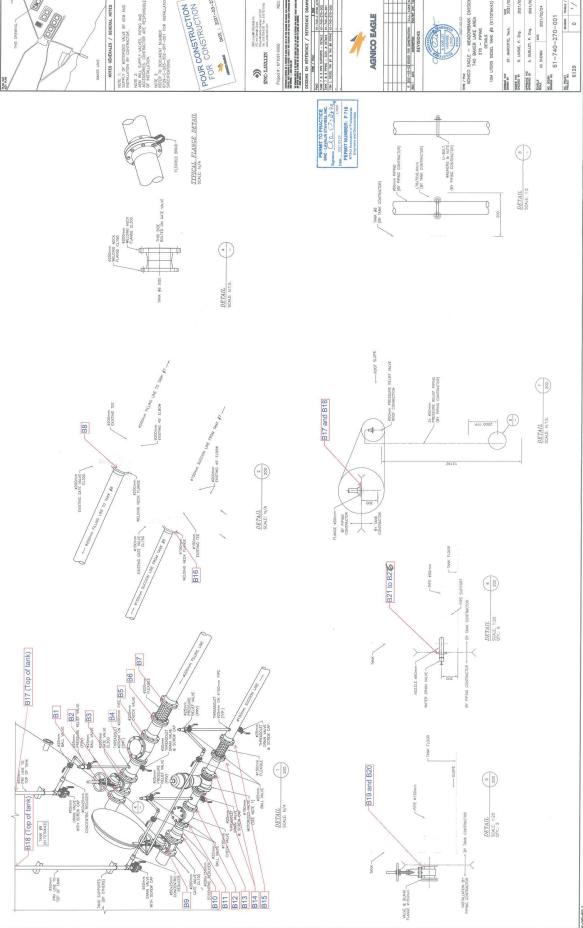


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	OWNE	or or	Agnico Fagle Mines	W. Company	BY:	Nathan Bisson							
4	PROJE	PROJECT NAME:	Baker Lake Fuel Farm	-uel Farm	ROVED:	Roxanne Lavoie, P. Eng. (OIQ) / I.Gagnon P. Eng	non P.Ena.						
♠	PROJE	PROJECT NO:	6129-S-265-020	020		0 - For Tender							
SNC 1 AVAITN		:0:	6129-S-265-C	6129-S-265-020-MTO-002	DATE:	2021-06-30					-		
SINC TRANSFIL	F		MTO Pipi. Drawing numbe	MTO Piping - Baker Lake Fuel Farm Dawing number: 61-740-270-003			MATERIAL TAKE OFF Description	IE OFF			AGNICO EAGLE	GLE	
Rev. Date	Qtb,1	by ¹ Unit	nit Description	u	QN	STANDARD	SCH./PN	PACKAGE #	# OLW	MATERIAL	MANUFACTURER	MODEL	REMARKS
							PIPING AND FITTING TABLE	4G TABLE					
2021-06-30	260	m 05	n STEEL PIPING		Ø150mm	ASTM A333 GR.6	SCH. STD			CARBON STEEL			SHOP PAINTED AS PER 60-000-245-GGD-001. YELLOW
2021-06-30	20	TINO	UT WIELDING NECK FLANGE	CK FLANGE	Ø150mm	A350 GR. LF2	CL150			FORGED STEEL			SHOP PAINTED AS PER 60-000-245-GGD-001. YELLOW
2021-06-30	2	UNIT	IIT BUND FLANGE		Ø150mm	ASTM A420 GR.WPL6	CL150			FORGED STEEL			SHOP PAINTED AS PER 60-000-245-GGD-001. YELLOW
2021-06-30	19	TINU 6	11T 45° ELBOW BUTT WELD	JTT WELD	Ø150mm	ASTM A420 GR.WPL6, BW	SCH, STD			FORGED STEEL			SHOP PAINTED AS PER 60-000-245-GGD-001. YELLOW
2021-06-30	4	TINU		90° LONG RADIUS ELBOW BUTT WELD	Ø150mm	ASTM A420 GR.WPL6, BW	SCH. STD			FORGED STEEL			SHOP PAINTED AS PER 60-000-245-GGD-001. YELLOW
2021-06-30	10	TINO	IIT STRAIGHT TEE BUTT WELD	в витт weld	Ø150mm	ASTM A420 GR.WPL6, BW	SCH. STD			FORGED STEEL			SHOP PAINTED AS PER 60-000-245-GGD-001. YELLOW
2021-06-30	17	TINO		WELDED 45° LATERAL BUTT WELD	Ø150mm	ASTM A420 GR.WPL6, BW	SCH. STD			FORGED STEEL			SHOP PAINTED AS PER 60-000-245-GGD-001, YELLOW
2021-06-30	2	2 UNIT		E, 350 mm Lg.	Ø150mm	FLANGED	CL150			STAINLESS STEEL	SENIOR FLEXTRONICS	SA-BSFS SERIES	
2021-06-30	1	TINO	IT FLEXIBLE HOSE, 450 mm Lg.	E, 450 mm Lg.	Ø150mm	FLANGED	CL150			STAINLESS STEEL	SENIOR FLEXTRONICS	SA-BSFS SERIES	
2021-06-30	9	TINU		ECCENTRIC REDUCER BUTT WELD	Ø150x100mm	ASTM A420 GR.WPL6, BW	SCH. STD			CARBON STEEL			SHOP PAINTED AS PER 60-000-245-GGD-001. YELLOW
2021-06-30	9	TINO	NIT BUND FLANGE		Ø100mm	ASTM A420 GR.WPL6	CL150			FORGED STEEL			SHOP PAINTED AS PER 60-000-245-GGD-001. YELLOW
2021-06-30	10	O UNIT	IIT WIELDING NECK FLANGE	CK FLANGE	Ø100mm	A350 GR. LF2	CL150			FORGED STEEL			SHOP PAINTED AS PER 60-000-245-GGD-001. YELLOW
2021-06-30	e	UNIT		THREADOLET FOR Ø150mm PIPE	Ø25mm	ASTM A350 GR.LF2	CL3000			FORGED STEEL			
2021-06-30	2	E	n PIPING		Ø25mm	ASTM A333 GR.6	SCH. 80			CARBON STEEL			SHOP PAINTED AS PER 60-000-245-GGD-001. YELLOW
2021-06-30	m	NUU	IIT SCREW CAP		Ø25mm	FORGED STEEL	CL3000			FORGED STEEL			
2021-06-30	22	2 UNIT	IIT FLEXIBLE BRAID	. 0		E	£				NVENT	MBJ 35-250-25	
						PI	PIPING AND SUPPORT TABLE	IRT TABLE					
2021-06-30	12	2 UNIT		TYPE 1 PREFAB PIPING SUPPORT ON DRAWING 61-740-270-XXX	2	HSS G40 350 W OR ASTM A500				STRUCTURAL STEEL			SHOP PAINTED AS PER 60-000-245-GGD-001, GREY
2021-06-30	43	3 UNIT		YPE 2 PREFAB PIPING SUPPORT ON DRAWING 61-740-270-XXX		HSS G40 350 W OR ASTM A500				STRUCTURAL STEEL			SHOP PAINTED AS PER 60-000-245-GGD-001, GREY
2021-06-30	4	TINO		TYPE 3 PREFAB PIPING SUPPORT ON DRAWING 61-740-270-XXX	3	HSS G40 350 W OR ASTM A500	,			STRUCTURAL STEEL			SHOP PAINTED AS PER 60-000-245-GGD-001. GREY
2021-06-30	15	TINU		EXTRA GREY PAINT GALLONS		E	c						FOR PAINT TOUCH-UP ON SITE
2021-06-30	10	TINU		EXTRA VELLOW PAINT GALLON		š				(0.)			FOR PAINT TOUCH-UP ON SITE
							VALVE TABLE	T.					
2021-06-30	7	7 UNIT	IIT GATE VALVE		Ø150mm	ASTM A-352, FLANGED	CL150	The last of the la		201	BERIC	API 600 LCC BODY	
2021-06-30	8	3 UNIT	IIT BALL VALVE API 607	PI 607	Ø25mm	SOCKET WELD				רככ	APOLLO	83L-240-24 SERIES	
1 No contingency was p	planned or.	n material take	te off list and no m.	1 No contingency was planned on material take off list and no material was planned for field adjustment.									



FILE NO. 61-740-270-200_R2.0s



Development No. 61-740-270-200

No. octions No. 61-740-270-200

Document No. 61-740-270-200

Latt/proba/fyzo-tot/(1987/0000)-0-best Enth(22 - 19th But Lath/201-0)-25 - Controvering (31-40-270-05), (Bitton-201-0)-10-10

Appendix C Photographs



Tank #8 pad before construction



Tank floor construction



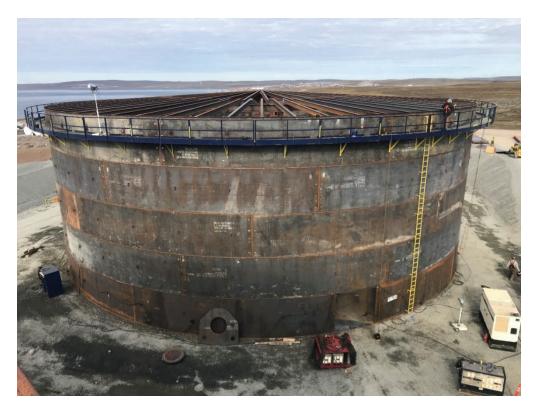
Weld testing with vacuum



Tank wall welding



Tank wall third ring installation



Tank general view



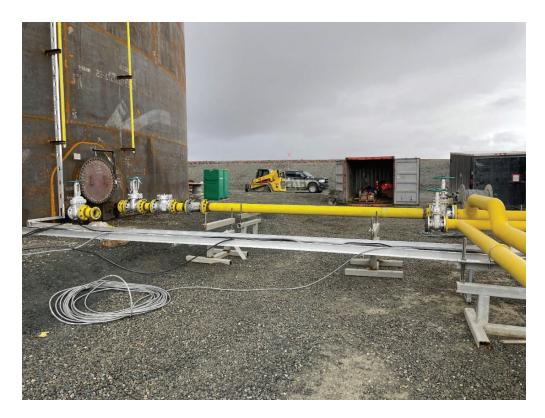
Tank roof structure



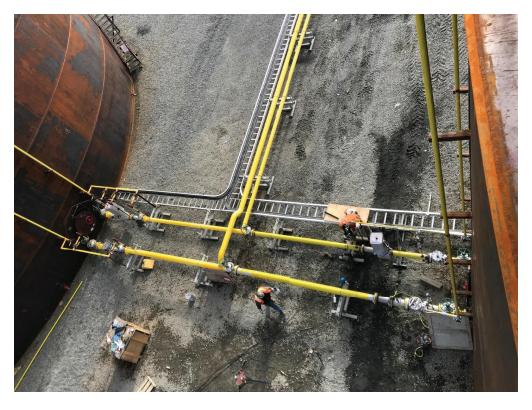
Tank roof plate welding



Control cable tray and over pressure valve piping



Tank #8 piping installation



Tank #8 piping overview