

Certificate of Conformance New Manufacture

MSL 13-2194
Date: 20 Jun 2013

Customer: CAM DRILLING SYS - KATY

Cameron Sales Order Number: 2323805

Customer PO N°: 4700707109

Cameron Internal Tracking Number:
Project n°: TRANSOCEAN - AUSTRALIA - JACK BATES

Cameron certifies that the item(s) described herewith is (are) in conformance with the requirements of the above Purchase Order Number and fully comply with applicable Cameron specifications in effect at the date of manufacture. All related documentation in support of the above statement is retained on file by Cameron for a minimum of 10 years from date of manufacture and can be made available to the purchaser upon request.

Item #	Part Number	Rev #	Description	Qty	Serial Number(s)		
10	2163588-26	03	BOP, 18-3/4" 10M, 'DL' CX-18 STUD TOP X CX 18 CLAMP HUB BOTTOM INCONEL 625 LINED RING GROOVES, WITH 625 INLAY PER SD-045553-02 PER API 16A T-20 3RD ED SP-005050-51	1	112756859-1		

Additional Endorsements (if applicable)	Endorsement Report /License Number (If Applicable)
API 16A,3rd ed.	Monogram:License n° 16A-0086.6
NACE MR0175 -2000	

Notes on Scope of Certification

All documents and inspection reports to support this certificate of conformance have been verified to the best of my knowledge to be true and correct

Michael VEILLE
 Cameron Quality
 Representative Name


 Signature




 28 Jun 2013
 Date

AK

TEST REPORT ANNULAR BOP

DL

P/N **2163588-26** SIZE **18,3/4"** PRESSURE **10 000 PSI**
BEZIER'S ORDER REF **2323805** ITEM **10** OF **112756859-01**

A - BODY TEST

PRESSURE **15 000** PSI Time (min) **3+15** ☒ OK OPEN 3000 PSI ☒ OK
Operating fluid **ERIFON**
Simultaneous Test Open and Closed Pressure **4500**
Open Side Pressure **3000** PSI Time (min) **3+15** ☒ OK
Close Side Pressure **3000** PSI Time (min) **3+15** ☒ OK

C - ANNULAR PACKING CLOSURE ON DRILL PIPE

L.P. Pressure **170** PSI Time (min) **10** ☒ OK
H.P. Pressure **10 000** PSI Time (min) **10** ☒ OK

REMARKS

Drift Test ☒ OK **5368**
Pipe Mandrel ☒ OK Size **5"**

Visual inspection after test : Seals, Seal Grooves ☒ OK } by : **Borbaud**
Packer ☒ OK

Comments :

Tested by : **RECONVIER / PRAVET**

Controlled by : **Riviere / Ronera**

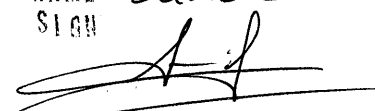
Date : 19/06/2013

Tests are certified in accordance with procedure :

X-102399-01

Rev : **6**


Witnessed
20 JUNE 2013
S. LEBLANC

DATE **21/06/13**
TEST : **PASS / FAIL**
NAME **Riviere**
SIGN 



TEST BOP

DATE 19/06/2013

ITEM 10

PRESS. SCALE 5800 PSI

FUNCTION SIMULTANEOUS

SERIAL N° 112756859-01

HP 1284 PSI

ORDER N° 2323805

OPERATOR DECOTTIGNIES

LP PSI

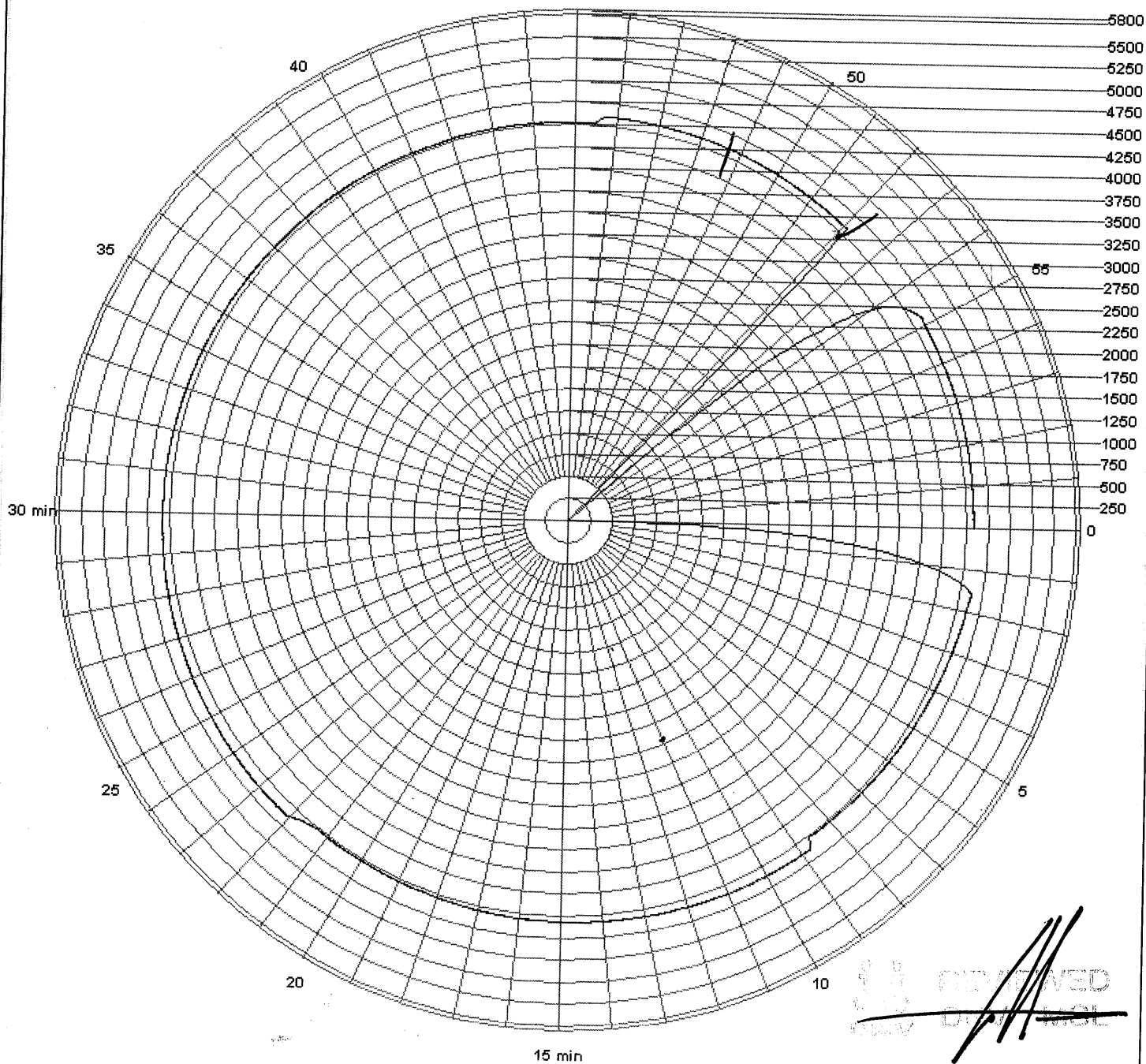
SENSOR P1

DISK 1/3

4500 PSI

45 min

PSI



TEST OK ☒

TEST FAILED ☐

TEST OK



TEST BOP

DATE 19/06/2013

ITEM 10

PRESS.SCALE 5800 PSI

FUNCTION SIMULTANEOUS

SERIAL N° 112756859-01

HP 1284 PSI

ORDER N° 2323805

OPERATOR DECOTTIGNIES

LP PSI

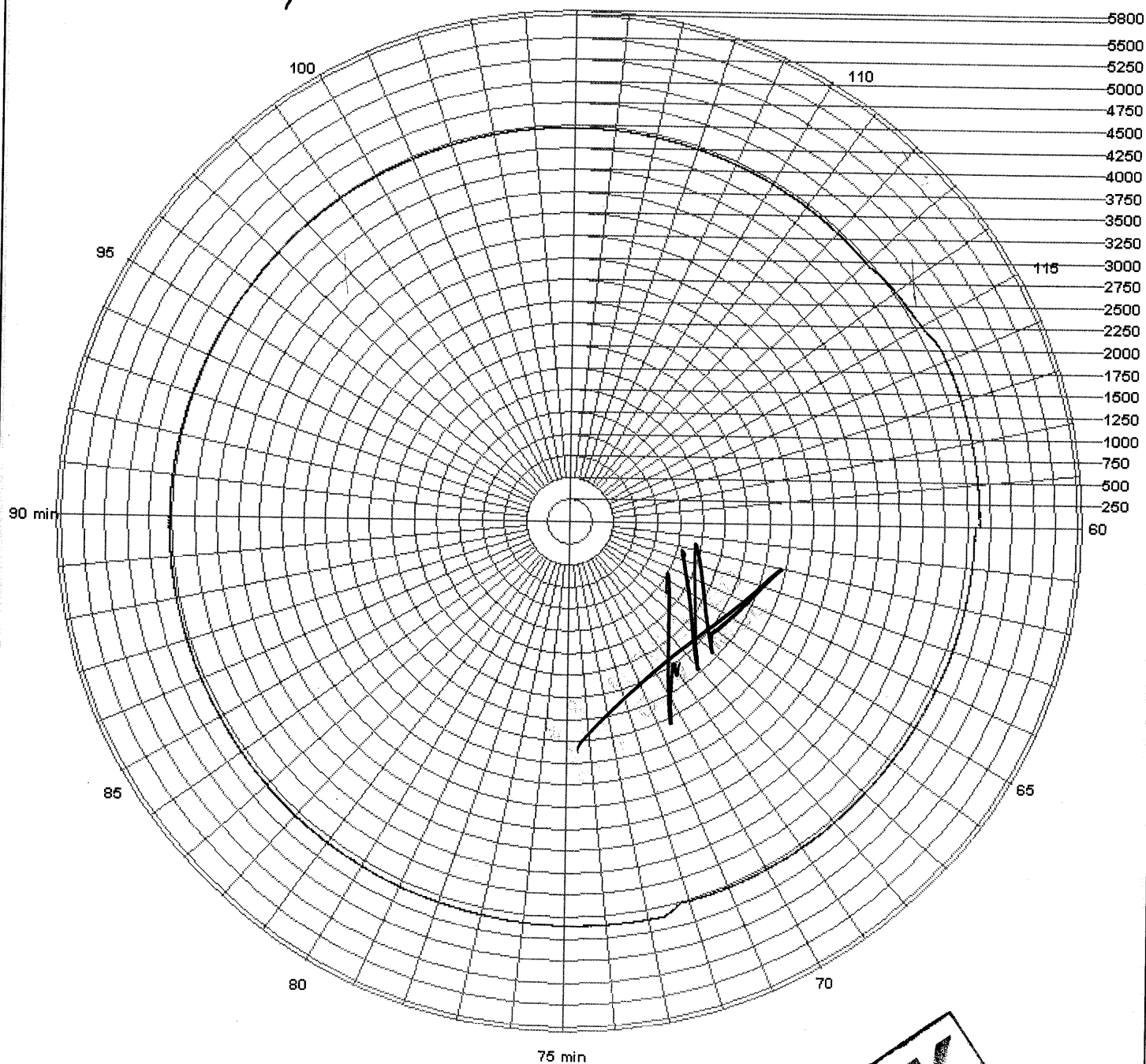
SENSOR P1

DISK 2 / 3

4500 PSI

105 min

PSI



TEST OK ☒

TEST FAILED ☐

TEST OK



TEST BOP

DATE 19/06/2013

ITEM 10

PRESS.SCALE 5800 PSI

FUNCTION SIMULTANEOUS

SERIAL N° 112756859-01

HP 1284 PSI

ORDER N° 2323805

OPERATOR DECOTTIGNIES

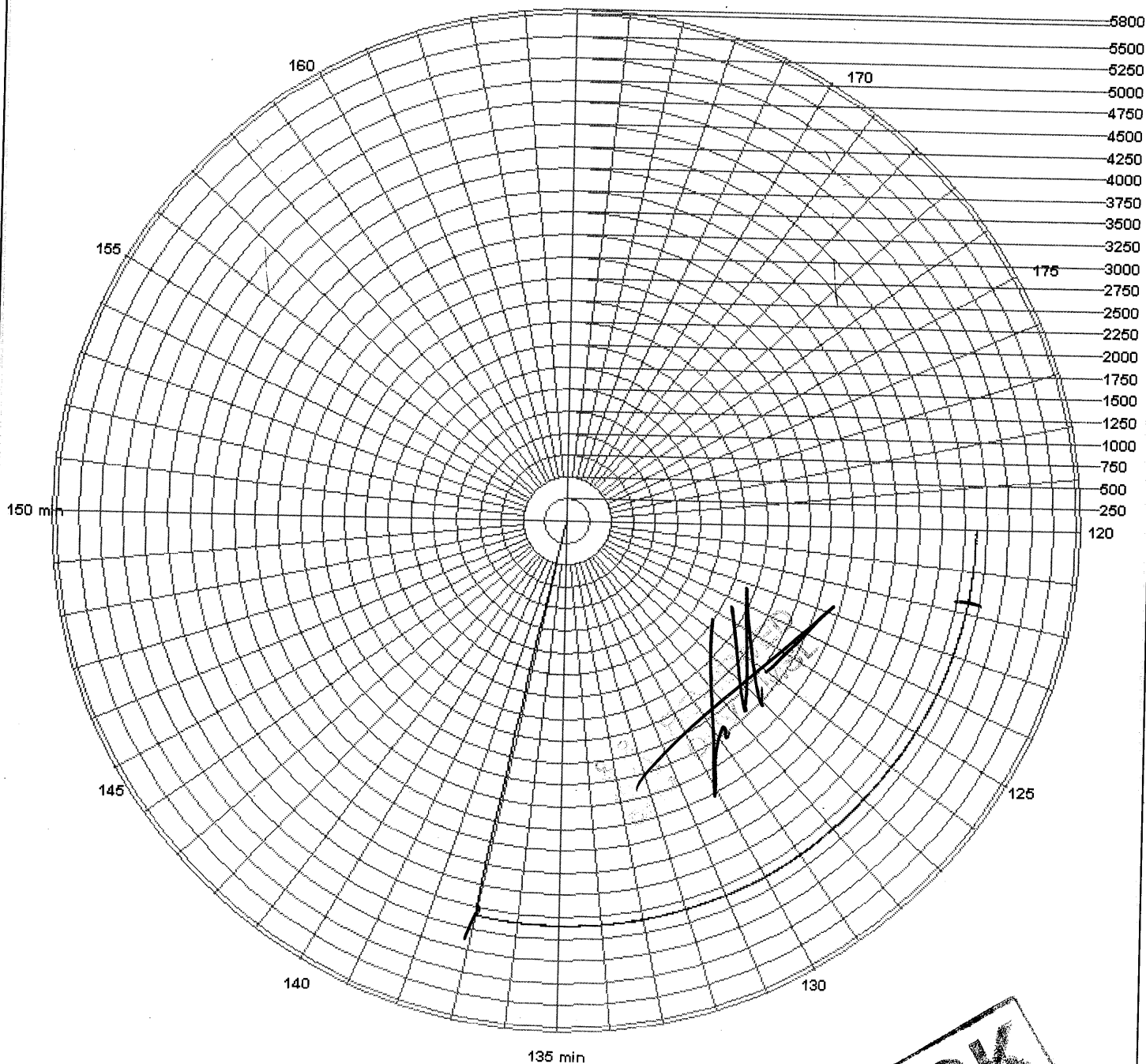
LP PSI

SENSOR P1

DISK 3/3 6500 PSI

165 min

PSI



TEST OK ☒

TEST FAILED ☐

TEST OK

MATERIAL TRACEABILITY RECORD

Part Number: 2163588-26

Rev: 03

Qty: 1

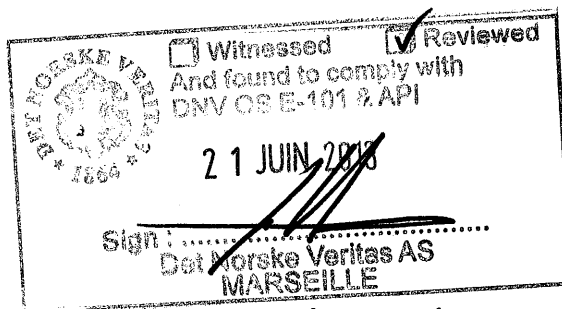
BOP, 18-3/4" 10M, 'DL' CX-18 STUD TOP X CX-18 CLAMP
HUB BOTTOM INCONEL 625 LINED RING GROOVES,
WITH 625 INLAY PER SD-045553-02 PER API 16A T-20
3RD ED SP-005050-51

Serial N° 112756859-1

We, Cameron FRANCE, S.A.S. certify that the above mentioned ,meets order requirements and Cameron specifications, manufactured and tested according to referenced API.(Hardness Test Report According to X-008065 & applicable Quality plan), Dimensional check found Satisfactory.

	Assy BOP	Body	Top	Piston	Inner cylinder	Outer cylinder	Pusher plate
Serial n°	112756859-1	112539069-1	112567412-1	112572130-1	112663298-1	112677723-1	4503698926-2-1
Heat n°		85658	21878	4365-12	4153-12	208631	025960
Heat treat.		2059	12/1460	2113	127108	127674	7183
HBN		205/198/210	214	222	207	229	207

	Packer	Donut
Serial n°	112706281-11	112708809-06
Assy Sn°	112729871-07	



All 3.1 material certificates listed
here above reviewed



Beziers,

QC Stamp



29501 Katy Freeway • Katy, Texas 77494



**"D" or "DL" Annular Sealing Element Assembly
Test Report**

Production Work Order No: 112729871 Packer Cure Date: 03-2013
Assembly Part # 2232688-01-00-01 R01 Assembly Serial #: 112729871-07
Packer Assembly Size: 18 3/4" SS Rated Working Pressure: 10M
Packer Serial #: 112706281-11 Donut Serial #: 112708809-06
Packer Starting ID: 20.5" Packer Finish ID: 18 3/4"
Packer Duro Hardness: 75 Test Per Procedure, Rev: 03X-102399-01
Temp. Class: XG Batch #: 112713713

Test Equipment	Gauge No.	Rated Pressure (psig)	Calibration Due Date
Wellbore Transducer	1624	30 000	04-24-2013
Operating Sys. Transducer	1302	500	
Wellbore Gauge	1477	20 000	
Operating System Gauge	1477-A	5,000	
Low Pressure Gauge	—	600	
Strip Chart Recorder	1484	N/A	04-24-2013
Drift	1417	N/A	09-28-2014

Pipe Mandrel Size: 5"

Testing Data

	Number of Closures	Time Lapse	Actual Pressures	
			Wellbore (psig)	OS Close (psig)
Open Hole Test				
Low Pressure Test	1116	10 min	300	3000
High Pressure Test	11	10 min	5000	3000
Pipe Mandrel Test				
Low Pressure	1	10 min	300	1500
High Pressure	—	10 min	10,000	1500
Total Closures	7			

Drift Test

Total Drift Time (in minutes): 13 Drift Test: Pass or Fail

Test Results

Pass/Fail: Pass DOP/NCR Ticket No: _____

Comments: _____

Tester: David Garcia Date: 04-09-2013

Certificate Number: 12 1731 /01

MESSRS.

 CAM DRILLING SYS - BEZIERS
 CAMERON FRANCE S.A.S.
 PLAINE SAINT-PIERRE
 CS620
 34535 BEZIERS CEDEX
 France

Yr Order : 4503418832 DU 19/06/12

Job : 115869 CAM DRILLING SYS - BEZIERS Quantity 1

Description of the material:

 BODY DL BOP DWG.X-163002-21-01 REV.01
 P/N 2049891-04 REV.03 - ITEM 00001
 QUENCHED & TEMPERED, ROUGH-MACHINED.
 PIECE MARKED S/N 01
 SAMPLE 2059 -

DATA COME FROM EN 10204:2005 3.1 STEEL MILL CERTIFICATE

Qty : 1

Steel grade/Standard : ASTM A 182 F 22

HEAT CHEMICAL ANALYSIS: 95658

Steel Maker: ASO SIDERURGICA

C : 0,12000	Mn : 0,49000	Si : 0,27000	P : 0,00700	S : 0,00100
Cr : 2,24000	Ni : 0,19000	Mo : 0,97000	Cu : 0,13000	Al : 0,03200
Sn : 0,00700	Nb : 0,00400	V : 0,00700	Ti : 0,00300	B : 0,00020
Co : 0,01000	Ca : 0,00090	As : 0,00600	Sb : 0,00230	N2 : 38,0000 ppm
H2 : 0,9000 ppm	O2 : 14,0000 ppm			

Notes : E.F.V.D.

Reduction ratio 10,4:1

 SPEC. QP-012040-30 Rev.01 - MS-003815 Rev.09 Dash 07 Rev.07
 MS-003803-01 Rev.04

MOD. FOC D.Q.A. 21/A

Issued on : 07/12/2012

Executive Manager Q.A.

FOC Ciscato S.p.A.

Sede legale amministrativa e stabilimento

Il stabilimento

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 Società soggetta a direzione e coordinamento di Sellink S.p.A.

 Via dell'Industria, 22
 36030 Calliano (Vicenza) - Italy
 Tel. +39 0445 739 150
 Fax +39 0445 739 165

 DEPARTMENT
 QUALITY ASSURANCE
 MOD. FOC D.Q.A.
 21/A

Yr Order : 4503418832 DU 19/06/12

 Job : **115869** CAM DRILLING SYS - BEZIER

 Quantity **1**

Description of the material:

 BODY DL BOP DWG.X-163002-21-01 REV.01
 P/N 2049891-04 REV.03 - ITEM 00001
 QUENCHED & TEMPERED, ROUGH-MACHINED.
 PIECE MARKED S/N 01
 SAMPLE 2059

MECHANICAL TEST

EN 10204 3.1

Heat : 85658

SAMPLE : 2059

Q.ty : 1

Steel grade/Standard : ASTM A 182 F 22

Tensile diameter/Way	: Dia. 12,5 Sez.122,66 Lh 50	T	
Temperature / U.M.	: T.A. N / mm ²		
Yield strength 0,2%	: Min: 517		Result: 584
Tensile Strength	: Min: 655		Result: 714
Elongation % 4D	: Min: 18		Result: 25.8
Reduction area %	: Min: 35		Result: 76
Impact test 10x10x55 / Way	: KV L		
Temperature and U.M.	: -29°C J		
Impact Test	: Min.Avg: 42 Min.Sing.: 32		Result: 114 - 112 - 128
Lateral expansion mm.	: Min: 0.38		Result: 1,4 - 1,4 - 1,5
Test standard	: ASTM A 370 - QP-012040-30 Rev.01		
Test standard	: MS-003803-01 Rev.04-MS-003815 Rev.09 Dash 07 Rev.07		
Result	: Satisfactory		

 Notes : Mechanical test taken from forging prolongation.
 No welding performed.

MOD. FOC D.Q.A. 21/A

Issued on : 07/12/2012

Executive Manager

FOC Ciscato S.p.A.

Sede legale amministrativa e stabilimento

Il stabilimento

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 36030 Caltrano (Vicenza) - Italy
 Tel. +39 0445 739 150
 Fax +39 0445 739 155

Yr Order : 4503418832 DU 19/06/12

 Job : **115869** CAM DRILLING SYS - BEZIERIS Quantity **1**

Description of the material:

 BODY DL BOP DWG.X-163002-21-01 REV.01
 P/N 2049891-04 REV.03 - ITEM 00001
 QUENCHED & TEMPERED, ROUGH-MACHINED,
 PIECE MARKED S/N 01
 SAMPLE 2059

HEAT TREATMENT

EN 10204 3.1 Heat : 85658

 Qty : 1 Steel grade/Standard : **ASTM A 182 F 22**

 Heat treatment : **Quenching**
 Heating ratio : 100°C/h max
 Temperature : 930°C ±7°C
 Holding H : 7,00
 Cooling : Water
 Batch nr. : 1439

Notes : Water temperature was less than 38°C, at the beginning of the quench and less than 49°C, at its end.

HEAT TREATMENT

EN 10204 3.1 Heat : 85658

 Qty : 1 Steel grade/Standard : **ASTM A 182 F 22**

 Heat treatment : **Tempering**
 Heating ratio : 100°C/h max
 Temperature : 660°C ±7°C
 Holding H : 11,00
 Cooling : Air
 Batch nr. : 1447

 Notes : Fixed thermocouple to furnace. (Method A)
 Furnace calibrated according to standard API 6A ANNEX M 20th Edition

 SPEC. QP-012040-30 Rev.01 - MS-003815 Rev.09 Dash 07 Rev.07
 MS-003803-01 Rev.04

MOD. FOC D.Q.A. 21/A

Issued on : 07/12/2012

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 Executive Manager
 Il stabilimento

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 Fax +39 0445 739 155

Yr Order : 4503418832 DU 19/06/12

Job : 115869	CAM DRILLING SYS - BEZIER	Quantity 1
Description of the material:		
BODY DL BOP DWG.X-163002-21-01 REV.01 P/N 2049891-04 REV.03 - ITEM 00001 QUENCHED & TEMPERED, ROUGH-MACHINED. PIECE MARKED S/N 01 SAMPLE 2059		

HARDNESS CONTROL

Heat : 85658

Q. ty : 1

Steel grade/Standard : ASTM A 182 F 22

BRINELL HARDNESS ON TEST PIECE: HBW=220-226

BRINELL HARDNESS ON THE PIECES: REQUIRED HBW 197÷237

PIECE MARKED S/N 01	HBW A1=224	HBW A2=207	HBW A3=217
	HBW A4=213	HBW A5=207	HBW A6=213
	HRB C1=93,5	HRB C2=95,5	HRB C3=94,5
	HRB C4=94,0	HRB C5=97,0	HRB C6=98,0
	HB B1=207	HB B2=210	HB B3=207
	HB B4=214	HB B5=214	HB B6=223
	HB B7=232	HB B8=232	HB B9=223

AMBIENT TEMPERATURE: +14°C

REF.NCR 200773934

 SPEC. QP-012040-30 Rev.01 - MS-003815 Rev.09 Dash 07 Rev.07
 MS-003803-01 Rev.04 - X-008065 Rev.05

MOD. FOC 500A 21/A

Issued on : 07/12/2012

Executive Manager

 QUALITY ASSURANCE
 Manager C.A.
 Dr. Roberto Alma

FOC Ciscato S.p.A.
Sede legale amministrativa e stabilimento
Il stabilimento

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**FORGIATURA
MAMÉ**

SINCE 1905

Open die forging • Machining • Heat treatments

CERTIFICATO DI COLLAUDO

*Inspection certificate / Certificat de réception
Abnahmeprüfzeugnis / Акт технического осмотра*

FORM 8B Ed. 01/2000

N° **2978.00**
REV. **00**
DATA **12/09/2012**
PAG. **1 di 8**

3.1 EN 10204/05

N° COM. INT. 1203980	N° POSIZIONI INTERNE 001	CLIENTE Customer / Client / Kunde / Номер покупателя CAMERON FRANCE S.A.S.	ORDINE Order / Commande / Bestellung / Заказа 4503366696	DATA ORDINE Date/ Datum/ Дата заказа 07/05/2012
MATERIALE / Material / Nuance / Stahlgüte / Материал Сырье A182 Gr. F 22		NORMA O SPECIFICA / Specification / Spezifikation / Спецификация MS-011284-09 REV.01 - QP-012040-30 rev. 01 - MS-003803-01 REV.03 - IN-9532 REV.O		

ITEM	QTA Qty Qte Количество	DESCRIZIONE Subject Objet Betrett Предмет	CODICE Code Code Code Код	PART NUMBER P/N	DISEGNO Drawing Plan Zeichnung чертеж	MATR. MAMÉ Identif. Mamé Repere Mamé Mamé Ident-Nr. Идентификационный	MATRICOLA CLIENTE Identification Repere de fournisseur Kunden Ident-Nr. Идентификация	COLATA Heat Coulée Schmelze Плавка	PROVA Test Probenfug Essai Проба
1	1	TOP FORGING FOR 18-3/4 10K DL T75 SP		236504-54-02-10 Rev. 03	X-163003-21-01 / 02	S398/1-1		21878	12/1460

01 **ANALISI CHIMICA DI COLATA / Ladle analysis / Analyse chimique / Chemische Analyse / ХИМИЧЕСКИЙ АНАЛИЗ ЗАГОТОВКИ** () = Analisi chimica richiesta / Required chemical analysis
Analyse chimique demandée / Erfragte chemische Zusammensetzung / Требуемый химический анализ

N° Colata Heat N° / Coulee N° Schmelze N° / Плавка номер				Dimensione grano Grain size / Grosseur du grain / Размер зерн			Rapporto di fucinatura Forging ratio / Rapport de forgeage / Пропорции ковки			ITEM	1			
21878											> 3:1			
C %	Mn %	Si %	P %	S %	Cr %	Mo %	Ni %	Al %	Sn %	Cu %	V %	Nb %	As %	
0,140	0,550	0,250	0,006	0,002	2,300	0,930	0,150	0,017	0,009	0,140	0,004	0,002	0,003	
(0,1 ÷ 0,15)	(0,3 ÷ 0,6)	(≤ 0,5)	(≤ 0,025)	(≤ 0,025)	(2 + 2,5)	(0,87 ÷ 1,13)	(≤ 0,5)			(≤ 0,35)	(≤ 0,01)			
Ca %	Sb %	N ppm	H ppm	O ppm	B %	Ti %								
0,0006	0,002	73,000	1,300	22,000	0,0005	0,002								

NOTE / Notes / Bemerkungen / Remarques / Примечания
Acier élaboré au four électrique et dégazé sous vide



ENTI COLLAUDATORI Inspection authorities / Autorités de recette / Abnahmebehörde / Контрольный орган		CERTIFICATORE Appointee of certification / Opérateur de certification Abnehmer für zeugnisse / Приемщик сертификации		DATA FIRMA Date signature / Datum Дата подписи
		Bianchi Vera		12/09/2012



Vera Bianchi
CERTIFICAZIONE



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FORM 8B Ed. 01/2000

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DATA **12/09/2012**
PAG. **2 di 8**

3.1 EN 10204/05

02 **TRATTAMENTO TERMICO / Heat treatment / Traitement thermique / Wärmebehandlung / Термическая обработка**

ITEM

1

N° IDENTIFICAZIONE Identification N° Repere N° Identifizierung N° Идентификационный номер	TRATTAMENTO TERMICO Heat treatment Traitement thermique Wärmebehandlung Термическая обработка	GRADIENTE SALITA Heating rate Vitesse de montée Anstiegsgeschwindigkeit Тепловая мощность	TEMPERATURA Temperature Température Temperatur Температура	PERMANENZA Soaking time Temps de maintien Haltezeit Время выдержки	GRADIENTE DISCESA Down rate Vitesse de descente Abstiegsgeschwindigkeit Скорость охлаждения	N° DIAGR. Diagram N° Diagramme N° Diagramm N° Диаграмма Схема
S398/1-1	T.T. - Trempe à l'eau	70 °C/h	920 °C	4 h		1097
S398/1-1	T.T. - 1ère Revenue en Eau	70 °C/h	650 °C	8 h		1098

NOTE / Notes / Bemerkungen / Remarques / Примечания

Température du bain de trempe à l'eau 40°C

Method B

ENTI COLLAUDATORI
Inspection authorities / Autorités de recette / Abnahmebehörde / Контрольный орган

CERTIFICATORE
Appointee of certification / Opérateur de certification
Abnehmer für zeugnisse / Приемщик сертификации

DATA FIRMA
Date signature / Datum
Дата подпись

Bianchi Vera

12/09/2012



Vera Bianchi
CERTIFICATION D.T.



**FORGIATURA
MAME**

SINCE 1903

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FORM 8B Ed. 01/2000

N° **2978.00**
REV. **00**
DATA **12/09/2012**
PAG. **3 di 8**

3.1 EN 10204/05

03 CARATTERISTICHE RICHIESTE / Mechanical requirements / Anforderungen / Caracteristiques demandees / Механические требования														L = Longitudinale / Longwise / Langsprobe / Продольный T = Tangenziale / Tangential test / Tangentialprobe / Тангенциальный				Q = Traverso / Crosswise / Querprobe / Измерение материала в поперечном разрезе R = Radiale / Radial / Radial / Радиальный			
N° PROVA N° Test / N° Essai / N° Probe / номер Пробы SAGGIO Specimen / Échantillon / Probemuster / Образец	DIREZ. Direction Direction Richtung Направлени е	TIPO Type Typ Тип	TEMPER. Temp. Temp. Temp. Температур а	SNERVAMENTO Yield point Limite élastique Streckgrenze Предел текучести	ROTTURA Tensile strenght Rupture Zugfestigkeit предел прочности на разрыв	ALLUNG. (%) Elongation Allongement Dehnung предел прочности на	STRIZ. (%) Red. of area Striction Kerbschlagarbeit Относительн ое сужение	TIPO RES. Impact test Résilience Kerbschlagarbeit ударная	TEMPER. Temp. Temp. Temp. Температур а	VAL. RICHIESTO Value required Val. demandees Soll-Werte Требуемый показатель	ESPAN. LATER. Expansion lateral Расширение боковой	SHARE FRAC. (%) Share fracture	DUREZZA Brinell hard. Dureté Brinell Brinellhärte Твердость по Бринеллю								
12/1460 - A11K QTC 8x8x6	L	ASTM A370						KV	-59 °C	>= 42 J	>= 0,38										
12/1460 - A12X QTC 8x8x6	L	ASTM A370						KV	-59 °C	>= 42 J	>= 0,38										
12/1460 - AT1K QTC 8x8x6	L	ASTM A370	20 °C	>= 517 MPa	>= 655 MPa	>= 18	>= 35														
12/1460 - AT2X QTC 8x8x6	L	ASTM A370	20 °C	>= 517 MPa	>= 655 MPa	>= 18	>= 35														
12/1460													207+237 HBW								

NOTE / Notes / Remarques / Bemerkungen / Примечания

TEST K= ESSAIS MECANQUES EXECUTEE' ON CONDITION DE FORNITURE

TEST X= ESSAIS MECANQUES APRES POST SOUDURE

Dimension of sppecimens:

Tension= test Ø 12,5 -usable length 50 mm - sez.122,6 mm²

Impact test= 10 x 10 x 50 - sez. 0,8 cm²

ENTI COLLAUDATORI

Inspection authorities / Autorités de recette / Abnahmebehörde / Контрольный орган

CERTIFICATORE

Appointee of certification / Opérateur de certification
Abnehmer für zeugnisse / Приемщик сертификации

DATA FIRMA

Date signature / Datum
Дата подпись

Bianchi Vera

12/09/2012



Vera Bianchi
CERTIFICATION SPT.



**FORGIATURA
MAMÉ**

SINCE 1905

Open die forging • Machining • Heat treatments

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FORM 8B Ed. 01/2000

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REV. **00**
DATA **12/09/2012**
PAG. **4 di 8**

3.1 EN 10204/05

04 GARATTERISTICHE OTTENUTE / Mechanical test results / Résultats des épreuves / Testergebnisse / Результаты механического испытания														
L = Longitudinale / Longwise / Langsprobe / Продольный T = Tangenziale / Tangential test / Tangentialprobe / Тангенциальный Q = Trasverso / Crosswise / Querprobe / Измерение материала в поперечном разрезе R = Radiale / Radial / Radial / Радиальный														
N° PROVA N° Test N° Essai N° Probe номер Пробы	DIREZ. Direction Direction Richtung Направление	TYPE Type Typ Typ Тип	TEMP. Temp. Temp. Temp. Температур	SNERVAMENTO Yield point Limite élastique Streckgrenze Предел	ROTTURA Tensile strenght Rupture Zugfestigkeit предел прочности на	ALLUNG. (%) Elongation Allongement Dehnung Удлинение растяжение	STRIZ (%) Red. of area Striction Einschnürung Относительное сужение	TIPO RES. Impact test Résilience Kerbschlag. ударная вязкость	TEMP. Temp. Temp. Temp. Температур	VAL. OTT. (J) Obtained value Valeur obtenue Ist-Wert Полученные показатели значения	ESP.LAT. (mm) Lateral Espansion Расширение Боковой	SHARE FRAC. (%) Share fracture	DUREZZA Brinell hard. Dureté Brinell Brinellhärte Твердость по Бринеллю	
12/1460 - A11K	L	ASTM A370						KV	-59 °C	52 148 49	0,6 1,9 0,5			
12/1460 - A12X	L	ASTM A370						KV	-59 °C	50 47 54	0,5 0,5 0,6			
12/1460 - AT1K	L	ASTM A370	20 °C	553 MPa	679 MPa	23,4	77							
12/1460 - AT2X	L	ASTM A370	20 °C	533 MPa	660 MPa	22,9	75,9							
12/1460													223/219 HBW	

Note / Notes / Remarques / Bemerkungen / Примечания

TEST K= ESSAIS MECANIQUES EXECUTEE' ON CONDITION DE FORNITURE
TEST X= T.T. - Post soudure au Four 638°C X 6h

ENTI COLLAUDATORI Inspection authorities / Autorités de recette / Abnahmebehörde / Контрольный орган			CERTIFICATORE Appointee of certification / Opérateur de certification Abnehmer für zeugnisse / Приемщик сертификации		DATA FIRMA Date signature / Datum Дата подпись
			Bianchi Vera		12/09/2012
			 Vera Bianchi CERTIFICATORE		



**FORGIATURA
MAME**

SINCE 1963

Open die forging • Machining • Heat treatments

CERTIFICATO DI COLLAUDO

*Inspection certificate / Certificat de réception
Abnahmeprüfzeugnis / Акт технического осмотра*

FORM 8B Ed. 01/2000

N° **2978.00**
REV. **00**
DATA **12/09/2012**
PAG. **5 di 8**

3.1 EN 10204/05

05 PROVE DI DUREZZA SUL PEZZO / Hardness test on piece / Essai de dureté sure le piece / Stück Härteprüfung / Испытание на твердость фрагмента

METODO Method / Methode / Method / метод Brinell		APPARECCHIATURA ~ CARICO APPLICATO Equipment / Appareil / Geräte ~ Appl. load / Charge appl. / Angelegte Belastung / Оборудование ~ Приложенная нагрузка HBW/10/3000/15 ~ 3000 Kg		SPECIFICA Specification / Spécification / Spezifikation / Спецификация X-008065-01 REV.01* X-008065 REV.05
ITEM	N° IDENTIFICAZIONE Identification N° / Repere N° / Identifizierung N° / Идентификационный номер	VALORE RICHIESTO Required value / Valeur demandée / Soll-Wert / Требуемый показатель	VALORE OTTENUTO Obtained value / Valeur obtenue / Ist-Wert / Полученные показатели значения	NOTE Notes / Remarques / Bemerkungen / Примечания
1	S398/1-1	207 ÷ 237 HBW	227/228/222/229/227/223/231/229/227/228 HBW	
1	S398/1-1	207 ÷ 237 HBW	235/229/235/232/229/231/233/234 HBW	

NOTE / Notes / Remarques / Bemerkungen / Примечания

La lecture de l'empreinte a été exécutée avec appareil électronique Brintronic

06 CONTROLLO VISIVO DIMENSIONALE / Visual and dimensional control / Contrôle d'aspect et dimensionnel / Sicht und Massprüfung / Проверка визуальная и размерная

ITEM 1		STATO DI FORNITURA / Surface status / Etat de surface / Oberflächenzustand / Состояние поверхности Machined / Sgrossato		
DISEGNO / Drawing / Plan / Zeichnung / Чертеж X-163003-21-01 / 02		NORMA O SPECIFICA / Specification / Spezifikation / Специфика X-008060 REV.03	RISULTATO / Results / Résultats / Ergebnisse / Результаты Voir notre NCR n.000734/ 200778668	
OPERATORE / Operator name Nom opérateur / Prüfer / Испытатель Cominotti Bortolo	QUALIFICA OPERATORE Operator qualification / Qualification opérateur / Prüferlevel / квалификация испытателя EN 473 / ISO 9712_ 2° Level	DATA COLLAUDO / Inspection date Date contrôle / Datum der Kontrolle / дата проверки 11/09/2012	 B. Cominotti It. Level EN 473 ISO 9712 UT-PT-MT	

NOTE / Notes / Remarques / Bemerkungen / Примечания

ENTI COLLAUDATORI Inspection authorities / Autorités de recette / Abnahmebehörde / Контрольный орган			CERTIFICATORE Appointee of certification / Opérateur de certification Abnehmer für Zeugnisse / Приемщик сертификации	DATA FIRMA Date signature / Datum Дата подпись
			Bianchi Vera  Vera Bianchi Certification Dept.	12/09/2012

Certificate Number : 12 1685 /01

 MESSRS.
 CAM DRILLING SYS - BEZIERS
 CAMERON FRANCE S.A.S.
 PLAINE SAINT-PIERRE
 CS620
 34535 BEZIERS CEDEX
 France

Yr Order : 4503449102 DU 13/07/12

Job : 115967 CAM DRILLING SYS - BEZIERS

Quantity : 3

Description of the material:

 PISTON 18 3/4 10 K DWG.X-336799-03 REV.01 - P/N 2349398-03 REV.01
 QUENCHED & TEMPERED, ROUGH-MACHINED.
 ITEM 00002 - PIECE MARKED S/N 00002-01
 ITEM 00003 - PIECES MARKED S/N 00003-01 & S/N 02
 SAMPLES 2113 & 2113/1 (AFTER PWHT)

DATA COME FROM EN 10204:2005 3.1 STEEL MILL CERTIFICATE

Q.ty : 3

Steel grade/Standard : ASTM A 182 F 22

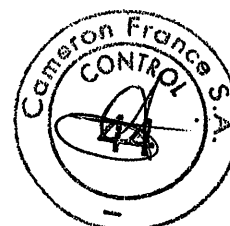
HEAT CHEMICAL ANALYSIS: 4365-12

Steel Maker : OLIVER-ACP

C : 0,12000	Mn : 0,50000	Si : 0,22000	P : 0,00600	S : 0,00200
Cr : 2,29000	Ni : 0,37000	Mo : 0,95000	Cu : 0,12000	Al : 0,03500
Sn : 0,00600	Nb : 0,00500	V : 0,01000	Ti : 0,00200	As : 0,00700
Sb : 0,00480	N2 : 70,0000 ppm	H2 : 1,4000 ppm	O2 : 18,0000 ppm	

Notes : E.F.V.D.

Reduction ratio same for both QTC and forging is 4:1

 SPEC. QP-012040-30 Rev.01 - MS-011284 Rev.03 Dash 07 Rev.01
 MS-003803-01 Rev.04


MOD. FOC DCA 21/A

Issued on : 30/11/2012

Executive Manager Q.A.

FOC Ciscato S.p.A.

Sede legale amministrativa e stabilimento

Il stabilimento

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 Società soggetta a direzione e coordinamento di Selink S.p.A.

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Certificate Number : 12 1685 /02

MESSRS.

 CAM DRILLING SYS - BEZIERS
 CAMERON FRANCE S.A.S.
 PLAINE SAINT-PIERRE
 CS620
 34535 BEZIERS CEDEX
 France

Yr Order : 4503449102 DU 13/07/12

Job : 115967 CAM DRILLING SYS - BEZIERS

Quantity : 3

Description of the material:

 PISTON 18 3/4 10 K DWG.X-336799-03 REV.01 - P/N 2349398-03 REV.01
 QUENCHED & TEMPERED, ROUGH-MACHINED.
 ITEM 00002 - PIECE MARKED S/N 00002-01
 ITEM 00003 - PIECES MARKED S/N 00003-01 & S/N 02
 SAMPLES 2113 & 2113/1 (AFTER PWHT)

HEAT TREATMENT

EN 10204 3.1 Heat : 4365-12

Q.ty : 3

Steel grade/Standard : ASTM A 182 F 22

Heat treatment	: Quenching
Heating ratio	: 100°C/h max
Temperature	: 925°C ±7°C
Holding H	: 5,00
Cooling	: Water
Batch nr.	: 1475

Notes : Water temperature was less than 38°C, at the beginning of the quench and less than 49°C, at its end.

MOD. FOC D.O.A. 2/1A

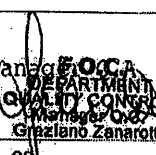
Issued on : 30/11/2012

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 Executive Manager 
 DEPARTMENT
 QUALITY CONTROL
 Graziano Zanarotti

Il stabilimento

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 36030 Caltrano (Vicenza) - Italy
 Tel. +39 0445 739 150
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HEAT TREATMENT

EN 10204 3.1 Heat : 4365-12

Qty : 3 Steel grade/Standard : ASTM A 182 F 22

Heat treatment : Tempering
Heating ratio : 100°C/h max
Temperature : 660°C ±7°C
Holding H : 7,00
Cooling : Water
Batch nr. : 1481

Notes : Fixed thermocouple to furnace. (Method A)
Furnace calibrated according to standard API 6A ANNEX M 20th Edition

SPEC. QP-012040-30 Rev.01 - MS-011284 Rev.03 Dash 07 Rev.01
MS-003803-01 Rev.04

MOD. FOC D.Q.A. 2/1A

Issued on : 30/11/2012

Executive Manager Q.A.

FOC Ciscato S.p.A.

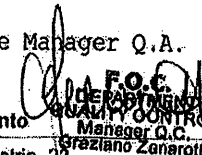
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FOC
DEPARTMENT
QUALITY CONTROL
Manager Q.C.
Graziano Zanarotti

Certificate Number : 12 1685 /03

Pag. 1

MESSRS.

 CAM DRILLING SYS - BEZIERS
 CAMERON FRANCE S.A.S.
 PLAINE SAINT-PIERRE
 CS620
 34535 BEZIERS CEDEX
 France

Yr Order : 4503449102 DU 13/07/12

Job : 115967 CAM DRILLING SYS - BEZIERS

Quantity : 3

Description of the material:

 PISTON 18 3/4 10 K DWG.X-336799-03 REV.01 - P/N 2349398-03 REV.01
 QUENCHED & TEMPERED, ROUGH-MACHINED.
 ITEM 00002 - PIECE MARKED S/N 00002-01
 ITEM 00003 - PIECES MARKED S/N 00003-01 & S/N 02
 SAMPLES 2113 & 2113/1 (AFTER PWHT)

MECHANICAL TEST

EN 10204 3.1

SAMPLE : 2113

Heat : 4365-12

Q.ty : 3

Steel grade/Standard : ASTM A 182 F 22

Tensile diameter/Way	: Dia. 12,5 Sez.122,66 Lh 50 L	
Temperature / U.M.	: T.A. N / mm ²	
Yield strength 0,2%	: Min: 517	Result: 660 -
Tensile Strength	: Min: 655	Result: 801
Elongation % 4D	: Min: 18	Result: 25
Reduction area %	: Min: 35	Result: 75.5
Impact test 10x10x55 / Way	: KV L	
Temperature and U.M.	: -29°C J	
Impact Test	: Min.Avg: 42 Min.Sing.: 32	Result: 251 - 251 - 246
Lateral expansion mm.	: Min: 0.38	Result: 2,2 - 2,1 - 2,2
Test standard	: ASTM A 370 - MS-003803-01 Rev.04	
Test standard	: QP-012040-30 Rev.01 - MS-011284 Rev.03 Dash 07 Rev.01	
Result	: Satisfactory	

 Notes : Mechanical test taken from QTC 203 X 203 X 304 mm (saw cut in two halves)
 No welding performed.

Issued on : 30/11/2012

FOC Ciscato S.p.A.

Sede legale amministrativa e stabilimento

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Executive Manager F.O.C.A.

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Certificate Number : 12 1685 /04

Pag. 1

MESSRS.

CAM DRILLING SYS - BEZIERS
CAMERON FRANCE S.A.S.
PLAINE SAINT-PIERRE
CS620
34535 BEZIERS CEDEX
France

Yr Order : 4503449102 DU 13/07/12

 Job : **115967** CAM DRILLING SYS - BEZIERS

 Quantity : **3**

Description of the material:

 PISTON 18 3/4 10 K DWG.X-336799-03 REV.01 - P/N 2349398-03 REV.01
 QUENCHED & TEMPERED, ROUGH-MACHINED.
 ITEM 00002 - PIECE MARKED S/N 00002-01
 ITEM 00003 - PIECES MARKED S/N 00003-01 & S/N 02
 SAMPLES 2113 & 2113/1 (AFTER PWHT)

HEAT TREATMENT

EN 10204 3.1 Heat : 4365-12 SAMPLE : 2113/1

Q.ty : 1 QTC Steel grade/Standard : ASTM A 182 F 22

Heat treatment	: PWHT
Heating ratio	: 100°C/h max
Temperature	: 637°C ±7°C
Holding H	: 6,00
Cooling	: In furnace
Batch nr.	: 0

Notes : Fixed thermocouple to furnace. (Method A)

 SPEC. QP-012040-30 Rev.01 - MS-011284 Rev.03 Dash 07 Rev.01
 MS-003803-01 Rev.04

MOD. FOC BOA 2/A

Issued on : 30/11/2012

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Executive Manager O.A.

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 FOC
 QUALITY CONTROL
 Manager O.C.
 Graziano Zanaroli

Certificate Number : 12 1685 /05

MESSRS.

CAM DRILLING SYS - BEZIERS
CAMERON FRANCE S.A.S.
PLAINE SAINT-PIERRE
CS620
34535 BEZIERS CEDEX
France

Yr Order : 4503449102 DU 13/07/12

 Job : **115967 CAM DRILLING SYS - BEZIERS**

 Quantity : **3**

Description of the material:

 PISTON 18 3/4 10 K DWG.X-336799-03 REV.01 - P/N 2349398-03 REV.01
 QUENCHED & TEMPERED, ROUGH-MACHINED.
 ITEM 00002 - PIECE MARKED S/N 00002-01
 ITEM 00003 - PIECES MARKED S/N 00003-01 & S/N 02
 SAMPLES 2113 & 2113/1 (AFTER PWHT)

MECHANICAL TEST
EN 10204 3.1

 Heat : **4365-12**

SAMPLE : 2113/1

Q.ty : 3

 Steel grade/Standard : **ASTM A 182 F 22**

Tensile diameter/Way	: Dia. 12,5 Sez.122,66 Lh 50 L	
Temperature / U.M.	: T.A. N / mm ²	
Yield strength 0,2%	: Min: 517	Result: 587
Tensile Strength	: Min: 655	Result: 798
Elongation % 4D	: Min: 18	Result: 27.4
Reduction area %	: Min: 35	Result: 71.3
Impact test 10x10x55 / Way	: KV L	
Temperature and U.M.	: -29°C J	
Impact Test	: Min.Avg: 42 Min.Sing.: 32	Result: 241 - 220 - 235
Lateral expansion mm.	: Min: 0.38	Result: 2,2 - 2,1 - 2,1
Test standard	: ASTM A 370 - MS-003803-01 Rev.04	
Test standard	: QP-012040-30 Rev.01 - MS-011284 Rev.03 Dash 07 Rev.01	
Result	: Satisfactory	

 Notes : Mechanical test taken from QTC 203 X 203 X 304 mm (saw cut in two halves),
 after PWHT cycle. No welding performed.

 Issued on : **30/11/2012**
FOC Ciscato S.p.A.
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F.O.C.
 DEPARTMENT
 QUALITY CONTROL
 (Signature)
 Cristiano Zanardelli

Certificate Number : 12 1685 /06

MESSRS.

CAM DRILLING SYS - BEZIER
CAMERON FRANCE S.A.S.
PLAINE SAINT-PIERRE
CS620
34535 BEZIER CEDEX
France

Yr Order : 4503449102 DU 13/07/12

Job : 115967 CAM DRILLING SYS - BEZIER

Quantity : 3

Description of the material:

PISTON 18 3/4 10 K DWG.X-336799-03 REV.01 - P/N 2349398-03 REV.01
QUENCHED & TEMPERED, ROUGH-MACHINED.
ITEM 00002 - PIECE MARKED S/N 00002-01
ITEM 00003 - PIECES MARKED S/N 00003-01 & S/N 02
SAMPLES 2113 & 2113/1 (AFTER PWHT)

HARDNESS CONTROL

Heat : 4365-12

Qty : 3

Steel grade/Standard : ASTM A 182 F 22

BRINELL HARDNESS ON THE QTC: HBW=237-237 (SAMPLE 2113)
HBW=235-237 (SAMPLE 2113/1)

BRINELL HARDNESS ON THE PIECES: REQUIRED HBW 207+237

PIECE MARKED S/N 00002-01 HBW1= HBW2=
PIECE MARKED S/N 00003-01 HBW1= HBW2=
PIECE MARKED S/N 00003-02 HBW1= HBW2=

AMBIENT TEMPERATURE: +18°C

SPEC. QP-012040-30 Rev.01 - MS-011284 Rev.03 Dash 07 Rev.01
X-008065 Rev.05

Issued on : 30/11/2012

Executive Manager OCA

FOC Ciscato S.p.A.

Sede legale amministrativa e stabilimento

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36030 Caltrano (Vicenza) - Italy
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QUALITY CONTROL
Manager O.C.
Graziano Zanarotti

 ASFO S.P.A. 36010 CHIUPPANO (VI) - ITALIA Tel.(+39)-0445-805290-Fax.(+39)-0445-805299		TEST REPORT EN 10204 3.1		No. 01126127 Rev. 0 Date: 07/07/13	
CUSTOMER: CAM DRILLING SYS BEZIERS				ORDER: 4503513678 06/09/2012	
MATERIAL: A182F22		STANDARD: /		SPECIFICATION: MS-011284-07 REV.01 QP-012040-30 REV.01	
STATE OF DELIVERY: Quenching & Tempering				ASFO JOB: 122003	

EXTENT OF MATERIAL DELIVERY

ITEM	Asfo Comm.	Qty	ARTICLE	Serial Nbr.	HEAT	TEST
00004	S00WQ7A00	1	FRG INNER CYLINDER X-031610-05 REV.01 951x463x470 P/N 2346993-03 REV.01	4503513678-0000401	4497-12	127107
00004	S00WQ7A00	1	FRG INNER CYLINDER X-031610-05 REV.01 951x463x470 P/N 2346993-03 REV.01	4503513678-0000402	4497-12	127107
00004	S00WQ7B00	1	FRG INNER CYLINDER X-031610-05 REV.01 951x463x470 P/N 2346993-03 REV.01	4503513678-0000403	4153-12	127108

HEAT TREATMENT

Type	Heat Rate	Temperature	Holding Time	Cooling
Quenching	70 °C/h	920 °C	210 min.	Water
Tempering	70 °C/h	680 °C	480 min.	Water

Bath Temperature: Before 19 °C, After 24 °C

LADLE ANALYSIS

Steelmaker: OLIFER-ACP S.P.A.

Heat: 4497-12

Method of manufacture: EAF + Fully Killed + VD

C [%]	Mn [%]	Si [%]	P [%]	S [%]	Ni [%]	Cr [%]	Mo [%]	Cu [%]	V [%]
0,14	0,55	0,18	0,0060	0,0010	0,30	2,16	0,99	0,13	0,0040

Steelmaker: OLIFER-ACP S.P.A.

Heat: 4153-12

Method of manufacture: EAF + Fully Killed + VD

C [%]	Mn [%]	Si [%]	P [%]	S [%]	Ni [%]	Cr [%]	Mo [%]	Cu [%]	V [%]
0,14	0,55	0,16	0,0050	0,0010	0,24	2,14	0,98	0,12	0,0080

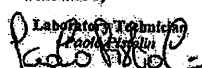
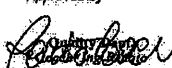
TENSILE TEST

Mechanical Test on QTC.

Test Requested	o. Prov. (mm)	Leug. (mm)	Direc.	Temp. (°C)	Rp0.2 (MPa)	RM (MPa)	A (%)	Z (%)
127107	12,50	50,00	Long	20	620,6	730,1	27,5	80,3
127108	12,50	50,00	Long	20	608,4	732,8	35,1	76,7

Mechanical Test on QTC after PWHT.



DATE	Performed by	ASFO S.P.A.	Approved by	INSPECTORS	COMPANY WITH QUALITY MANAGEMENT SYSTEM CERTIFIED BY DNV = ISO 9001:2008 =
12/02/2013					

 ASFO S.P.A. 36010 CHIUPPANO (VI) - ITALIA Tel. (+39-0445-805290-Fax: (+39-0445-805299)		TEST REPORT EN 10204 3.1	No: 01126127 Rev. 0 Page 2 of 3
CUSTOMER: CAM DRILLING SYS BEZIER		ORDER: 4503613678 06/09/2012	
MATERIAL: A182F22	STANDARD: /	SPECIFICATION: MS-011284-07 REV.01 QP-012040-30 REV.01	
STATE OF DELIVERY: Quenching & Tempering		ASFO JOB: 122003	

Test Requested	s Prov. (mm)	Long. (mm)	Dir.	Temp. (°C)	Rp0,2% (MPa)	Rt (MPa)	A (%)	Z (%)
	12,50	50,00	Long	20	min. 517,0	min. 655,0	min. 18,0	min. 35,0
127107	12,50	50,00	Long	20	593,7	715,3	24,1	77,5
127108	12,50	50,00	Long	20	583,7	691,5	31,1	72,3

Mechanical tests performed after SIMULATED PWHT:

Heating rate 70 °Ch - Holding temp. 637 °C - Holding time 360 min - Cooling rate 70 °Ch

IMPACT TEST

Mechanical Test on QTC.

Test Requested	Type KV	Dir.	Temp. (°C)	Av. Ener. (J)	Sing. Ener. (J)	Lat. Exp. (mm)
		Long	-29	min. 42	min. 32	min. 0,38
127107	KV	Long	-29	224	212-239-220	2,05-2,15-2,08
127108	KV	Long	-29	232	234-231-231	2,23-2,18-2,18

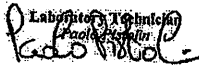
Mechanical Test on QTC after PWHT.

Test Requested	Type KV	Dir.	Temp. (°C)	Av. Ener. (J)	Sing. Ener. (J)	Lat. Exp. (mm)
		Long	-29	min. 42	min. 32	min. 0,38
127107	KV	Long	-29	260	259-252-269	2,38-2,38-2,55
127108	KV	Long	-29	270	257-282-270	2,42-2,63-2,55

Mechanical tests performed after SIMULATED PWHT:

Heating rate 70 °Ch - Holding temp. 637 °C - Holding time 360 min - Cooling rate 70 °Ch

HARDNESS TEST

DATE	Performed by	ASFO S.P.A.	Approved by	INSPECTORS	COMPANY WITH QUALITY MANAGEMENT SYSTEM CERTIFIED BY IRV = ISO 9001:2008 =
12/02/2013					

MAGNETIC PARTICLE / PENETRANT TESTING REPORT
RAPPORT DE CONTROLE MAGNETOSCOPIE / RESSUAGE

N° 13 009

PART DETAILS / REFERENCE PIECE			
PART NUMBER N° DE PIECE 2163587-23	REVISION 02	DESCRIPTION 18-3/4" 10000CX-18 "CRA" 18.75 BORE	PURCHASE ORDER - ITEM ORDRE D'ACHAT - ITEM 4503520703-02
QUANTITY QUANTITE 1	SERIAL NUMBER OF PART N° DE SÉRIE 112539069-01	INSPECTION REFERENCE DRAWING + REVISION LEVEL PLAN D'INSPECTION + INDICE DE REVISION X-103884-23-03	PRODUCTION ORDER N° DE FABRICATION 112539069
MATERIAL SPECIFICATION SPECIFICATION MATIERE 1			WELD SPECIFICATIONS SPECIFICATIONS SOUDURE 1
EXAMINATION REQUIREMENTS / EXIGENCES DE CONTROLE			
NDE METHOD METHODE CND LIQUID PENETRANT RESSUAGE	TEST PROCEDURE + REVISION PROCEDURE DE TEST + REVISION QP-010030-51 - 04	ACCEPTANCE CRITERIA CRITERE D'ACCEPTATION RELEVANT INDICATIONS : 1/16 INCH (1.6mm) ACCEPTANCE CRITERIA : 1/8 INCH (3.2mm)	
MAGNETIC PARTICLE MAGNETOSCOPIE	1	1	
☒ LIQUID PENETRANT DETAILS / CONDITIONS D'EXAMEN PAR RESSUAGE ☒ MAGNETIC PARTICLE DETAILS / CONDITIONS D'EXAMEN PAR MAGNETOSCOPIE			
DESCRIBE EQUIPMENT USED / DESCRIPTION DU MATERIEL UTILISE Thermomètre N° TH008 étalonné le 20/04/11 Luxmètre N° MD046 étalonné le 07/12/12 Plaquelette Runcheck : Résultat OK USED CONSUMABLE TYPE / TYPE DE CONSOMMABLES UTILISES : Pénétrant aérosol ARDROX 9VF2 lot : 0900035389 péremption : 07/13 Révélateur aérosol ARDROX NQ1 lot : 0900040661 péremption : 02/15 Rinçage à l'eau + chiffons secs blancs non pelucheux LIGHTING / ECLAIREMENT : Naturel et éclairage d'appoint : 1200 LUX		COIL TURNS / NOMBRE DE TOURS DU SOLENOÏDE BATH CONCENTRATION / CONCENTRATION DE LA LIQUEUR MAGNETIQUE 1	☒ VISIBLE ☐ FLUORESCENT PARTS: T° / T° PIECE: 19°C MAGNETIZING CURRENT / COURANT : 1 ROUGHNESS / RUGOSITE : Pièce de tour Ra 1.6
☒ ACCEPTED WITHOUT INDICATIONS ACCEPTE SANS INDICATIONS	☐ ACCEPTED NON REJECTABLE INDICATION SHOWN BELOW ACCEPTE AVEC DES INDICATIONS VOIR BAS DE PAGE	☐ NOT ACCEPTED FOR INDICATIONS SHOWN BELOW NON ACCEPTE VOIR INDICATIONS BAS DE PAGE	NCR N° / N° NCR
EXTENT OF EXAMINATION / RESULTAT DU CONTROLE			APPROVALS
PROVIDE SKETCH OR TEXT AS NECESSARY TO IDENTIFY COVERAGE OF NDE / Fournir un schéma ou des explications nécessaires pour Identifier la zone contrôlée par CND. REPORT LOCATIONS OF ALL NON-REJECTABLE AND REJECTABLE INDICATIONS / Identifier l'emplacement de toutes les indications acceptables ou non. API wetted surface and seal surface, overlay surfaces			INSPECTOR NAME AND SIGNATURE NOM ET SIGNATURE DU CONTRÔLEUR JAMBON JULIEN B02-014008  DATE: 21/03/13 LEVEL / NIVEAU : 2

N°51/13

PART NUMBER N° DE PIECE		REVISION	PART DETAILS / REFERENCE PIECE DESCRIPTION		PURCHASE ORDER - ITEM ORDRE D'ACHAT - ITEM
2011698-01-02		04	TOP DL BOP 18-3/4" 10K STUDD		4503580647-01
QUANTITY QUANTITE	SERIAL NUMBER OF PART N° DE SERIE		INSPECTION REFERENCE DRAWING + REVISION LEVEL PLAN D'INSPECTION + INDICE DE REVISION		PRODUCTION ORDER N° DE FABRICATION
1	112567412-01		X-024666-08 Rev A1		112567412
MATERIAL SPECIFICATION SPECIFICATION MATIERE		HEAT NUMBER N° DE COULEE	HEAT TREAT N° DE TRAITEMENT THERMIQUE	REPERE	WELD SPECIFICATIONS SPECIFICATIONS SOUDURE
MS-003815-05 rev 05		HN 21878	HT 12/1460		

EXAMINATION REQUIREMENTS / EXIGENCES DE CONTROLE		
NDE METHOD METHODE CND	TEST PROCEDURE + REVISION PROCEDURE DE TEST + REVISION	ACCEPTANCE CRITERIA CRITERE D'ACCEPTATION
LIQUID PENETRANT RESSUAGE	X-8062 Rev 16 X-8060 Rev 05	QP -010030-51 Rev 05
MAGNETIC PARTICLE MAGNETOSCOPIE		

LIQUID PENETRANT DETAILS / CONDITIONS D'EXAMEN PAR RESSUAGE		
MAGNETIC PARTICLE DETAILS / CONDITIONS D'EXAMEN PAR MAGNETOSCOPIE		

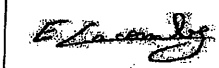
DESCRIBE EQUIPMENT USED / DESCRIPTION DU MATERIEL UTILISE :		COIL TURNS / NOMBRE DE TOURS DU SOLENOÏDE :	☒ VISIBLE ☐ FLUORESCENT
1- Combiné luxmètre / radiomètre pollux N° de série 251 (val. 10/13) 2- Thermomètre hanna hi 98509 lot 31786 (val. 10/13)			PARTS T° / T° PIÈCES 20°
USED CONSUMABLE TYPE / TYPE DE CONSOMMABLES UTILISES : -Solvant de dégraissage Ardrex 9PR5 lot 900030556 (per. 10/13) -Pénétrant Ardrex 9VF2 lot 0900029417 (per 10/13) -Révélateur Ardrex 9D1 lot 0900027975 (per 10/13) -Elimination de l'excès de pénétrant par lavage à l'eau pression inférieur à 2 bars , séchage par chiffon propre, sec et non pelucheux + vérification du bruit de fond		BATH CONCENTRATION / CONCENTRATION DE LA LIQUEUR MAGNETIQUE :	MAGNETIZING CURRENT / COURANT :
LIGHTING / ECLAIREMENT : lumière blanche intensité 1000 LUX avec complément de lampe			ROUGHNESS / RUGOSITE 1.6
☒ ACCEPTED WITHOUT INDICATIONS ACCEPTÉ SANS INDICATIONS	☐ ACCEPTED NON REJECTABLE INDICATION SHOWN BELOW ACCEPTÉ AVEC DES INDICATIONS VOIR BAS DE PAGE	☐ NOT ACCEPTED FOR INDICATIONS SHOWN BELOW NON ACCEPTÉ VOIR INDICATIONS BAS DE PAGE	NCR N° / N° NCR

PROVIDE SKETCH OR TEXT AS NECESSARY TO IDENTIFY COVERAGE OF NDE / Fournir un schéma ou des explications nécessaires pour identifier la zone contrôlée par CND.	INSPECTOR NAME AND SIGNATURE NOM ET SIGNATURE DU CONTROLEUR
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All well fluid wetted and sealing surfaces

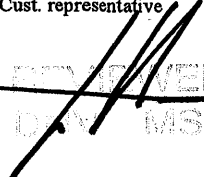


Lacombe Eric

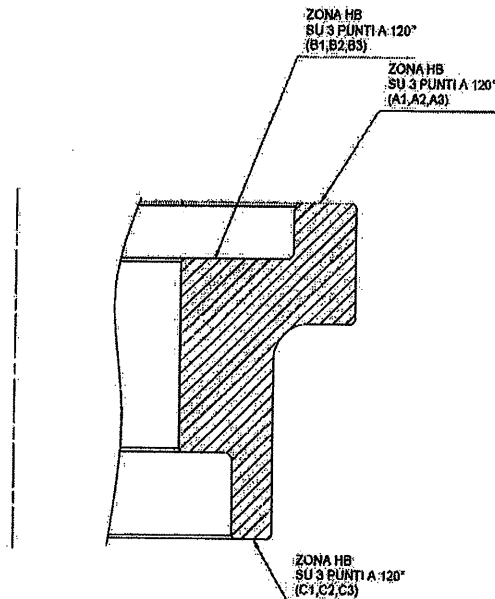


DATE: 16/05/2013

LEVEL / NIVEAU : cofrend 2 (B02-008029)

Meca Coating Industry 2, avenue de la Devèze 34500 BÉZIERS Tél: (33) 05 34 66 72 60 Fax: (33) 05 61 27 19 09		LIQUID PENETRANT INSPECTION CONTROLE NON DESTRUCTIF - RESSUAGE COLORE		Numéro PT / 9203/3	
CLIENT / Customer		CAMERON France		COMMANDE/Order : 4503551666 Pst/Item 03	
DESIGNATION DE L'ARTICLE Description		PISTON 18,3/4" 10K DL BOP			
NUMERO D'ARTICLE Part number		2349398-01		rév 05	
PLAN QUALITE Quality plan		QP-010030-51		rév : 04	
SPECIFICATION MATIERE / ms		MS-003815-07		rév : 09	
COULEE / Heat		HN/4365-12 HT/2113 SN/112572130-1			
CRITERES D'ACCEPTATION Criteria accepted		X-008062		rév : 15	
CONTROLEUR / inspector		RIGOUSTE G.			
CERTIFICATION / Certification		COFREND		N°: 14752	
NIVEAU / Level		II		Validity : 20/04/2016	
DEGRAISSANT SURFACES Clean surfaces		BABB-CO Type N 120		Method : AEROSOL / SPRAY Time : 5 mn Batch : 2012/2	
PENETRANT COLORE Color contrast penetrant		BABB-CO Type DP-55		Method : BRUSH / WASHABLE METHOD Time : 20 mn Batch : 9628	
REVELATEUR / Developer		BABB-CO Type D-100		Method : AEROSOL / SPRAY Time : 10 mn Batch : 10212	
QUANTITE TESTEE Tested qty		1			
QUANTITE ACCEPTEE Accepted qty		1			
QUANTITE A RETOUCHER Recordable qty		0			
QUANTITE REFUSEE Rejected qty		0			
PIECES N° / Parts # :		SN/112572130-1			
RESULTATS / Comments :		PIECES AVEC INDICATIONS ACCEPTABLES SVT CRITERES D'ACCEPTATIONS CONTRÔLE SURFACES MOUILLEES A 100% / CONTROL WET SURFACES AT 100% CONTRÔLE SURFACES RECHARGEES A 100% / CONTROL WELDED SURFACES AT 100% Contrôle Effectué Après Usinage Checking Realized After Machining			
RESPONSABLE CONTRÔLE Inspector supplier Date : 21/05/2013 Visa : Guillaume RIGOUSTE 		RESPONSABLE QUALITE Supervisor Date : 21/05/2013 Visa : Christophe ROUQUET 		CONTROLE CLIENT Cust. representative Date : Visa : 	

 ASFO S.P.A. 36010 CHIUPPANO (VI) - ITALIA Tel.(+39-0445-805290-Fax.(+39-0445-805299)		TEST REPORT EN 10204 3.1		No. 01126127 Rev.0 Page 2 of 3
CUSTOMER: CAM DRILLING SYS BEZIERIS			ORDER: 4503513678 06/09/2012	
MATERIAL: A182F22		STANDARD: /		SPECIFICATION: MS-011284-07 REV.01 QP-012040-30 REV.01
STATE OF DELIVERY: Quenching & Tempering			ASFO JOB: 122003	



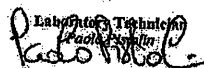
HARDNESS BRINELL on PIECES on 3 EQUI-SPACED POINTS.

Test Requested	Type HBW	Position A1,A2,A3	Range HBW (A1,A2,A3) 207-237
4503513678-0000401	HBW	A1,A2,A3	223-223-223
4503513678-0000402	HBW	A1,A2,A3	212-212-212
4503513678-0000403	HBW	A1,A2,A3	217-207-207

HARDNESS BRINELL on PIECES on 3 EQUI-SPACED POINTS.

Test Requested	Type HBW	Position B1,B2,B3	Range HBW (B1,B2,B3) 207-237
4503513678-0000401	HBW	B1,B2,B3	217-217-217
4503513678-0000402	HBW	B1,B2,B3	212-212-212
4503513678-0000403	HBW	B1,B2,B3	207-207-207

HARDNESS BRINELL on PIECES on 3 EQUI-SPACED POINTS.

DATE	Performed by	ASFO S.P.A.	Approved by	INSPECTORS	COMPANY WITH QUALITY MANAGEMENT SYSTEM CERTIFIED BY DNV = ISO 9001:2008 =
12/02/2013					

 ASFO S.P.A. 36010 CHIUPPANO (VI) - ITALIA Tel.(+39-0445-805290-Fax.(+39-0445-805299)		TEST REPORT EN 10204 3.1	No. 01126127 Rev. 0 Page 4 of 5
CUSTOMER: CAM DRILLING SYS BEZIER		ORDER: 4503513678 06/09/2012	
MATERIAL: A182F22	STANDARD: /	SPECIFICATION: MS-011284-07 REV.01 QP-012040-30 REV.01	
STATE OF DELIVERY: Quenching & Tempering		ASFO JOB: 122003	

Test Requested	Type HBW	Position C1,C2,C3	Range HBW (C1,C2,C3) 207-237
4503513678-0000401	HBW	C1,C2,C3	229-229-229
4503513678-0000402	HBW	C1,C2,C3	223-223-223
4503513678-0000403	HBW	C1,C2,C3	229-223-223

Hardness Test performed on QTC.

Test Requested	Type HB	Range HB 207-237
127107	HB	217-217
127108	HB	214-214

Hardness Test performed on QTC after PWHT.

Test Requested	Type HB	Range HB 207-237
127107	HB	207-207
127108	HB	207-207

Mechanical tests performed after SIMULATED PWHT:

Heating rate 70 °Ch - Heating rate 70 °Ch - Holding temp. 637 °C - Holding temp. 637 °C - Holding time 360 min - Hold ing.time 360 min - Cooling rate 70 °Ch - Cooling rate 70 °Ch

REDUCTION TEST

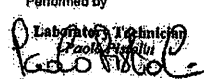
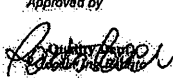
REDUCTION RATIO:

Required values ≥ 3.00

Obtained values: Test 127107(3,31), Test 127108(3,31)

NOTES:

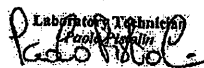
- Visual test: Positive result.
 - QTC obtained from separated test bar 8"x8"x12".
 - Test Specimen taken at T/2xT/4.
 - Impact Test Specimen Dimensions: 10x10 mm.
 - Hardness Test on pieces is performed using stationary Brinell Machine or King Portable HB 3000 according to locations showed on Cameron Drawings, as far as practicable (limitations given by Stationary Brinell Machine and King Portable tester).
 - Heat Treatment performed according to Method A described in Cameron Specifications:
- Heat Treatment Monitoring Method: Furnaces uniformly heated, equipped with No.2 thermocouples positioned at mid length of the sides, one per each side.

DATE	Performed by	ASFO S.P.A.	Approved by	INSPECTORS	COMPANY WITH QUALITY MANAGEMENT SYSTEM CERTIFIED BY DNV = ISO 9001:2008 =
12/02/2013					

 ASFO S.P.A. 36010 CHIUPPANO (VI) - ITALIA Tel. (+)39-0445-805290-Fax. (+)39-0445-805299		TEST REPORT EN 10204 3.1		No. 01126127 Rev. 0 Page 1 of 1
CUSTOMER: CAM DRILLING SYS BEZIERIS			ORDER: 4503513678 06/09/2012	
MATERIAL: A182F22	STANDARD: /		SPECIFICATION: MS-011284-07 REV.01 QP-012040-30 REV.01	
STATE OF DELIVERY: Quenching & Tempering			ASFO JOB: 122003	

Soak times start when all furnace thermocouples are at the Temperature stated in the certificate and within the limits required in API 6A.

- Batch Numbers: Quenching: SMTF/199484, Tempering: SMTF/19977

DATE 12/02/2013	Performed by 	ASFO S.P.A.	Approved by 	INSPECTORS	COMPANY WITH QUALITY MANAGEMENT SYSTEM CERTIFIED BY DNV = ISO 9001:2008 =
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CONSTRUCCIONES MECANICAS
ENDAKIT S. L.

NON DESTRUCTIVE TESTING REPORT

INFORME DE ENSAYO NO DESTRUCTIVO

Nº 142-13 Pag 1 de 1

PART DETAILS / DETALLES PIEZA

PART NUMBER CODIGO PIEZA Y REVISION 2346993-04 Rev : 03		CLIENTE CAMERON FRANCE	DESCRIPTION DESCRIPCION PIEZA INNER CYLINDER, 18-3/4	PURCHASE ORDER - ITEM Nº PEDIDO CLIENTE - ITEM 4503679634-2
QUANTITY CANTIDAD 1	SERIAL NUMBER OF PART Nº DE SERIE 112663298	INSPECTION REFERENCE DRAWING PLANO DE INSPECCION X-024667-06 Rev B3 QP-010030-51 Rev 04		PRODUCTION ORDER ORDEN DE FABRICACION 112663298
MATERIAL SPECIFICATION ESPECIFICACION MATERIAL F22		HEAT NUMBER Nº DE COLADA HN 4153-12	HEAT TREAT Nº DE TRATAMIENTO TERMICO HT 127108	WELD SPECIFICATIONS ESPECIFICACIONES SOLDADURA

EXAMINATION REQUIREMENTS / REQUISITOS INSPECCION

NDE METHOD METODO END	TEST PROCEDURE + REVISION PROCEDIMIENTO INSPECCION + REVISION	ACCEPTANCE CRITERIA CRITERIO DE ACEPTACIÓN
LIQUID PENETRANT LIQUIDOS PENETRANTES	X-008062 Rev 16	QP-010030-51 Rev 04
MAGNETIC PARTICLE PARTICULAS MAGNETICAS		
ULTRASONIC ULTRASONIDOS		

☒ LIQUID PENETRANT DETAILS / CONDICIONES DE INSPECCION LIQUIDOS PENETRANTES

☐ MAGNETIC PARTICLE DETAILS / CONDICIONES DE INSPECCION PARTICULAS MAGNETICAS

DESCRIBE EQUIPMENT USED / DESCRIPCION EQUIPOS UTILIZADOS: USED CONSUMMABLES TYPE / TIPO DE CONSUMIBLES: ARDROX 9VF2 LIQUIDO PENETRANTE ARDROX 9PR5 DISOLVENTE ARDROX 9D1B REVELADOR	COIL TURNS / NOMBRE DE TOURS DU SOLENOÏDE : BATH CONCENTRATION / CONCENTRACION MEZCLA PARTICULAS : LIGHTING / LUZ :	☒ VISIBLE ☐ FLUORESCENT PARTS T° / T° PIEZA : 20° c MAGNETIZING CURRENT / CORRIENTE : ROUGHNESS / RUGOSIDAD : MACHINED NCR Nº / N° NCR
☒ ACCEPTED NO INDICATIONS ACEPTABLE SIN INDICACIONES	☐ ACCEPTED NON REJECTABLE INDICATION SHOWN BELOW ACEPTABLE CON INDICACIONES MOSTRADAS ABAJO	☐ NOT ACCEPTED FOR INDICATIONS SHOWN BELOW NO ACEPTABLE CON INDICACIONES MOSTRADAS ABAJO

EXTENT OF EXAMINATION / RESULTADO DE INSPECCION

PROVIDE SKETCH OR TEXT AS NECESSARY TO IDENTIFY COVERAGE OF NDE / INCLUIR CROQUIS O EXPLICACION NECESARIA PARA IDENTIFICAR EL AREA INSPECCIONADA
REPORT LOCATIONS OF ALL NON REJECTABLE AND REJECTABLE INDICATIONS / IDENTIFICAR LA LOCALIZACION DE LAS INDICACIONES ACEPTABLES O NO ACEPTABLE

EXTENT OF EXAMINATION : WETTED SURFACES, SEAL SURFACES ACCORDING TO X-024667-06 Rev B3

NO INDICATIONS FOUND. ACCEPTABLE

APPROVAL / APROBACION

INSPECTOR NAME
NOMBRE : J.L.O.

DATE / FECHA: 07/05/2013

LEVEL / NIVEL : SUPERVISOR FORMACION NIVEL II D-A-005700-PT-2-MS-0

 ASFO S.P.A. 36010 CHIUPPANO (VI) - ITALIA Tel. (+39) 0445-805290-Fax. (+39) 0445-805299		TEST REPORT EN 10204 3.1		No. 01126677 Rev. 0 Page 1 of 2	
CUSTOMER: CAM DRILLING SYS BEZIERIS			ORDER: 4503515336 07/09/2012		
MATERIAL: AISI4130		STANDARD: /		SPECIFICATION: MS-011272-04 REV.02 QP-012040-30 REV.01	
STATE OF DELIVERY: Quenching & Tempering			ASFO JOB: 122012		

EXTENT OF MATERIAL DELIVERY

ITEM	Asfo Comm.	Qty	ARTICLE	Serial Nbr.	HEAT	TEST
00003	S00WRCA00	1	Out Cylinder X-162900-01 REV.07 1344x993x200 P/N 2245102-00-72 REV.01	4503515336-00003101	208631	127674
00003	S00WRCA00	1	Out Cylinder X-162900-01 REV.07 1344x993x200 P/N 2245102-00-72 REV.01	4503515336-00003102	208631	127674

HEAT TREATMENT

Type	Heat Rate	Temperature	Holding Time	Cooling
Quenching	70 °C/h	880 °C	240 min.	Water
Tempering	70 °C/h	650 °C	360 min.	Calm Air

Bath Temperature: Before 20 °C, After 24 °C



LADLE ANALYSIS

Steelmaker: ACCIAIERIE VENETE S.P.A.

Heat: 208631

Method of manufacture: EAF, Fully Killed, VD

C [%]	Mn [%]	Si [%]	P [%]	S [%]	Ni [%]	Cr [%]	Mo [%]
0,29	0,75	0,27	0,0130	0,0070	0,37	1,12	0,22

TENSILE TEST

Mechanical Test on QTC after QT

Test Requested	d Prov. (mm)	Leng. (mm)	Dirac.	Temp. (°C)	Rp0.2% (MPa)	R (MPa)	A (%)	Z (%)
127674	12,50	50,00	Long	20	min. 517,0	min. 655,0	min. 18,0	min. 35,0
					642,5	783,2	23,7	67,4

Mechanical Test on QTC after QT+PWHT

Test Requested	d Prov. (mm)	Leng. (mm)	Dirac.	Temp. (°C)	Rp0.2% (MPa)	R (MPa)	A (%)	Z (%)
127674	12,50	50,00	Long	20	min. 517,0	min. 655,0	min. 18,0	min. 35,0
					605,1	749,5	22,6	66,1

Mechanical tests performed after SIMULATED PWHT:

Heating rate 0 °C/h - Holding temp. 637 °C - Holding time 360 min - Cooling rate 0 °C/h

DATE	Performed by	ASFO S.P.A.	Approved by	INSPECTORS	COMPANY WITH QUALITY MANAGEMENT SYSTEM CERTIFIED BY DNV = ISO 9001:2008 =
14/12/2012					

 ASFO S.P.A. 36010 CHIUPPANO (VI) - ITALIA Tel. (+39)-0445-805290-Fax. (+39)-0445-805299		TEST REPORT EN 10204 3.1		NO. 01126677 Rev. 0 Page 2 of 2
CUSTOMER: CAM DRILLING SYS BEZIERIS			ORDER: 4503515336 07/09/2012	
MATERIAL: AISI4130		STANDARD: /		SPECIFICATION: MS-011272-04 REV.02 QP-012040-30 REV.01
STATE OF DELIVERY: Quenching & Tempering			ASFO JOB: 122012	

IMPACT TEST

Mechanical Test on QTC after QT

Test Requested	Type KV	Dir. Long	Temp. [°C]	Av. Ener. [J] min. 42	Sing. Ener. [J] min. 33	Lat. Exp. [mm] F.I.
127674	KV	Long	-59	110	110-108-112	1,18-1,12-1,21

Mechanical Test on QTC after QT+SPWHT

Test Requested	Type KV	Dir. Long	Temp. [°C]	Av. Ener. [J] min. 42	Sing. Ener. [J] min. 33	Lat. Exp. [mm] min. 0,38
127674	KV	Long	-59	135	148-166-152	1,54-1,72-1,60

Mechanical tests performed after SIMULATED PWHT:

Heating rate 0 °Ch - Holding temp. 637 °C - Holding time 360 min - Cooling rate 0 °Ch

HARDNESS TEST

Hardness Test on QTC after QT

Test Requested	Type HB	Range HB 207-237
127674	HB	230-230

Hardness Test on Pieces:

Test Requested	Type HB	Range HB 207-237
4503515336-00003V01	HB	229
4503515336-00003V02	HB	235

Hardness Test on QTC after QT+SPWHT

Test Requested	Type HB	Range HB 207-237
127674	HB	215-218

Mechanical tests performed after SIMULATED PWHT:

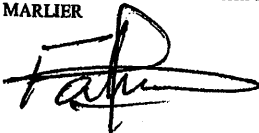
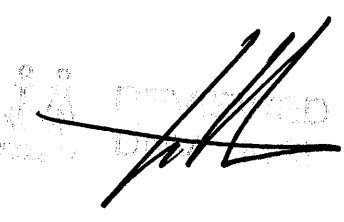
Heating rate 0 °Ch - Holding temp. 637 °C - Holding time 360 min - Cooling rate 0 °Ch

DATE	Performed by	ASFO S.P.A.	Approved by	INSPECTORS	COMPANY WITH QUALITY MANAGEMENT SYSTEM CERTIFIED BY DNV = ISO 9001:2008 =
14/12/2012					

MAGNETIC PARTICLE / PENETRANT TESTING REPORT

RAPPORT DE CONTROLE MAGNETOSCOPIE / RESSUAGE

N° C130163 n°1 finition ZR + ZM & ZE zones rechargées + zones mouillées & étanchéité matière de base

PART DETAILS / REFERENCE PIECE			
PART NUMBER N° DE PIECE 2346995-06	REVISION 02	DESCRIPTION outer cylinder head, 18 - ¾ 10K DL BOP	PURCHASE ORDER - ITEM ORDRE D'ACHAT - ITEM 4503697651 - 00002
QUANTITY 1	SERIAL NUMBER OF PART N° DE SERIE 112677723 - 1	INSPECTION REFERENCE DRAWING + REVISION LEVEL PLAN D'INSPECTION + INDICE DE REVISION X-24671-06 rev A2	PRODUCTION ORDER N° DE FABRICATION 112677723
MATERIAL SPECIFICATION SPECIFICATION MATIERE MS-011272-04 rev 03 selon commande			WELD SPECIFICATIONS SPECIFICATIONS SOUDURE WS-001423-05 rev01 selon commande
EXAMINATION REQUIREMENTS / EXIGENCES DE CONTRÔLE			
NDE METHOD METHODE CND	TEST PROCEDURE + REVISION PROCEDURE DE TEST + REVISION	ACCEPTANCE CRITERIA CRITERE D'ACCEPTATION	
LIQUID PENETRANT RESSUAGE	X008062 rev15	QP-10030-51 rev04	
MAGNETIC PARTICLE MAGNETOSCOPIE			
X LIQUID PENETRANT DETAILS / CONDITIONS D'EXAMEN PAR RESSUAGE			
MAGNETIC PARTICLE DETAILS / CONDITIONS D'EXAMEN PAR MAGNETOSCOPIE			
DESCRIBE EQUIPMENT USED / DESCRIPTION DU MATERIEL UTILISE : Ressuage effectué avec produits ci-dessous, mesure lumière prise avec appareils ci-dessous. USED CONSUMABLE TYPE / TYPE DE CONSOMMABLES UTILISES : Dégraissant BabbCo N120 lot 9112 péremption 06/2016 Pénétrant BabbCo DP55 lot 4410/2 péremption 03/2014 Révélateur BabbCo D100 lot 16710 péremption 01/2015 LIGHTING / ECLAIREMENT : Lampe. Mesures avec luxmètre / radiomètre TKA/PKM n° série 081123 (Marlier n° MT LX-RM002)		COIL TURNS / NOMBRE DE TOURS DU SOLENOÏDE : BATH CONCENTRATION / CONCENTRATION DE LA LIQUEUR MAGNETIQUE :	X VISIBLE ☐ FLUORESCENT PARTS T° / T° PIECE : 21°C MAGNETIZING CURRENT / COURANT : ROUGHNESS / RUGOSITE : Zones ext. D + pente avec Ra1.6µ Zones int. avec Ra3.2µ
X ACCEPTED WITHOUT INDICATIONS ACCEPTE SANS INDICATIONS	☐ ACCEPTED NON REJECTABLE INDICATION SHOWN BELOW ACCEPTE AVEC DES INDICATIONS VOIR BAS DE PAGE	☐ NOT ACCEPTED FOR INDICATIONS SHOWN BELOW NON ACCEPTE VOIR INDICATIONS BAS DE PAGE	NCR N° / N° NCR
EXTENT OF EXAMINATION / RESULTAT DU CONTRÔLE			APPROVALS
PROVIDE SKETCH OR TEXT AS NECESSARY TO IDENTIFY COVERAGE OF NDE / Fournir un schéma ou des explications nécessaires pour identifier la zone contrôlée par CND. REPORT LOCATIONS OF ALL NON REJECTABLE AND REJECTABLE INDICATIONS / Identifier l'emplacement de toutes les indications acceptables ou non. Pièce conforme sans indications notables.			INSPECTOR NAME AND SIGNATURE NOM ET SIGNATURE DU CONTROLEUR Nom / Prénom : M. Abdelwahad FAHIM / Sté MARLIER  DATE: le 26 avril 2013 LEVEL / NIVEAU : Cofrend EN473 niv 2 en PT  Page 1/1

 ASFO S.P.A. 36010 CHIUPPANO (VI) - ITALIA Tel: (+39) 0445-805290 - Fax: (+39) 0445-805299		TEST REPORT EN 10204 3.1		No. 01126677 Rev. 0 Page 3 of 3	
CUSTOMER: CAM DRILLING SYS BEZIERIS				ORDER: 4503515336 07/09/2012	
MATERIAL: AISI4130		STANDARD: /		SPECIFICATION: MS-011272-04 REV.02 QP-012040-30 REV.01	
STATE OF DELIVERY: Quenching & Tempering				ASFO JOB: 122012	

REDUCTION TEST

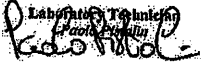
REDUCTION RATIO:

Required values ≥ 3.00

Obtained values: Test 127674(8,42)

NOTES:

- Visual test: Positive result.
 - QTC obtained from the prolongation of production part.
 - Test Specimen taken at T/2xT/4.
 - Impact Test Specimen Dimensions: 10x10 mm.
 - Hardness Test on pieces is performed using stationary Brinell Machine or King Portable HB 3000 according to locations showed on Cameron Drawings, as far as practicable (limitations given by Stationary Brinell Machine and King Portable tester).
 - Heat Treatment performed according to Method A described in Cameron Specifications:
- Heat Treatment Monitoring Method: Furnaces uniformly heated, equipped with minimum No.2 thermocouples positioned at mid length of the sides, one per each side.
- Soak times start when all furnace thermocouples are at the Temperature stated in the certificate and within the limits required in API 6A.
- Batch Numbers: Quenching: SMTF/20055, Tempering: SMTF/20081

DATE	Performed by	ASFO S.P.A.	Approved by	INSPECTORS	COMPANY WITH QUALITY MANAGEMENT SYSTEM CERTIFIED BY DNV = ISO 9001:2008 =
14/12/2012					

Inspection Certificate

Quality Control Department

N° 12300 / 12 REV.0 Date 20/03/2013

Purchaser:

GAMERON FRANCE S.A.
PLAINE SAINT PIERRE - CS 620
34535 BEZIERS CEDEX - FRANCE

Order No.:

4503600160

Certificate type: EN 10204 ed. MARCH 2005

☐ 2.2 ☒ 3.1 ☐ 3.2

SIDERFORGE job No.:

123269

Melting practice:

☒ E.F.V.D. ☐ E.F. ☐ AOD ☐ VOD

CHEMICAL ANALYSIS / LADLE ANALYSIS

MATERIAL: AISI 4130

HEAT: 025960

SUPPLIER: NLMK Verona S.p.A.

C	Mn	Si	Ni	Cr	S	P	Al	Cu	Mo	Ti	V	Nb	N	H	B			
%	%	%	%	%	%	%	%	%	%	%	%	%	%	ppm	%			
0,294	0,583	0,21	0,12	1,03	0,0009	0,008	0,021	0,13	0,216	0,01	0,004	0,001	0,0041	1	0,0003			

C.E. (Long) =

HEAT TREATMENT

TYPE	TEMP °C	HOURS	COOLING	TYPE	TEMP °C	HOURS	COOLING
QUENCHING	860	7	WATER				
TEMPERING	670	8,30	AIR				

MECHANICAL TESTS

		MPa	MPa	MPa	%	%	Dir.	Type	Temp °C	Avr/Min	J	Min	Max	
FROM PIECE	☐	MIN	655	517		18	35	TAN	KV	-59	42	33	207	237
FROM QTC	☒	MAX												

Treated with the PCs

OBTAINED

N° TEST	DIM	SECT.	LENGTH	TEMP	DIR	UTS	YS 0,2	YS	EL	RA	IMPACT TEST				HB on pieces	
	mm	mm	mm	°C		MPa	MPa	MPa	%	%	Dir.	Type	Temp °C	JOULE	Min	Max
7183	12,50	122,65	50,00	+20	TAN	709	546		28,0	75,4	TAN	KV	-59	178	210	179
7183P	12,50	122,65	50,00	+20	TAN	703	558		27,6	75,4	TAN	KV	-59	188	172	185

OUR CUSTOMER

DESCRIPTION

DRAWING

QUANTITY

ITEM	ITEM	DESCRIPTION	DRAWING	QUANTITY
1	from 1 to 1	2245102-00-73 rev01 1155x715x285 F	X-162900-01 rev07	2245102-00-73 rev01 4
	from to			
	from to			
	from to			
	from to			
	from to			
	from to			

REMARKS:

WATER TEMPERATURE BEFORE QUENCHING IS 25°C. AND AFTER 35°C. PIECES CONFORMING TO DIMENSIONAL AND VISUAL CONTROL. HEAT TREATMENT FURNACE IS CALIBRATED ACCORDING TO API 6A 20° ED. ANNEX M. HBN OBTAINED ON Q.T.C.: 223. MATERIAL ACCORDING TO SPEC. MS-011272 REV. 04 DASH 04 REV. 02 AND QP-000803-04 REV. 02. SAMPLING MECHANICAL TEST AT 1/4 T FROM Q.T.C. SIZE: 4"x4"x8". REDUCTION RATIO: 4,65:1. CYCLE TIME ACCORDING TO METHOD C OF SPEC. MS-003803-01 REV. 04. P.W.H.T. CONDITION HAS BEEN CARRIED OUT ON HALF Q.T.C. TEST N° 7183P. HEATING RATE 100° C./Hr. HOLDING TIME AT 637° C. FOR 6 HOURS. COOLING RATE DOWN TILL 150° C 50° C/Hr. FROM 150° C. COOLING IN STILL AIR. LATERAL EXPANSION FOR TEST 7183: 1,7 - 2,1 - 1,8 mm; FOR TEST 7183P: 1,7 - 1,7 - 1,8 mm. IMPACT TEST SIZE IS 10x10 mm. MATERIAL SUPPLIED IS FREE FROM RADIOACTIVE CONTAMINATION. PIECES HAVE BEEN ROUGH MACHINED BEFORE HEAT TREATMENT AND THEN MACHINED AFTER HEAT TREATMENT TO RESPECT TOLERANCIES.

Material conforming ☒
Material non conforming ☐

Quality Control Dept.

Surveyor:

MET/SID/SGQ 138/99 Page 1 di 1



100% APPROVED
20/03/2013

WELD DATA SHEET

Désignation : BOP, 18-3/4" 10M, 'DL'

Sn° 112756859-1

Serial	Process	WPS	Welder	Lot number	size	name	PWHT (°C/time)
<u>Weld type :</u>	<u>Overlay inconel 625 on Body ring groove.</u>						
112539069-1	SAW	141706-99	R4	10186151	2.0	PHYWELD 625	8414-755 (638/7h00)
				7502292	Flux	SOUDOKAY RECORD NiCrW-412	
	SAW	141706-99	2S/3A	100446	2.0	THYSSEN THERMANIT 625	
				7502326	Flux	SOUDOKAY RECORD NiCrW-412	
	GTAW	171914-01	2D	10176099	1.2	PHYWELD 625	
	GTAW	171914-01	3O/2D	10175851	1.2	PHYWELD 625	
<u>Weld type :</u>	<u>Overlay inconel 625 on outlets ring groove.</u>						
112567412-1	SAW	141706-99	A3	10183069	2.0	PHYWELD 625	8414-740 (638/6h00)
				27111387	Flux	OERLIKON OP XNI 9	

We Cameron France certify that WPS & welders have been qualified in accordance with ASME section IX.



Date: 00-janv-00

QC Stamp :

60Min

A

B

5

10
8
7
6
5
4
3
2
1
0

TEST

OPEN

13.500 (ST)

C

55

B

50

A

45

Back
29334111

PRAVET
CAMERON
VALVE SIZE / PRESSURE : 13" 101m
SERIAL No : 112356859-01
INSPECTOR COTF :
DATE : 20/06/13
PRESSURE SCALE :

ORDER No : 8323805
CUSTOMER :

ORDER No :

PRESSURE GAGE SERIAL
LP : HP 33

INSPECTOR :

A 100 PSI
B 1000
C

ITEM : 10

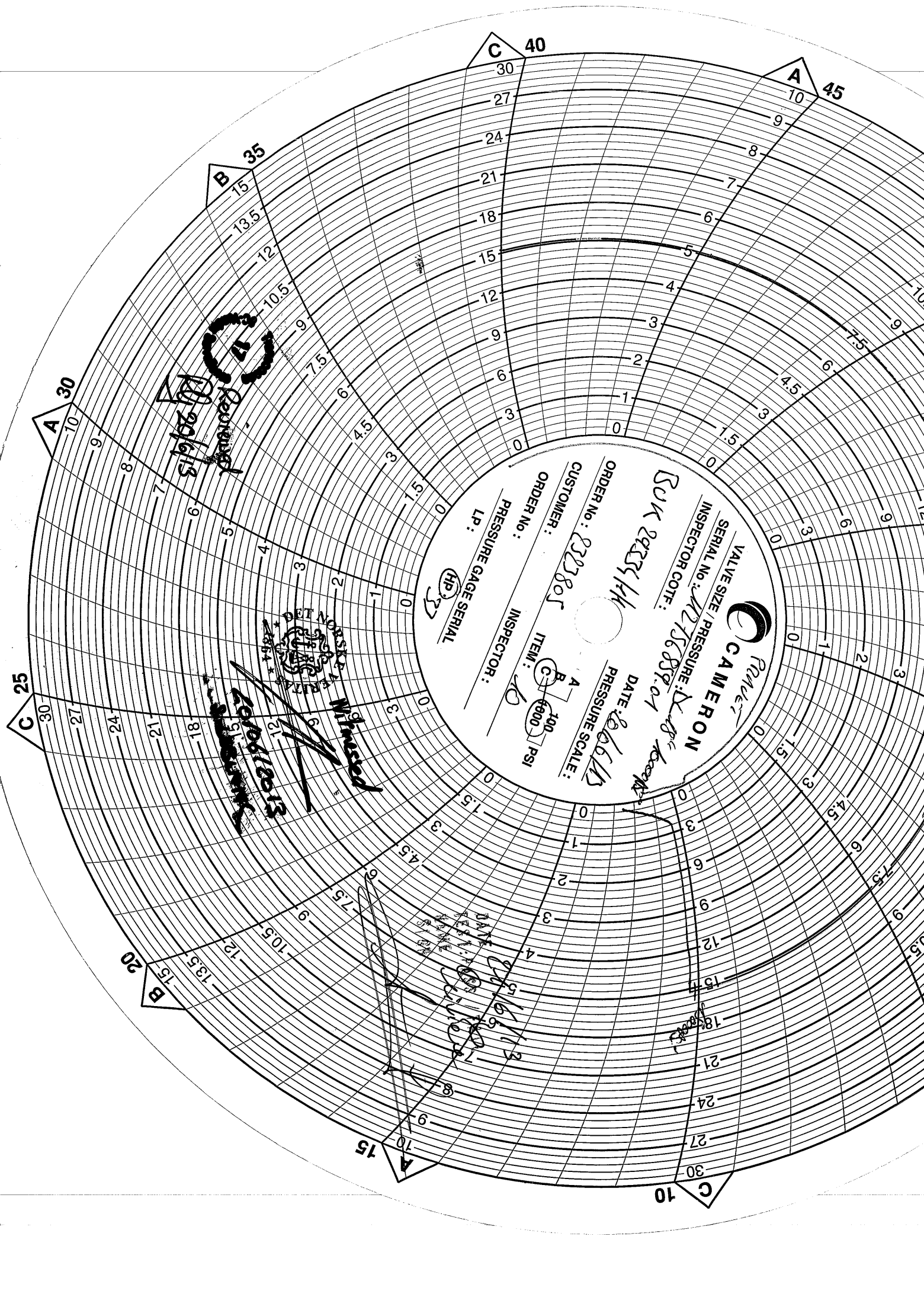
Handwritten notes and signatures in the bottom left quadrant.

Handwritten signature and date: 20/06/13.

Stamp: OET MORSKE VERBODEN

Handwritten signature and date: 20/06/2013, S. LEBLANC.

Handwritten note: Check no 1



CAMERON
VALVE SIZE / PRESSURE: *1/2" / 1500 PSI*
SERIAL No.: *412156889.01*
INSPECTOR COTF: *...*

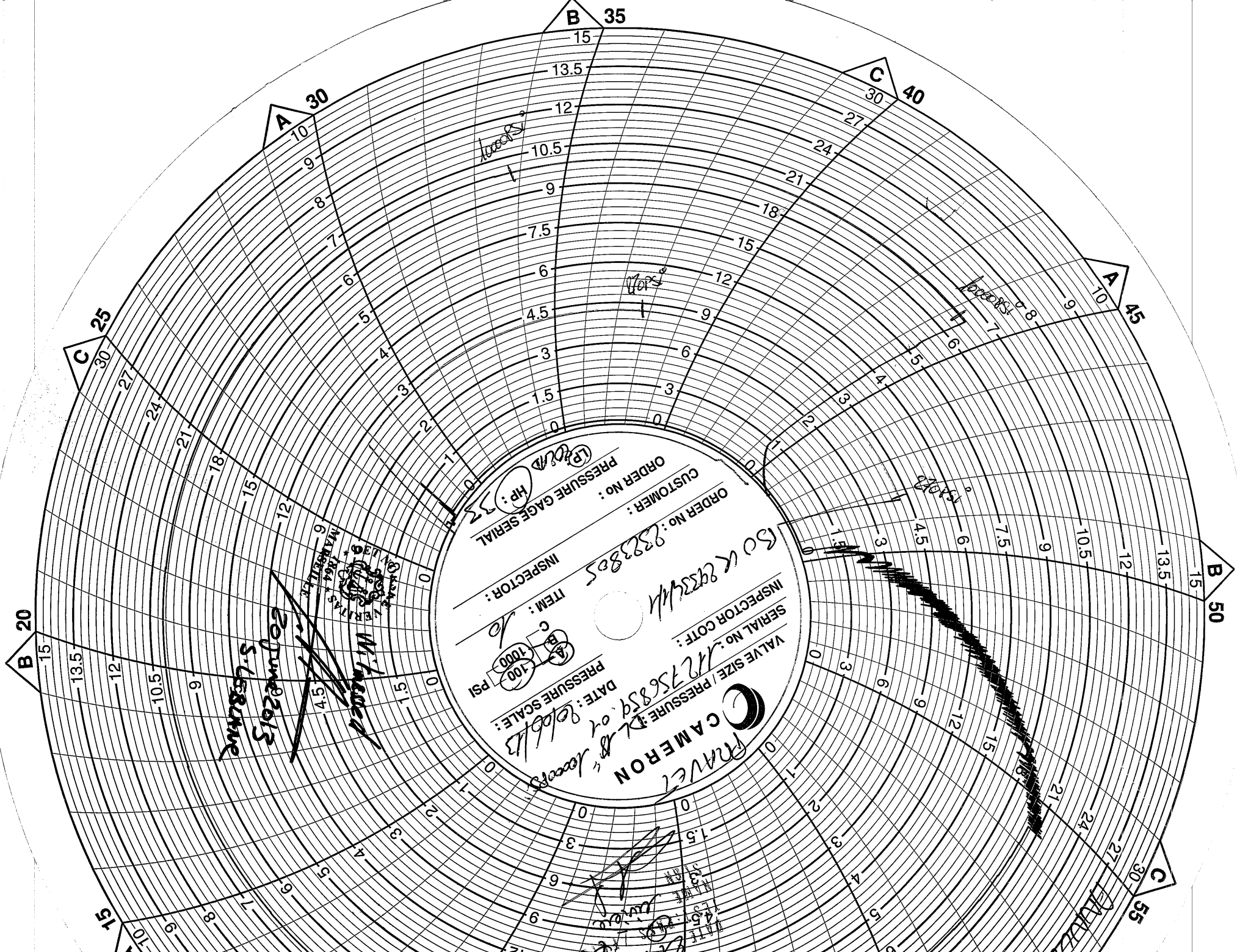
ORDER No.: *833805*
CUSTOMER: *...*
DATE: *2/26/13*
PRESSURE SCALE: *...*
ORDER No.: *...*
ITEM: *...*
INSPECTOR: *...*
LP: *...*



Record
2/26/13

Witnessed
2/26/13

DATE: 2/26/13
...



INSTRUMENTS ET CONTROLS
 4, rue Panhard 91830 LECOURDAY-MONTEAUX Tél.: (1) 64 92 92 30

60 Min.

TEST HYDRAULIC OPERATING SYSTEM OPEN SIDE 3000 PSI



CAMERON

VALVE SIZE / PRESSURE: 18" 3/4 - 10K
 SERIAL No: 112756859-01

DATE: 19/06/2013

INSPECTOR COTF:

PRESSURE SCALE:
☒ A ☐ B ☐ C x 100 ☐ PSI

Box DL
 Buk: 8014
 Fusco.w

ORDER No: 2323805

ITEM: 10

CUSTOMER:

INSPECTOR:

ORDER No:

PRESSURE GAGE SERIAL
 LP: HP: 111966012



Reviewed
 19/6/13

DATE
 TEST: 19/6/13
 NAME
 SIGN

PRAVET
CAMERON

VALVE SIZE / PRESSURE: 18" 10000 PSI
SERIAL No: M756859-01
INSPECTOR COTF: BOK 8014

DATE 20/6/13

PRESSURE SCALE:

A 100 PSI
B 1000
C

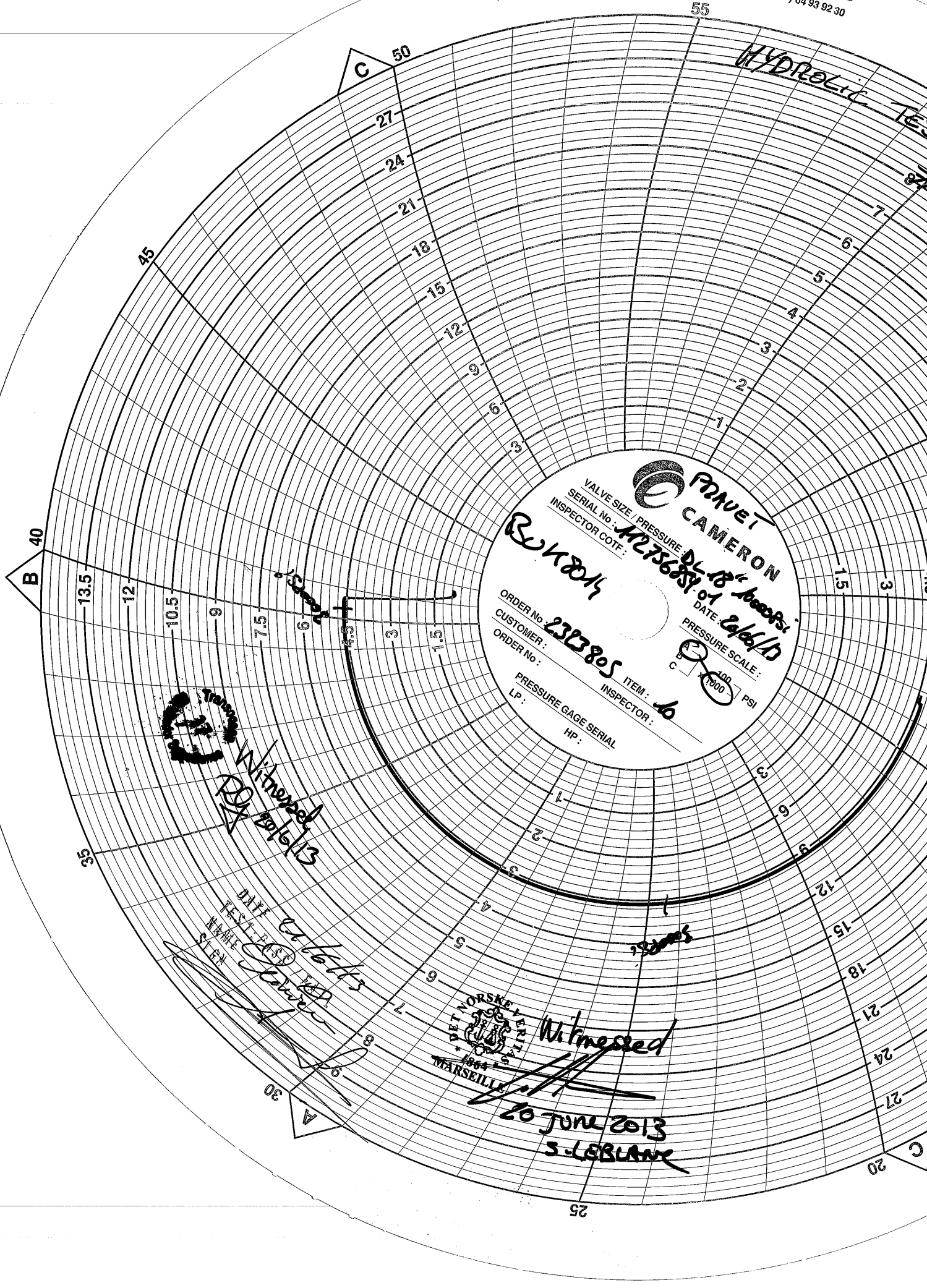
ORDER No: 8323805
CUSTOMER:

ITEM: 12
INSPECTOR:
PRESSURE GAGE SERIAL
LP:

WITNESSED
20 June 2013
MARSEILLE

DATE 20/6/13
TESTED / CAL
NAME
SIGN

WITNESSED
20/6/13



MAVET CAMERON
VALVE SIZE / PRESSURE: **1/2" x 1500 PSI**
SERIAL No.: **M275687-01**
INSPECTOR COTF: **2323805**
DATE: **26/06/13**
PRESSURE SCALE: **100 PSI**
ITEM: **16**
INSPECTOR: **S. LEBLANC**
ORDER No.: **2323805**
CUSTOMER: **WITNESSED**
PRESSURE GAGE SERIAL: **16**
LP: **16**
HP: **16**



WITNESSED
26/06/13



WITNESSED

20 JUNE 2013

S. LEBLANC