4500368628-05
64649.CS.CS 2.4

Valves and Measurement

257 Holloway Blvd.
Ville Platte, La 70586
Tel +1 337 363 7500
Fax +1 337 363 9701

Serial-
121092078-3

CAMERON
A Schlumberger Company

1/16/2018

CERTIFICATE OF TESTS AND COMPLIANCE

CUSTOMER: DOMINION TRANSMISSION

CUST P/O NO.: 4500368628

CAMERON SALES ORDER NO.: 3510157

CAMERON S/O ITEM NO.: 51

VALVE PART NO.: CAM-BV

VALVE TRIM: 1

☑ ***CAMERON*** ☐ ***TOM WHEATLEY*** ☐ ***GROVE*** ☐ ***WKM*** ☐ ***G4N*** ☐ ***TK*** ☐ ***TXT***

VALVE SIZE/PRESSURE CAMERON 30 X 30 " 600 # RF X RF

VALVE SERIAL NUMBER(S):

121092078-1 AND -3

TEST PRESSURES (PSI):

SHELL TEST: 2225 ***SEAT TEST:*** 1650 ***AIR TEST:*** 80

SPECIAL TEST (IF APPLICABLE): N/A

DOUBLE BLOCK AND BLEED TEST: 1650

Cameron, a Schlumberger company, certifies that the above listed valve(s) are in full conformance with API 6D 24th Edition and all addenda (as of this date hereby certified) and has/have successfully passed all applicable test in accordance with requirements thereof, including additional customer requirements agreed upon in the above indicated sales order. These results, as retained within our quality management system, have been verified and to the best of our knowledge are true and correct.

Carlene Ardoin
Quality Representative
Cameron, a Schlumberger company

Form E-VP-1044-L

Ball Valve 14"- 42" Assembly Set-Out Report

Form ID 25596

Production Order Number: 121092078 Qty 3 Assy Part no: CAM-BV Rev 01

Ped	lockdev	c02	pups	ext	wormshaft ext	coat	lifteyes	low_temp
☐	☐	☐	☐	☐	☐	☐	☐	☐

turn/grind	customer_witness	drain	hot	vent/seal	block
☐	☐	☐	☐	☐	☐

Size 30RF 30 30RF API WP Class 600 SP- 586-11

Sub-Assy Part no 508070-30-06-20 rev 02 Set-out Date 1/10/2018

Valve

ut	mag	dye
☐	☐	☐

Valve Serial number	Valve/Sub Assy SN	EndConn A Serial number	EndConn A Heat number	EndConn B Serial Number	EndConn B Heat number
1	121065272-8	121062316-7	246613	121059498-3	244600
2	121065272-2	121059498-10	90040	121062316-08	433535
3	121076043-1	121056705-06	92500	121056705-07	92500

Forging A Part no: 508960-30-06-01 EndConn A Part no: 508103-30-50-51 rev 04

Forging B Part no: 508960-30-06-01 EndConn B Part no: 508103-30-50-51 rev 04

Comments:

Pup-Pipes:

Setout performed by: TIM SOILEAU Stamp / Man number: 27677

Cleared by: pmanuel5 Date cleared: 1/11/2018

Material clearance:

ID 9590

Ball Valve 14"-42"Sub Set-Out Reports

Form E-VP-1061C

Assy Part No: 508070-30-06-20 **Rev:** 02 **Work order no:** 121065272 **Size :** 30

Trim: Nickel **Valve :** NonXray **Qty :** 8 **Sp(s) :**

Sub S.N.	Upper Shell Assembly P/N 508023-30-06-01 Rev A5		Lower Shell Assembly P/N 508033-30-06-01 Rev A4		Plug Assembly P/N 508333-30-09-17 Rev 02		
	Shell	Journal	Shell	Journal	Plug Assy	Plug	Upper Stem
1	s/n 121065272-6U hn A87341	s/n 121030601-5 hn 198313	s/n 121065272-5L hn A87341	s/n 121033138-17 hn 197353	s/n 121026028-4	s/n 121026028-4 hn 248186	s/n 121026028-4 hn 237660
2	s/n 121065272-2U hn A63153	s/n 121020553-9 hn 197862	s/n 121065272-2L hn C85085	s/n 121033138-18 hn 197353	s/n 121034468-2	s/n 121034468-2 hn 248188	s/n 121034468-2 hn L4090-A
3	s/n 121065272-1U hn A63153	s/n 121020553-8 hn 197862	s/n 121065272-4L hn C85085	s/n 121033138-21 hn 197353	s/n 121034468-5	s/n 121034468-5 hn 249139	s/n 121034468-5 hn L4090-A
4	s/n 121065272-4U hn A63153	s/n 121020553-7 hn 197862	s/n 121065272-1L hn C85085	s/n 121033138-19 hn 197353	s/n 121034468-4	s/n 121034468-4 hn 249138	s/n 121034468-4 hn 237660
5	s/n 121065272-7U hn A87341	s/n 121030601-8 hn 197761	s/n 121065272-3L hn C85085	s/n 121033138-22 hn 197353	s/n 120974217-1	s/n 120974217-1 hn 248188	s/n 120974217-1 hn 237660
6	s/n 121065272-3U hn A63153	s/n 121020553-6 hn 197862	s/n 121065272-8L hn A87341	s/n 121033138-25 hn 197761	s/n 121034468-3	s/n 121034468-3 hn 249138	s/n 121034468-3 hn L4090-A
7	s/n 121065272-5U hn A87341	s/n 121030601-7 hn 198313	s/n 121065272-6L hn A87341	s/n 121033138-20 hn 197353	s/n 121026029-3	s/n 121026029-3 hn 249135	s/n 121026029-3 hn L4090-A
8	s/n 121065272-8U hn A87341	s/n 121030601-6 hn 198313	s/n 121065272-7L hn A87341	s/n 121033138-23 hn 197353	s/n 121026028-8	s/n 121026028-8 hn 437720	s/n 121026028-8 hn L4090-A

	Forging p/n	Forging p/n	Forging p/n	Forging p/n		Forging p/n	Forging p/n
	508078-30-06-50	508082-07-05-02	508078-30-06-50	508084-07-05-02		508076-30-09-80	508915-08-40

Comments:

Employee Danny Crawford **Date completed:** 12/5/2017 **QA employee** pmanuel5 **Date approved** 12/18/2017

Tuesday, January 16, 2018

ID 9629

Ball Valve 14"-42"Sub Set-Out Reports

Form E-VP-1061C

Assy Part No: 508070-30-06-20 Rev: 02 Work order no: 121076043 Size : 30

Trim: Nickel Valve : NonXray Qty : 4 Sp(s) :

Sub S.N.	Upper Shell Assembly P/N 508023-30-06-01 Rev A5		Lower Shell Assembly P/N 508033-30-06-01 Rev A4		Plug Assembly P/N 508333-30-09-17 Rev 02		
	Shell	Journal	Shell	Journal	Plug Assy	Plug	Upper Stem
1	s/n 121076043-3U hn 17401373	s/n 121030601-2 hn 198313	s/n 121076043-1L hn A71727	s/n 121060222-21 hn 197353	s/n 121057857-4	s/n 121057857-4 hn 249139	s/n 121057857-4 hn C37125
2	s/n 121076043-4U hn 17401373	s/n 121030601-1 hn 198313	s/n 121076043-2L hn A71727	s/n 121060222-22 hn 197353	s/n 121057857-1	s/n 121057857-1 hn 249138	s/n 121057857-1 hn C37125
3	s/n 121076043-1U hn 17401373	s/n 121030601-4 hn 198313	s/n 121076043-3L hn 17401373	s/n 121060222-19 hn 197353	s/n 121057858-1	s/n 121057858-1 hn 243946	s/n 121057858-1 hn D1712285
4	s/n 121076043-2U hn 17401373	s/n 121055092-8 hn 197761	s/n 121076043-4L hn 17401373	s/n 121060222-20 hn 197353	s/n 121057858-4	s/n 121057858-4 hn 249138	s/n 121057858-4 hn D1712285

	Forging p/n	Forging p/n	Forging p/n	Forging p/n		Forging p/n	Forging p/n
	508078-30-06-50	508082-07-05-02	508078-30-06-50	508084-07-05-02		508076-30-09-80	508915-08-40

Comments:

Employee Danny Crawford Date completed: 12/19/2017 QA employee pmanuel5 Date approved 1/4/2018

Tuesday, January 16, 2018

Motilal

Material Certificate

EN 10204 : 2004

3.1 [X] 3.2 [ ]

Material	Qty.	Part No.	BOM Rev Lvl
ASTM 516 GR 70	13	508078-30-06-50	03

Client	Order No.	Item
CAMERON, VILLE PLATTE	4511239935	00020

Part Description :- BODY SHELL 30" 150/600

Heat No	Plate no / Cast no
A63153	08B0

Heat Treatment No.: MDW - FS - 569

Motilal Job Reference no (Internal): MV 1325 - MV 1337

MS [X] | REV: 10

MS-21007-01

CHEMICAL COMPOSITION

C%	Mn%	P%	S%	Si%	Cr%	Ni%	Mo%	Cu%	V%
0.15	1.40	0.015	0.002	0.32	0.012	0.004	0.0010	0.008	0.002
Al%	Co%	W%	Fe%	B%	N2%	Ti%	Nb%	Carbon Equiv.	
0.025						0.019	0.028	0.40	

MECHANICAL PROPERTIES (Post Forming)

QTC [X] SIZE 60mm X 70mm X 200mm (From Prolongation)

Tensil Test

Tensil Strength (MPA)	Yield Strength (MPA)	Elongation %	Reduction of Area %
533.04	352.33	36.82	77.61

Impact test (JOULES)

Type (1)	10x10x 55		
TEMP (°C)	-46		
SENS (1)	L		
	144		
	134		
	146		
Average	141.33		

Hardness HBN [X]

	MIN	MAX
On Part	167	170
On QTC	151	154

Acceptable As Per MS-21007-01 Rev.10 ASTM / ASME SA-516-70. [✓]

Verified [✓] Witnessed [ ] Thane India

HEAT TREATMENT

	Hot Forming	Tempering	Stress Relieve	Normalising	Solution Annealing
TEMP (°C)	920				
TEMPS (Min)	40				
COOLING	A				

Shells are Hot Formed at 920°C after Soaking Time of 40 mintues and then Air Cooled.

COOLING : A = Air ; W = Water

LP :- Not Performed.

Enclosures :- Mill TC, Post Forming Coupon Testing reports & Motilal TC.

APPROVED By 172932 at 1:16 pm, 2/16/17

MS-21007-01
Rev 10

MDEWPL CERTIFIES THAT THE MATERIAL PROVIDED COMPLIES WITH ALL OF CCV REQUIREMENTS AS STATED IN THE APPLICABLE PURCHASE ORDER. MDEWPL ALSO CERTIFY THAT THE MATERIAL SUPPLIED IS FREE FROM RADIOACTIVE CONTAMINATION.THIS INFORMATION HAS BEEN VERIFIED AND IS TRUE AND CORRECT TO THE BEST OF OUR KNOWLEDGE

NAME: Kamlesh V STAMP DATE: 7th Feb. 2017 CERTIFICATE NO - MD/MTC/569

Mottilal

Material Certificate

EN 10204 : 2004

3.1 [X] 3.2 [ ]

Material	Qty	Part No.	BOM Rev Lvl
ASTM 516 GR 70	12	508078-30-00-50	03

Client	Order No.	Item
CAMERON-VILLE PLATTE	4511350507	00030

Part Description :- BODY SHELL 30" 150/600

Heat No	Plate no / Cast no
A97341	WC3372111N
Heat Treatment No.	
MDW - ES - 682	
Mottilal Job Reference no (Internal)	
MV 1767 - MV 1778	

MS	X					REV
MS-21007-01						10

CHEMICAL COMPOSITION

	Max	Actual
C%	0.22	0.191
Mn%	0.85-1.80	1.176
S%	0.025	0.0030
P%	0.025	0.010
Si%	0.15-0.40	0.306
Cr%	0.30	0.013
Ni%	0.40	0.003
Cu%	0.40	0.007
Ti%	0.03	0.003
V%	0.03	0.005
Nb%	0.05	0.015
Mo%	0.12	0.001
Al%	0.08	0.028
CE	0.43	0.391

MECHANICAL PROPERTIES (Post Forming)

	Range	Actual
Tensil Strength (MPA)	483 - 621	519.64
Yield Strength (MPA)	262 (Min)	366.16
Elongation %	17% (Min)	36.66
Reduction of Area %		72.53

IMPACT TEST (JOULES)

TYPE		10x10x55	
TEMP (°C)		-46	
DIRECTION		T	
		ACTUAL	MIN
		146	21 J
		144	21 J
		120	21 J
	AVERAGE	136.67	27 J

HARDNESS (HBW)

Hardness Range (143 - 237 HBW)

	MIN	MAX
ON PART	156	166
ON QTC	150	150

Acceptable As Per MS-21007-01 Rev 10 & 11 / ASME Sec IX

Received / Inspected
Thane India

HEAT TREATMENT

	Hot Forming	Tempering	Stress Relieve	Normalising	Solution Annealing
TEMP (°C)	910				
TEMPS (Min)	40				
COOLING	A				

Shells are Hot Formed at 910°C after Soaking Time of 40 mintues and then Air Cooled.

COOLING : A = Air ; W = Water

VISUAL :- All the tubs have been visually examined and are free from cracks & burr's.

LP :- Not Performed.

UT :- All the plates have been UT Tested by the Mill and found satisfactory.

APPROVED
By PSelvan at 2:35 pm, 6/5/17
MS-021007-01 Rev 11

Enclosures :- Mill TC, Post Forming Coupon Testing reports & Mottilal TC.

MDEWPL CERTIFIES THAT THE MATERIAL PROVIDED COMPLIES WITH ALL OF CCV REQUIREMENTS AS STATED IN THE APPLICABLE PURCHASE ORDER. MDEWPL ALSO CERTIFY THAT THE MATERIAL SUPPLIED IS FREE FROM RADIOACTIVE CONTAMINATION. WE ALSO CERTIFY THAT NO WELD REPAIRS HAS BEEN PERFORMED. THIS INFORMATION HAS BEEN VERIFIED AND IS TRUE AND CORRECT TO THE BEST OF OUR KNOWLEDGE.

NAME: M.Pathak/P.Pandey (QA/QC) STAMP

DATE: 9th May 2017

CERTIFICATE NO : MD/MTC/682

Motilal

Material Certificate

EN 10204 : 2004

3.1 [X] 3.2 [ ]

Material	Qty	Part No.	BOM Rev Lvl
ASTM 516 GR 70	4	508078-30-06-50	03

Client	Order No.	Item
CAMERON, VILLE PLATTE	4511411941	00020

Part Description :- BODY SHELL 30" 150/600

Heat No	Plate no / Cast no
C85085	WA5610000N

Heat Treatment No. : MDW - FS - 723

Motilal Job Reference no (Internal) : MV 1851 - MV 1854

MS	X						REV
MS-21007-01							10

CHEMICAL COMPOSITION

	Max	Actual
C%	0.22	0.196
Mn%	0.85-1.50	1.152
S%	0.025	0.002
P%	0.025	0.012
Si%	0.15-0.40	0.314
Cr%	0.30	0.020
Ni%	0.40	0.008
Cu%	0.40	0.012
Ti%	0.03	0.002
V%	0.03	0.006
Nb%	0.05	0.018
Mo%	0.12	0.002
Al%	0.08	0.035
CE	0.43	0.395

MECHANICAL PROPERTIES (Post Forming)

	Range	Actual
Tensil Strength (MPA)	483 - 621	528.71
Yield Strength (MPA)	262 (Min)	349.06
Elongation %	17% (Min)	31.12
Reduction of Area %		68.27

IMPACT TEST (JOULES)

TYPE	10x10x55	
TEMP (°C)	-46	
DIRECTION	L	
	ACTUAL	MIN
	72	21 J
	82	21 J
	108	21 J
AVERAGE	87.33	27 J

HARDNESS (HBW)

Hardness Range (143 - 237 HBW)

	MIN	MAX
ON PART	161	163
ON QTC	148	149

Acceptable As Per MS-21007-01 Rev-10 ASTM / ASME A 516-70 [✓]

Reviewed [✓] Witnessed [ ]

HEAT TREATMENT

	Hot Forming	Tempering	Stress Relieve	Normalising	Solution Annealing
TEMP (°C)	910				
TEMPS (Min)	40				
COOLING	A				

Shells are Hot Formed at 910°C after Soaking Time of 40 mintues and then Air Cooled

COOLING : A = Air ; W = Water

VISUAL :- All the jobs have been visually examined and are free from cracks & burr's.

LP :- Not Performed.

UT :- All the plates have been UT Tested by the Mill and found satisfactory.

APPROVED
By NRajan2 at 2:38 pm, 7/11/17

MS-021007-01 Rev 11

Enclosures :- Mill TC, Post Forming Coupon Testing reports & Motilal TC.

MDEWPL CERTIFIES THAT THE MATERIAL PROVIDED COMPLIES WITH ALL OF CCV REQUIREMENTS AS STATED IN THE APPLICABLE PURCHASE ORDER. MDEWPL ALSO CERTIFY THAT THE MATERIAL SUPPLIED IS FREE FROM RADIOACTIVE CONTAMINATION. WE ALSO CERTIFY THAT NO WELD REPAIRS HAS BEEN PERFORMED. THIS INFORMATION HAS BEEN VERIFIED AND IS TRUE AND CORRECT TO THE BEST OF OUR KNOWLEDGE.

NAME: M.Pathak/P.Pandey (QA/QC) SIGN:

DATE: 20th June 2017

CERTIFICATE NO - MD/MTC/723

Motilal

Material Certificate

EN 10204 : 2004

3.1 X 3.2

Material	Qty	Part No.	BOM Rev Lvl
ASTM 516 GR 70	13	508078-30-06-50	03

Client	Order No.	Item
CAMERON, VILLE PLATTE	4511429903	00010

Part Description :- BODY SHELL 30" 150/600

Heat No.	Plate no./ Cast no.
17401373	WD685911-1N

Heat Treatment No.: MDW - FS - 727

Motilal Job Reference no (Internal): MV 1884 - MV 1896

MS	X						REV
MS-21007-01							10

CHEMICAL COMPOSITION

	Max	Actual
C%	0.22	0.200
Mn%	0.85-1.50	1.165
S%	0.025	0.0050
P%	0.025	0.015
Si%	0.15-0.40	0.328
Cr%	0.30	0.016
Ni%	0.40	0.004
Cu%	0.40	0.003
Ti%	0.03	0.002
V%	0.03	0.003
Nb%	0.05	0.015
Mo%	0.12	
Al%	0.08	0.035
CE	0.43	0.398

MECHANICAL PROPERTIES (Post Forming)

	Range	Actual
Tensil Strength (MPA)	483 - 621	538.09
Yield Strength (MPA)	262 (Min)	359.31
Elongation %	17% (Min)	33.20
Reduction of Area %		69.92

IMPACT TEST (JOULES)

TYPE		10x10x55	
TEMP (°C)		-46	
DIRECTION		L	
		ACTUAL	MIN
		90	21 J
		106	21 J
		84	21 J
	AVERAGE	93.33	27 J

HARDNESS (HBW)

Hardness Range (143 - 237 HBW)

	MIN	MAX
ON PART	156	156
ON QTC	156	156

Acceptable As Per MS-21007-01 Rev 10 ☑
ASTM / ASME A 516-70 ☑

Motilal
Reviewed ☑ Witnessed ☐
Thane, India

HEAT TREATMENT

	Hot Forming	Tempering	Stress Relieve	Normalising	Solution Annealing
TEMP.(°C)	910				
TEMPS (Min).	40				
COOLING	A				

Shells are Hot Formed at 910°C after Soaking Time of 40 mintues and then Air Cooled

COOLING : A = Air ; W = Water

APPROVED
By NRajan2 at 2:34 pm, 7/6/17

MS-021007-01 Rev 11

VISUAL :- All the jobs have been visually examined and are free from cracks & burr's.

LP :- Not Performed.

UT :- All the plates have been UT Tested by the Mill and found satisfactory.

Enclosures :- Mill TC, Post Forming Coupon Testing reports & Motilal TC.

MDEWPL CERTIFIES THAT THE MATERIAL PROVIDED COMPLIES WITH ALL OF CCV REQUIREMENTS AS STATED IN THE APPLICABLE PURCHASE ORDER. MDEWPL ALSO CERTIFY THAT THE MATERIAL SUPPLIED IS FREE FROM RADIOACTIVE CONTAMINATION. WE ALSO CERTIFY THAT NO WELD REPAIRS HAS BEEN PERFORMED. THIS INFORMATION HAS BEEN VERIFIED AND IS TRUE AND CORRECT TO THE BEST OF OUR KNOWLEDGE.

NAME: M.Pathak/P.Pandey (QA/QC) STAMP: MOTILAL OSWAL ENDS WORTH PVT. LTD. * THANE *

DATE: 20th June 2017

CERTIFICATE NO - MD/MTC/727

APPROVED
NRajan2 , 14:26:56, 06/10/2017

MS-021007-01 REV 11

Motilal

Material Certificate

EN 10204 : 2004

3.1 [X] 3.2 [ ]

Material	Qty	Part No.	BOM Rev Lvl
ASTM 516 GR 70	13	508078-30-06-50	'03

Client	Order No.	Item
CAMERON, VILLE PLATTE	4511514942	'00010

Part Description :- BODY SHELL 30" 150/600

Heat No	Plate no / Cast no
A71727	03A0

Heat Treatment No.: MDW - FS - 801

Motilal Job Reference no (Internal): MV 2014 - MV 2026

MS X — MS-21007-01 — REV 10

CHEMICAL COMPOSITION

	Max	Actual
C%	0.22	0.15
Mn%	0.85-1.50	1.42
S%	0.025	0.003
P%	0.025	0.016
Si%	0.15-0.40	0.25
Cr%	0.30	0.009
Ni%	0.40	0.005
Cu%	0.40	0.007
Ti%	0.03	0.016
V%	0.03	0.001
Nb%	0.05	0.015
Mo%	0.12	0.0004
Al%	0.08	0.029
CE	0.43	0.38

MECHANICAL PROPERTIES (Post Forming)

	Range	Actual
Tensil Strength (MPA)	483 - 621	524.97
Yield Strength (MPA)	262 (Min)	356.50
Elongation %	17% (Min)	40.84
Reduction of Area %		75.72

IMPACT TEST (JOULES)

TYPE	10x10x55	
TEMP (°C)	-46	
DIRECTION	L	
	ACTUAL	MIN
	100	21 J
	110	21 J
	88	21 J
AVERAGE	99.33	27 J

HARDNESS (HBW)

Hardness Range (143 - 237 HBW)

	MIN	MAX
ON PART	167	167
ON QTC	152	154

Acceptable As Per
MS-21007-01- Rev. 10 [✓]
ASTM / ~~ASME~~ A516-70 [✓]

Motilal
Reviewed [✓] Witnessed [ ]
Thane, India

HEAT TREATMENT

	Hot Forming	Tempering	Stress Relieve	Normalising	Solution Annealing
TEMP.(°C)	910				
TEMPS (Min)	40				
COOLING	A				

Shells are Hot Formed at 910°C after Soaking Time of 40 mintues and then Air Cooled

COOLING : A = Air ; W = Water

VISUAL :- All the jobs have been visually examined and are free from cracks & burr's.

LP :- Not Performed.

UT :- All the plates have been UT Tested by the Mill and found satisfactory.

Enclosures :- Mill TC, Post Forming Coupon Testing reports & Motilal TC.

MDEWPL CERTIFIES THAT THE MATERIAL PROVIDED COMPLIES WITH ALL OF CCV REQUIREMENTS AS STATED IN THE APPLICABLE PURCHASE ORDER. MDEWPL ALSO CERTIFY THAT THE MATERIAL SUPPLIED IS FREE FROM RADIOACTIVE CONTAMINATION. WE ALSO CERTIFY THAT NO WELD REPAIRS HAS BEEN PERFORMED. THIS INFORMATION HAS BEEN VERIFIED AND IS TRUE AND CORRECT TO THE BEST OF OUR KNOWLEDGE.

NAME: M.Pathak/P.Pandey (QA/QC) STAMP

DATE: 24th Sept. 2017

CERTIFICATE NO - MD/MTC/801

CERTIFICATE OF COMPLIANCE/MATERIAL TEST REPORT
СЕРТИФИКАТ СООТВЕТСТВИЯ / ОТЧЕТ ОБ ИСПЫТАНИЯХ МАТЕРИАЛА

MECHEL
Urals Stamping Plant

Material certificate
TRANSCRIPT, EN 10204
3.1 [V] 3.2 [ ]

Certificate No: / № сертификата: 147851

PO # / № заказа:	4511348732/20	Quantity / Количество:	39		
Part # / № детали:	508082-07-05-02	Description / Наименование:	Upper Journal 7-1/2" (E1070)	Rev. Level / Ревизия:	02
Drawing # / № чертежа:				Revision Level / Ревизия:	01
Mat. Spec./ Спецификация материала:	X-070380-07-02				
	ASTM A350 LF2 MS-021012-02-02, MS-021000-01,SP-054000-01				
Quality plan / План качества:				Revision Level / Ревизия:	05,06,07
Melting Practice/ Сп-б выплавки:	EFVD / Эл-печь+вак.дегаз	Heat # / № плавки:	198313	Revision Level / Ревизия:	
				Heat Treat Lot # / № партии термообр-ки:	88-1

Hot Work Ratio /Коэффициент ковки	
Product/ Поковка:	5
QTC / Образец-свидетель:	5

Grain Size / Размер зерна:

Element / Элемент	C	Mn	P	S	Si	Cr	Mo	Ni	V	Cu	Nb	Al
Reported by RM Supplier / Поставщик металла, %	0.18	0.94	0.011	0.002	0.25	0.08	0.006	0.07	0.005	0.06	-	0.026
Vendor's Actual / Поставщика деталей, %	0.192	0.94	0.0068	0.0022	0.26	0.063	0.018	0.074	0.0016	0.057	0.0067	0.023

Raw Material Supplier Certificate №/№ Сертификата поставщика металла: №8684-1977 от 07.06.2017г.
Comments / Примечания: Углеродный эквивалент(carbon equivalent) Поставщика металла,% (Reported by RM Supplier)= 0.36

Mechanical Properties /Мех. свойства: [ ] On part / На детали [V] On QTC (T/4)/На образце-свидетеле(T/4)

Tensile / Предел прочности, МПа	Yield / Предел текучести, МПа	Elongation / Удлинение, %	Reduction of Area / Сужение, %
500	284	40	77

Hardness / Твердость	HB	
	min	max
On Product / На детали	149	163
On QTC /На образце	143	179

Charpy V-Notch Impact Results (Longitudinal) / Результаты испытаний на удар по Шарпи с V-обр. надрезом (продольно)

Temperature / Температура, °C	Value / Значения, Joules	Value / Значения, Joules	Value / Значения, Joules	Average / Средние Joules
-46°	88	122	142	117

Heat Treatment / Термическая обработка

Product / Поковка	Cross Section or Size at HT / Сечение или размер при ТО:		
	Temp / Темп. °C	Time hrs:min / Время часы:мин	Cooling Method / Способ охлажд.
Aust/Quench Аусп/Закалка	860	2:00	Water
Temper/ Отпуск	610	3:20	Air

QTC / Образец-свидетель	QTC Size / Размер образца-свидетеля		100x100x200 mm
QTC was heat treated together with forgings / Образец-свидетель был обработан вместе с поковками	Temp / Темп. °C	Time hrs:min / Время часы:мин	Cooling Method / Способ охлажд.
Aust/Quench Аусп/Закалка	860	2:00	Water
Temper / Отпуск	610	3:20	Air

Quench Media Temperature / Тем-ра закалочной среды (°C)	At the beginning of Quench / В начале закалки	At the end of Quench / В конце закалки
Type of quench media/Тип закалочной среды	16	22
Monitoring Method / Способ контроля тем-ры закал.среды	Thermocouple in quenching bath / Термопара в закалочной ванне	

ПАО "Мечел" подтверждает, что поставленный материал соответствует всем требованиям Заказчика, которые указаны в Заказе на покупку и BOM. Данная информация была проверена, является правильной и правдивой / Urals Stamping Plant certify that material provided complies with all Cameron requirements as stated in the Purchase order and BOM. This information has been verified and is true and correct to the best of our knowledge.
Supplied material is free of radioactive pollution/ Поставляемый материал свободен от радиоактивного загрязнения.

Name / ФИО: Andreev A.N.
Title / Должность: Chief of QC Dept.
Signature / Подпись:
Date / Дата: 23.06.2017г.

CERTIFICATE OF COMPLIANCE/MATERIAL TEST REPORT
СЕРТИФИКАТ СООТВЕТСТВИЯ / ОТЧЕТ ОБ ИСПЫТАНИЯХ МАТЕРИАЛА

MECHEL

Material certificate
TRANSCRIPT. EN 10204
3.1 [V] 3.2 [ ]

Certificate No. / № сертификата: 145341-4

PO # / № заказа: 4511374813
Part # / № детали: 508062-07-05-02
Description / Наименование: Upper Journal 7-1/2" (E1070)
Quantity / Количество: 15
Drawing # / № чертежа: X-070380-07-02
Rev. Level / Ревизия: 02
Mat. Spec. / Спецификация материала: ASTM A350 LF2 MS-21012-02.02, MS-021000-01, SP-054000-01
Revision Level / Ревизия: 01
Quality plan / План качества:
Revision Level / Ревизия: 05.06.07
Melting Practice / Сп-б выплавки: EFVD / Эл-печь+вак.дегаз
Heat # / № плавки: 197862
Revision Level / Ревизия:
Heat Treat Lot # / № партии термообр-ки: 84-1

Hot Work Ratio /Коэффициент ковки	
Product/ Изделие:	5
QTC / Образец-свидетель:	5

Grain Size / Размер зерна:

Element / Элемент	C	Mn	P	S	Si	Cr	Mo	Ni	V	Cu	Nb	Al
Reported by RM Supplier / Поставщик металла, %	0.19	0.99	0.010	0.003	0.18	0.05	0.006	0.06	0.005	0.07	-	0.03
Vendor's Actual / Поставщик детали, %	0.181	0.97	0.0085	0.0025	0.193	0.043	0.012	0.055	0.0016	0.064	0.0004	0.03

Raw Material Supplier Certificate №/№ Сертификата поставщика металла: №8604-931 от 19.03.2017г.
Comments / Примечания: Углеродный эквивалент(carbon equivlent) Поставщик металла,% (Reported by RM Supplier)=0.30

Mechanical Properties /Мех. свойства: [ ] On part / На детали [V] On QTC (T/4)/На образце-свидетеле(T/4)

Tensile / Предел прочности, МПа	Yield / Предел текучести, МПа	Elongation / Удлинение, %	Reduction of Area / Сужение, %
510	314	39	80

Hardness / Твердость	HB	
	min	max
On Product / На детали	143	179
On QTC /На образце	163	179

Charpy V-Notch Impact Results (Longitudinal) / Результаты испытаний на удар по Шарпи с V-обр. надрезом (продольно)

Temperature / Температура, °C	Value / Значения, Joules	Value / Значения, Joules	Value / Значения, Joules	Average / Среднее Joules
-46°	205	293	193	230

Heat Treatment / Термическая обработка

Product / Изделие	Cross Section or Size mm(in) / Сечение или размер мм (дюйм)		
	Temp / Темп. °C	Time hrs:min / Время часы:мин	Cooling Method / Способ охлажд.
Aust/Quench Аус/Закалка	860	2:00	Water
Temper/ Отпуск	610	3:20	Air

QTC / Образец-свидетель	QTC Size / Размер образца-свидетеля		100x100x200 mm
QTC was heat treated together with forgings /Образец-свидетель был обработан вместе с поковками	Temp / Темп. °C	Time hrs:min / Время часы:мин	Cooling Method / Способ охлажд.
Aust/Quench Аус/Закалка	860	2:00	Water
Temper/ Отпуск	610	3:20	Air

Quench Media Temperature / Тем-ра закалочной среды (°C)	At the beginning of Quench / В начале закалки	At the end of Quench / В конце закалки
Type of quench media/Тип закалочной среды:	20	26
Monitoring Method / Способ контроля тем-ры закал.среды	Thermocouple in quenching bath / Термопара в закалочной ванне	

ПАО «Мечел» подтверждает, что поставляемый материал соответствует всем требованиям Заказчика, которые указаны в Заказе на покупку и BOM. Данная информация была проверена, является правильной и точной / Ural Stampings Plant certify that material provided complies with all Cameron requirements as stated in the Purchase order and BOM. This information has been verified and is true and correct to the best of our knowledge.
Supplied materials free of radioactive pollution/ Поставляемый материал свободен от радиоактивного загрязнения.

Name / ФИО: Andreev A.N.
Title / Должность: Chief of QC Dept.
Signature / Подпись:
Date / Дата: 23.05.2017г.

CERTIFICATE OF COMPLIANCE/MATERIAL TEST REPORT
СЕРТИФИКАТ СООТВЕТСТВИЯ / ОТЧЕТ ОБ ИСПЫТАНИЯХ МАТЕРИАЛА

MECHEL Steels Stampings Plant

Material certificate	Page 1 of 1 / Стр 1 из 1
TRANSCRIPT. EN 10204 3.1 [V] 3.2 [ ]	Certificate No. / № сертификата: 143390-3

PO # / № заказа: 4511288535 Quantity / Количество: 14

Part # / № детали: 508084-07-05-02 Description / Наименование: Lower Journal 7-1/2" (E1071) X-070379-07-02

Drawing # / № чертежа: Rev. Level / Ревизия: 02

Mat. Spec./ Спец.на материал: Revision Level / Ревизия: 01

Quality plan / План качества: ASTM A350 LF2 MS-021012-02-02, MS-021000-01, SP-054000-01 Revision Level / Ревизия: 07.06.08

Melting Practice/ Сп-б выплавки: EFVD / Эл-печь+вак.догаз Heat # / № плавки: 197353 Revision Level / Ревизия: Heat Treat Lot # / № партии термообр-ки: 20-1

Hot Work Ratio /Коэффициент ковки	
Product/ Поковка:	5
QTC / Образец-свидетель:	5

Grain Size / Размер зерна:

Element / Элемент	C	Mn	P	S	Si	Cr	Mo	Ni	V	Cu	Nb	Al
Reported by RM Supplier / Поставщика металла, %	0,19	0,97	0,014	0,002	0,20	0,04	0,005	0,05	0,005	0,03	-	0,029
Vendor's Actual / Поставщика деталей, %	0,20	0,96	0,011	0,0021	0,22	0,040	0,009	0,044	0,0049	0,029	0,0059	0,031

Raw Material Supplier Certificate №/№ Сертификата поставщика металла №8604-170 от 23.01.2017г.

Comments / Примечания: Углеродный эквивалент(carbon equivalent) Поставщика металла,% (Reported by RM Supplier)=0,38

Mechanical Properties /Мех. свойства: [ ] On part / На детали [V] On QTC (T/4)/На образце-свидетеле(T/4)

Tensile / Предел прочности, ksi	Yield / Предел текучести, ksi	Elongation / Удлинение, %	Reduction of Area / Сужение, %
76	49	39	78

Hardness / Твердость	HB	
	min	max
On Product / На детали	156	197
On QTC /На образце	170	179

Charpy V-Notch Impact Results (Longitudinal) / Результаты испытаний на удар по Шарпи с V-обр. надрезом (продольно)

Temperature / Температура, °C	Value / Значения, Joules	Value / Значения, Joules	Value / Значения, Joules	Average / Среднее Joules
-46°	149	176	148	158

Heat Treatment / Термическая обработка

Product / Поковка	Cross Section or Size at HT / Сечение или размер при ТО:		
	Temp / Темп. °C	Time hr:min / Время час:мин	Cooling Method / Способ охлажд.
Aust/Quench Ауст/Закалка	860	2:00	Water
Temper/ Отпуск	600	3:20	Air

QTC / Образец-свидетель	QTC Size / Размер образца-свидетеля:		100x100x200
QTC was heat treated together with forgings / Образец-свидетель был обработан вместе с поковками	Temp / Темп. °C	Time hr:min / Время час:мин	Cooling Method / Способ охлажд.
Aust/Quench Ауст/Закалка	860	2:00	Water
Temper / Отпуск	600	3:20	Air

Quench Media Temperature / Тем-ра закалочной среды (°C)	At the beginning of Quench / В начале закалки	At the end of Quench / В конце закалки
	30	34
Type of quench media/Тип закалочной среды		
Monitoring Method / Способ контроля темпры закал.среды	Thermocouple in quenching bath / Термопара в закалочной ванне	

ОАО «Уралкуз» подтверждает, что поставляемый материал соответствует всем требованиям Заказа, которые указаны в Заказе на покупку и BOM. Данная информация была проверена, является правдивой и точной / Urals Stampings Plant certify that material provided complies with all Cameron requirements as stated in the Purchase order and BOM. This information has been verified and is true and correct to the best of our knowledge.

Поставляемый материал свободен от радиоактивного загрязнения / Supplied materials free of radioactive pollution

Name / ФИО: Andreev A.N.

Title / Должность: Chief of QC Dept.

Signature / Подпись:

Date / Дата: 21.02.2017г.

Forgital Italy
FORGITALGROUP
via G.Spezzapria, 1
36010 Velo d'Astico
località Seghe (VI) ITALY
Tel. +39 0445 731313
Fax. +39 0445 731490

Q. C. DEPT

INSPECTION TEST CERTIFICATE

EN 10204:2004 3.1

No. T 735 / 2017 /COM r. 0 pg. 1 / 1

DELIVERY NOTE

JOB	*176 / 17 p. 1 / 0*	**CUSTOMER**	
SPECIFICATION	MR-000011 **REV** 01		CAMERON ENGINEERED VALVES
MATERIAL	ASTM A694 F50		
ADD. REQUIREMENTS	MS-021000-01 REV. 10		
IDENTIFICATION		**PURCHASE ORDER**	4511294763
HEAT N.	248188 **QUANTITY** 3	**POSITION**	1
SUPPLIER	ACCIAIERIE VENETE	**SHIPP. COND.**	UNTREATED
MELT METHOD	EFVD	**DRAWING**	X-071408-30-01 r.01
LOG NUMBER		**P. N.**	508076-30-09-80 r.02
ARTICLE	PLUGS 30" 900 Ø44.606x28.031x34,843 inch		

CHEMICAL REQUIREM.	C %	Mn %	Si %	P %	S %						Nb %			Ceq. %
min	0,180	1,100	0,350								0,020			
max	0,230	1,350	0,500	0,030	0,030						0,040			0,450

ACTUAL CHEMISTRY	C %	Mn %	Si %	P %	S %	Cr %	Ni %	Mo %	Cu %	Al %	Nb %	V %	H ppm	Ceq. %
ladle analysis	0,187	1,148	0,480	0,016	0,010	0,091	0,098	0,018	0,165	0,025	0,034	0,004	1,600	0,418
on product														

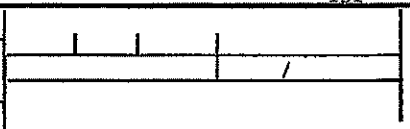
HARDNESS ON PIÈCES **ASTM E10/EN 6506**

HBW	REQUIRED	MIN	MAX	HBW	OBTAINED	MIN	MAX
		150	200			151	158

MECHANICAL REQUIREMENTS

FROM TEST BAR

		Dir.	UTS KSI	Ys/UTS	Ys 0.2% KSI	Ys 0.02% KSI	A %	Z %
TEMPERATURE	Min	LONG	72.5		50.0		10.0	20.0
20 °C	Max							



NORM ASTM A370

TEST NO.	Diam inch	Leng inch	Dir.							IMPACT TEST OBTAINED				HARDNESS HBW	
2017-403AX	0.5	2	LONG	79.0		50.8		31.0	62.0					152	154

REMARKS Grain size according to ASTM E112 : 6
Forgital Italy S.p.A. certifies that the material provided complies with all of CCV requirements as stated in the applicable purchase order. This information has been verified and is true and correct to the best of our knowledge.

The raw material and the finished products are tested to assure no radioactive contamination

APPROVED
By SVidrine at 9:10 am, 6/13/17

MR-000011 Rev 01

No repair welding performed

DATE	PERFORMED BY	APPROVED BY	INSPECTOR
Mar 08 2017	**FORGITAL ITALY SPA** Quality Dept. Laura Gonzo	FORGITAL SERVIZIO QUALITA' Ivo Spagnolo	

Forgital Italy
FORGITALGROUP
via G.Spezzapria, 1
36010 Velo d'Astico
località Seghe (VI) ITALY
Tel. +39 0445 731313
Fax. +39 0445 731490

Q. C. DEPT

INSPECTION TEST CERTIFICATE

EN 10204:2004 3.1

No. T 8080 / 2017 /COM r. 0 pg. 1/ 1

DELIVERY NOTE

JOB	*179 / 17 p. 1 / 0*	**CUSTOMER**	
SPECIFICATION	MR-000011 **REV** 01		CAMERON ENGINEERED VALVES KS 10/05/17
MATERIAL	ASTM A694 F50		
ADD. REQUIREMENTS	MS-021000-01 REV. 10		
IDENTIFICATION		**PURCHASE ORDER**	735534511349411 L.10 KS 10/05/17
HEAT N.	249139 **QUANTITY** 5	**POSITION**	1
SUPPLIER	ACCIAIERIE VENETE KS 10/05/17	**SHIPP. COND.**	UNTREATED
MELT METHOD	EFVD	**DRAWING**	X-071408-30-01 r.01
LOG NUMBER		**P. N.**	508076-30-09-80 r.02
ARTICLE	PLUGS 30" 900 Ø 44.606x28.031x34.843 inch		

CHEMICAL REQUIREM...	C %	Mn %	Si %	P %	S %						Nb %			Ceq. %
min	0,180	1,100	0,350								0,020			
max	0,230	1,350	0,500	0,030	0,030						0,040			0,450

ACTUAL CHEMISTRY	C %	Mn %	Si %	P %	S %	Cr %	Ni %	Mo %	Cu %	Al %	Nb %	V %	H ppm	Ceq. %
ladle analysis	0,194	1,130	0,451	0,017	0,007	0,171	0,147	0,047	0,194	0,027	0,028	0,001	1,300	0,448
on product														

HARDNESS ON PIÈCES **ASTM E10/EN 6506**

HBW	REQUIRED	MIN	MAX	HBW	OBTAINED	MIN	MAX
		150	200			152	160

MECHANICAL REQUIREMENTS

FROM TEST BAR

	Dir.	UTS KSI	Ys/UTS	Ys 0.2% KSI	Ys 0.02% KSI	A %	Z %
TEMPERATURE Min	LONG	72.5		50.0		10.0	20.0
20 °C Max							

NORM ASTM A370

TEST NO.	Diam Inch	Leng Inch	Dir.							IMPACT TEST OBTAINED				HARDNESS HBW	
2017 -3566AX	0.5	2	LONG	78.8		50.5		33.0	65.0					152	154

REMARKS Grain size according to ASTM E112 : 6

Forgital Italy S.p.A. certifies that the material provided complies with all of CCV requirements as stated in the applicable purchase order. This information has been verified and is true and correct to the best of our knowledge.

The raw material and the finished products are tested to assure no radioactive contamination

APPROVED

MR-000011 REV 01

No repair welding performed

DATE	PERFORMED BY	APPROVED BY	INSPECTOR
Aug 02 2017	FORGITAL ITALY SPA Quality Dept. Laura Gonzo	FORGITAL SERVIZIO QUALITA' Ivo Spagnola	

ForgitalUSA

CERTIFIED MATERIAL TEST REPORT

MTR # 36504

APPROVED

MS-021012-02-02 REV 00

Sales Order Number	79807-00	**Item**	1
Purchase Order	4511374659 L.10	**Customer**	CAMERON ENGINEERED VALVES
Specification	MS-021012-02	**Country of Origin:**	ITALY
Requirements		**State Of Delivery:**	Quench and Tempered
Material	ASTM A350 LF2 Cl 1 (UNS K03011)	**Drawing:**	X-057358-01 REV.02
Article	30" 600 FE	**Part Number:**	506960-30-06-01 R.03
Heat - Supplier	92500 DFN	**Quantity:**	13
Serial Number	IF 1088 676/17-01/00	**Test Number**	QT92500

Chemical Composition %

Melting Practice: E.F.V.D.

	C	Mn	Si	P	S	Cr	Ni	Mo	Cu	SN	AL
Required	≤ .21	0.6-1.35	.15 - .30	≤ 0.030	≤0.030	≤0.30	≤0.40	≤0.12	≤ 0.40		
Ladle	0.164	1.202	0.27	0.012	0.002	0.116	0.092	0.015	0.136	0.008	0.029
Product	---	---	---	---	---	---	---	---	---		

	Nb	V	Ti	Co	B	As	Sb	H	N	Ceq IIW	Cr+Mo	1*
Required	≤ 0.020	≤ 0.050								≤	≤ 0.32	≤ 1.00
Ladle	0.002	0.001	0.004					2	69	0.41	0.131	0.36
Product	---	---	---	---	--				---	---	---	---

*1 Cu + Ni + Cr + V + Mo 1.00 max.

Heat Treatment

Austenitized: 1650F HELD 4HRS, WATER QUENCHED

Tempered at: 1100F, Held 6 HRS, Air Cooled.

Water Temp: start 78° F, End 105° F

Hardness on Pieces

HB Required (min/max) 143-197 10/3000 HBW

HB Obtained (min/max) 151-154 HBW

Mechanical Properties

MS-021000-01

Specimen demension for Tensile test		Specimen dimension for Impact test	
.500 (inch)	2" Length (inch)	(10mm x 10mm)	Length (55mm)

Tensile Test		UTS - Rm	YS - Rp0,2%	Elong. - A	Red. of area - Z	Hardness HBW
Test number	Direction	483 - 559 MPa	≥ 277 MPa	≥ 22%	≥ 30%	143-197
Q92500	LONG	532	355	36.5	66.8	152

Impact tests

Test n	Temperature	Direction	KV Energy J		27/21 J	Lateral expansion			Shear fracture
QT92500	-50° F.	LONG	107	147	112	0.048	0.055	0.043	

QTC size 4 X 4 X 8 min. Heat Treated per requirement. Grain size 6-8. Better than 4:1 hot work ratio. 10/3000 HBW

Notes: Din 50049 3.1.b, EN 10204 3.1.b; EN 10204: 2004 3.1; ISO 10474 3.1.b; Forged in Italy, Heat Teated in Houston, Tx.; API 6A, Annex M, 20th Ed.; API 6D Annex F 24th Ed.; Furnace T/C; ASTM E10; ASTM A961; NACE MR 01 75

Forgital USA Inc. certifies that the material provided complies with all of CCV requirements as stated in the applicable P.O. This information has been verified and is true and correct to the best of our knowledge.

Location	Date	Initiated by	Approved by
8989 Monroe Houston, Texas 77063	8/14/2017	Anabel Ramirez QA	David Suffel QA Manager

ForgitalUSA
FORGITALGROUP

CERTIFIED MATERIAL TEST REPORT

MTR # 34255

APPROVED
By 172932 at 12:16 pm, 1/25/17

MS-021012-02-02 Rev 08

Sales Order Number	77243-00	**Item**	1
Purchase Order	4511157876	**Customer**	CAMERON ENGINEERED VALVES
Specification	MS-021012-02	**Country of Origin:**	ITALY
Requirements		**State Of Delivery:**	Quench and Tempered
Material	ASTM A350 LF2 Cl 1 (UNS K03011)	**Drawing:**	X-057356-01 REV.02
Article	30" 600 FE (FE630)	**Part Number:**	508960-30-06-01
Heat - Supplier	244600 VEN	**Quantity:**	2
Serial Number	IF 1127 1750/16-01/00	**Test Number**	QT244600

Chemical Composition %

Melting Practice: E.F.V.D.

	C	Mn	Si	P	S	Cr	Ni	Mo	Cu	SN	AL
Required	≤ .21	0.6-1.35	.15 - .30	≤ 0.030	≤0.030	≤0.30	≤0.40	≤0.12	≤ 0.40		
Ladle	0.168	1.152	0.215	0.007	0.008	0.131	0.199	0.062	0.152	0.008	0.031
Product	—	—	—	—	—	—	—	—	—		

	Nb	V	Ti	Co	B	As	Sb	H	N	Ceq IIW	Cr+Mo	1*
Required	≤ 0.020	≤ 0.050								≤	≤ 0.32	≤ 1.00
Ladle	0.002	0.003	0.002			0.005		1.5	87	0.42	0.193	0.547
Product	—	—	—	—	—				—	—	—	—

*1 Cu + Ni + Cr + V + Mo 1.00 max.

Heat Treatment

Austenitized: 1650F HELD 4HRS, WATER QUENCHED

Tempered at: 1100F HELD 6HRS, AIR COOLED

Water Temp: Start 68 ° F, End 95 ° F

Hardness on Pieces

HB Required (min/max) 143-197 10/3000 HBW

HB Obtained (min/max) 162 HBW

Mechanical Properties

MS-021000-01

Specimen dimension for Tensile test		Specimen dimension for Impact test		
.500 (inch)	2" Length (inch)		(10mm x 10mm)	Length (55mm)

Tensile Test		UTS - Rm	YS - Rp0,2%	Elong. - A	Red. of area - Z	Hardness HBW
Test number	Direction	483 - 559 MPa	≥ 277 MPa	≥ 22%	≥ 30%	143-197
Q244600	LONG	538	346	34.8	66	153

Impact tests

Test n	Temperature	Direction	KV Energy J	27/21 J		Lateral expansion			Shear fracture
QT244600	-50° F.	LONG	98	100	95	0.041	0.042	0.039	

QTC size 4 X 4 X 8 min. Heat Treated per requirement. Grain size 6-8. Better than 4:1 hot work ratio. 10/3000 HBW

Notes: Din 50049 3.1.b, EN 10204 3.1.b; EN 10204: 2004 3.1; ISO 10474 3.1.b; Forged in Italy, Heat Teated in Houston, Tx.; API 6A, Annex M, 20th Ed.; API 6D Annex F 24th Ed.; Furnace T/C; ASTM E10; ASTM A961; NACE MR 01 75

Forgital USA Inc. certifies that the material provided complies with all of CCV requirements as stated in the applicable P.O . This information has been verified and is true and correct to the best of our knowledge.

Location	Date	Initiated by	Approved by
8989 Monroe Houston, Texas 77063	11/11/2016	Anabel Ramirez QA	David Suffel QA Manager

ForgitalUSA

CERTIFIED MATERIAL TEST REPORT

MTR # 36504

APPROVED

MS-021012-02-02 REV 08

Sales Order Number	79807-00	**Item**	1
Purchase Order	4511374659 L.10	**Customer**	CAMERON ENGINEERED VALVES
Specification	MS-021012-02	**Country of Origin:**	ITALY
Requirements		**State Of Delivery:**	Quench and Tempered
Material	ASTM A350 LF2 Cl 1 (UNS K03011)	**Drawing:**	X-057356-01 REV.02
Article	30" 600 FE	**Part Number:**	508980-30-08-01 R.03
Heat - Supplier	92500 DFN	**Quantity:**	13
Serial Number	IF 1088 676/17-01/00	**Test Number**	QT92500

Chemical Composition %

Melting Practice: E.F.V.D.

	C	Mn	Si	P	S	Cr	Ni	Mo	Cu	SN	AL
Required	≤ .21	0.6-1.35	.15 - .30	≤ 0.030	≤0.030	≤0.30	≤0.40	≤0.12	≤ 0.40		
Ladle	0.164	1.202	0.27	0.012	0.002	0.116	0.092	0.015	0.136	0.008	0.029
Product	---	----	----	----	----	---	----	----	-----		

	Nb	V	Ti	Co	B	As	Sb	H	N	Ceq IIW	Cr+Mo	1*
Required	≤ 0.020	≤ 0.050								≤	≤ 0.32	≤ 1.00
Ladle	0.002	0.001	0.004					2	69	0.41	0.131	0.36
Product	-----	-----	---	---	--				---	----	---	---

*1 Cu + Ni + Cr + V + Mo 1.00 max.

Heat Treatment

Austenitized: 1650F HELD 4HRS, WATER QUENCHED

Tempered at: 1100F, Held 6 HRS, Air Cooled.

Water Temp: start 78° F, End 105° F

Hardness on Pieces

HB Required (min/max) 143-197 10/3000 HBW

HB Obtained (min/max) 151-154 HBW

Mechanical Properties

MS-021000-01

Specimen demension for Tensile test		Specimen dimension for Impact test	
.500 (inch)	2" Length (inch)	(10mm x 10mm)	Length (55mm)

Tensile Test		UTS - Rm	YS - Rp0,2%	Elong. - A	Red. of area - Z	Hardness HBW
Test number	Direction	483 - 559 MPa	≥ 277 MPa	≥ 22%	≥ 30%	143-197
Q92500	LONG	532	355	36.5	66.8	152

Impact tests

Test n	Temperature	Direction	KV Energy J	27/21 J		Lateral expansion			Shear fracture
QT92500	-50° F.	LONG	107	147	112	0.048	0.055	0.043	

QTC size 4 X 4 X 8 min. Heat Treated per requirement. Grain size 6-8. Better than 4:1 hot work ratio. 10/3000 HBW

Notes: Din 50049 3.1.b, EN 10204 3.1.b; EN 10204: 2004 3.1; ISO 10474 3.1.b; Forged in Italy, Heat Teated in Houston, Tx.; API 6A, Annex M, 20th Ed.; API 6D Annex F 24th Ed.; Furnace T/C; ASTM E10; ASTM A961; NACE MR 01 75

Forgital USA Inc. certifies that the material provided complies with all of CCV requirements as stated in the applicable P.O . This information has been verified and is true and correct to the best of our knowledge.

Location	Date	Initiated by	Approved by
8989 Monroe Houston, Texas 77063	8/14/2017	Anabel Ramirez QA	David Suffel QA Manager

ForgitalUSA

CERTIFIED MATERIAL TEST REPORT

MTR # 35495

APPROVED
By DSivalingam at 4:48 pm, 5/4/17

MS-021012-02-02 REV 08

Sales Order Number	79563-00	**Item**	1
Purchase Order	4511352311	**Customer**	CAMERON ENGINEERED VALVES
Specification	MS-021012-02	**Country of Origin:**	ITALY
Requirements		**State Of Delivery:**	Quench and Tempered
Material	ASTM A350 LF2 Cl 1 (UNS K03011)	**Drawing:**	X-057356-01 REV.02
Article	30" 600 FE (FE630)	**Part Number:**	508960-30-06-01 R.03
Heat - Supplier	90040 DFN	**Quantity:**	4
Serial Number	IF 1030 180/17-01/00	**Test Number**	QT90040

Chemical Composition %

Melting Practice: E.F.V.D.

	C	Mn	Si	P	S	Cr	Ni	Mo	Cu	SN	AL
Required	≤ .21	0.6-1.35	.15 - .30	≤ 0.030	≤0.030	≤0.30	≤0.40	≤0.12	≤ 0.40		
Ladle	0.170	1.18	0.274	0.015	0.002	0.22	0.08	0.02	0.12	0.006	0.026
Product	---	---	---	---	---	---	---	---	---		

	Nb	V	Ti	Co	B	As	Sb	H	N	Ceq IIW	Cr+Mo	1*
Required	≤ 0.020	≤ 0.050								≤	≤ 0.32	≤ 1.00
Ladle	0.001	0.012	0.004					2	69	0.43	0.24	0.452
Product	---	---	---	---	---				---	---	---	---

*1 Cu + Ni + Cr + V + Mo 1.00 max.

Heat Treatment

Austenitized: 1650F HELD 4HRS, WATER QUENCHED
Tempered at: 1100F HELD 6HRS, AIR COOLED
Water Temp: Start 80 ° F, End 102 ° F

Hardness on Pieces

HB Required (min/max) 143-197 10/3000 HBW

HB Obtained (min/max) 148-151 HBW

Mechanical Properties

MS-021000-01

Specimen demension for Tensile test		Specimen dimension for Impact test		
.500 (inch)	2" Length (inch)		(10mm x 10mm)	Length (55mm)

Tensile Test		UTS - Rm	YS - Rp0,2%	Elong. - A	Red. of area - Z	Hardness HBW
Test number	Direction	483 - 559 MPa	≥ 277 MPa	≥ 22%	≥ 30%	143-197
Q90040	LONG	527	352	35.2	66	154

Impact tests

Test n	Temperature	Direction	KV Energy J	27/21 J		Lateral expansion			Shear fracture
QT90040	-50° F.	LONG	137	136	115	0.055	0.055	0.047	

QTC size 4 X 4 X 8 min. Heat Treated per requirement. Grain size 6-8. Better than 4:1 hot work ratio. 10/3000 HBW

Notes: Din 50049 3.1.b, EN 10204 3.1.b; EN 10204: 2004 3.1; ISO 10474 3.1.b; Forged in Italy, Heat Teated in Houston, Tx.; API 6A, Annex M, 20th Ed.; API 6D Annex F 24th Ed.; Furnace T/C; ASTM E10; ASTM A961; NACE MR 01 75

Forgital USA Inc. certifies that the material provided complies with all of CCV requirements as stated in the applicable P.O . This information has been verified and is true and correct to the best of our knowledge.

Location	Date	Initiated by	Approved by
8989 Monroe Houston, Texas 77063	5/3/2017	Anabel Ramirez QA	David Suffel QA Manager

ForgitalUSA
FORGITALGROUP

CERTIFIED MATERIAL TEST REPORT

MTR # 35164

APPROVED
By 103758 at 9:49 am, 3/24/17

MS-021012-02-02 REV 08

Sales Order Number	79694-00	**Item**	1
Purchase Order	4511368922	**Customer**	CAMERON ENGINEERED VALVES
Specification	MS-021012-02	**Country of Origin:**	ITALY
Requirements		**State Of Delivery:**	Quench and Tempered
Material	ASTM A350 LF2 Cl 1 (UNS K03011)	**Drawing:**	X-057356-01 REV.02
Article	30" 600 FE (FE630)	**Part Number:**	508960-30-06-01 R.03
Heat - Supplier	246613 VEN	**Quantity:**	2
Serial Number	IF 1197 3091/16-01/00	**Test Number**	QT246613

Chemical Composition %

Melting Practice: E.F.V.D.

	C	Mn	Si	P	S	Cr	Ni	Mo	Cu	SN	AL
Required	≤ .21	0.6-1.35	.15 - .30	≤ 0.030	≤0.030	≤0.30	≤0.40	≤0.12	≤ 0.40		
Ladle	0.176	1.222	0.224	0.008	0.007	0.137	0.119	0.019	0.159	0.006	0.031
Product	—	—	—	—	—	—	—	—	—		

	Nb	V	Ti	Co	B	As	Sb	H	N	Ceq IIW	Cr+Mo	1*
Required	≤ 0.020	≤ 0.050								≤	≤ 0.32	≤ 1.00
Ladle	0.001	0.001	0.002			0.005		1.6	81	0.43	0.156	0.435
Product	—	—	---	---	—				---	—	---	---

*1 Cu + Ni + Cr + V + Mo 1.00 max.

Heat Treatment

Austenitized: 1650F HELD 4HRS, WATER QUENCHED
Tempered at: 1100F HELD 6HRS, AIR COOLED
Water Temp: Start 54 °F, End 82 °F

Hardness on Pieces

HB Required (min/max) 143-197 10/3000 HBW HB Obtained (min/max) 151-161 HBW

Mechanical Properties

MS-021000-01

Specimen demension for Tensile test		Specimen dimension for Impact test		
.500 (inch)	2" Length (inch)		(10mm x 10mm)	Length (55mm)

Tensile Test		UTS - Rm	YS - Rp0,2%	Elong. - A	Red. of area - Z	Hardness HBW
Test number	Direction	483 - 559 MPa	≥ 277 MPa	≥ 22%	≥ 30%	143-197
Q246613	LONG	532	345	36.1	65.3	153

Impact tests

Test n	Temperature	Direction	KV Energy J	27/21 J		Lateral expansion			Shear fracture
QT246613	-50° F.	LONG	98	100	95	0.041	0.04	0.042	

QTC size 4 X 4 X 8 min. Heat Treated per requirement. Grain size 6-8. Better than 4:1 hot work ratio. 10/3000 HBW

Notes: Din 50049 3.1.b, EN 10204 3.1.b; EN 10204: 2004 3.1; ISO 10474 3.1.b; Forged in Italy, Heat Teated in Houston, Tx.; API 6A, Annex M, 20th Ed.; API 6D Annex F 24th Ed.; Furnace T/C; ASTM E10; ASTM A961; NACE MR 01 75

Forgital USA Inc. certifies that the material provided complies with all of CCV requirements as stated in the applicable P.O . This information has been verified and is true and correct to the best of our knowledge.

Location	Date	Initiated by	Approved by
8989 Monroe Houston, Texas 77063	3/23/2017	Anabel Ramirez QA	David Suffel QA Manager

CAMERON
A Schlumberger Company

257 Holloway Boulevard
Ville Platte, LA 70586-9778
Tel: 337-363-7500
Fax: 337-363-7516

Testing Report

Production Order: 121092078
Part Number: CAM-BV Rev: 01
End Connections: RF x RF
Bore Type: Full
Test Date: 1/11/2018
Test Type: Test
Seat Type: DBB
Comments:

Serial Number: 1
Valve Type: T31
Valve Size: 30
ANSI Class: 600
Overall Valve Length: 65.0000 Inches
Overall Result: Pass
Tested With Pup Pipe: No
Tested With Extension: No

Test Procedure:	BX-1200-8-95	Rev: 12	Test Procedure:		Rev:
Test Procedure:		Rev:	Test Procedure:		Rev:
Test Procedure:		Rev:	Test Procedure:		Rev:
Test Procedure:		Rev:	Test Procedure:		Rev:
Test Procedure:		Rev:	Test Procedure:		Rev:

Hydro Test

Tester: 27520 - Patrick George
Workcenter: 92726 - Cam 14-42
Gage #: BV-5026 Due Date: 3/18/2018
Gage #: Due Date:
Gage #: Due Date:
Test Medium: Water, Glycol, Rust Inhibitor

Low Pressure Body:	1	Min @	40/80	PSI	Result:	Pass
Hydro Body:	30	Min @	2225	PSI	Result:	Pass
Seat A:	10	Min @	1650	PSI	Result:	Pass
Seat B:	10	Min @	1650	PSI	Result:	Pass
DoubleBlock:	10	Min @	1650	PSI	Result:	Pass

Are Charts Required? No

Is Cavity Relief Test Required? No
Is Torque Test Required? No
Is Air Test Required? Yes

Air Test

Tester: 27520 - Patrick George
Workcenter: 92726 - Cam 14-42
Gage #: BV-160-150 Due Date: 2/6/2018
Gage #: Due Date:
Test Medium: Compressed Air

Air Seat A:	10	Min @	80	PSI	Result:	Pass
Air Seat B:	10	Min @	80	PSI	Result:	Pass
Air Seat DBB:	10	Min @	80	PSI	Result:	Pass

Are Charts Required? Yes
Chart Recorder #: BV-242A-970412
Due Date: 2/1/2018

Is Nitrogen Body Test Required? No
Is Nitrogen Seat Test Required? No
Is Drift Test Required? No
Is Function Test Required? No

CAMERON
A Schlumberger Company

Testing Report

257 Holloway Boulevard
Ville Platte, LA 70586-9778
Tel: 337-363-7500
Fax: 337-363-7516

Production Order: 121092078 Serial Number: 1

Shell Test – No visible leakage permitted.
Seat Leakage for soft seated valves – No visible leakage permitted.
Seat leakage for metal seated valves shall be as agreed upon with the customer, reference the applicable test procedure.

CAMERON
A Schlumberger Company

Testing Report

257 Holloway Boulevard
Ville Platte, LA 70586-9778
Tel: 337-363-7500
Fax: 337-363-7516

Production Order:	121092078	Serial Number:	2
Part Number:	CAM-BV Rev: 01	Valve Type:	T31
End Connections:	RF x RF	Valve Size:	30
Bore Type:	Full	ANSI Class:	600
Test Date:	1/11/2018		
Test Type:	Test	Overall Valve Length:	65.0000 inches
Seat Type:	DBB	Overall Result:	Pass
Comments:		Tested With Pup Pipe:	No
		Tested With Extension:	No

Test Procedure:	BX-1200-08-95	Rev: 12	Test Procedure:		Rev:
Test Procedure:		Rev:	Test Procedure:		Rev:
Test Procedure:		Rev:	Test Procedure:		Rev:
Test Procedure:		Rev:	Test Procedure:		Rev:
Test Procedure:		Rev:	Test Procedure:		Rev:

Hydro Test

Tester: 92068 - Dusty Bazar Workcenter: 318161 - Cam 14-42

Gage #:	1255505	Due Date:	4/9/2018
Gage #:	1258009	Due Date:	4/9/2018
Gage #:		Due Date:	

Test Medium: Water, Glycol, Rust Inhibitor

Low Pressure Body:	1	Min @	40/80	PSI	Result:	Pass
Hydro Body:	30	Min @	2225	PSI	Result:	Pass
Seat A:	10	Min @	1650	PSI	Result:	Pass
Seat B:	10	Min @	1650	PSI	Result:	Pass
DoubleBlock:	10	Min @	1650	PSI	Result:	Pass

Are Charts Required? No

Is Cavity Relief Test Required? No

Is Torque Test Required? No

Is Air Test Required? Yes

Tester: 92068 - Dusty Bazar Workcenter: 318161 - Cam 14-42

Gage #:	BV-160-144	Due Date:	3/18/2018
Gage #:	BV-160-149	Due Date:	3/18/2018

Test Medium: Compressed Air

Air Seat A:	10	Min @	80	PSI	Result:	Pass
Air Seat B:	10	Min @	80	PSI	Result:	Pass
Air Seat DBB:	10	Min @	80	PSI	Result:	Pass

Are Charts Required? Yes Chart Recorder #: BV-242A-970411 Due Date: 1/11/2018

Is Nitrogen Body Test Required? No

Is Nitrogen Seat Test Required? No

Is Drift Test Required? No

Is Function Test Required? No

CAMERON
A Schlumberger Company

Testing Report

257 Holloway Boulevard
Ville Platte, LA 70586-9778
Tel: 337-363-7500
Fax: 337-363-7516

Production Order: 121092078

Serial Number: 2

Shell Test – No visible leakage permitted.
Seat Leakage for soft seated valves – No visible leakage permitted.
Seat leakage for metal seated valves shall be as agreed upon with the customer, reference the applicable test procedure.

CAMERON
A Schlumberger Company

Testing Report

257 Holloway Boulevard
Ville Platte, LA 70586-9778
Tel: 337-363-7500
Fax: 337-363-7516

Production Order: 121092078
Part Number: CAM-BV Rev: 01
End Connections: RF x RF
Bore Type: Full
Test Date: 1/11/2018
Test Type: Test
Seat Type: DBB
Comments:

Serial Number: 3
Valve Type: T31
Valve Size: 30
ANSI Class: 600
Overall Valve Length: 65.0000 inches
Overall Result: Pass
Tested With Pup Pipe: No
Tested With Extension: No

Test Procedure:	BX-1200-8-95	Rev: 12	Test Procedure:		Rev:
Test Procedure:		Rev:	Test Procedure:		Rev:
Test Procedure:		Rev:	Test Procedure:		Rev:
Test Procedure:		Rev:	Test Procedure:		Rev:
Test Procedure:		Rev:	Test Procedure:		Rev:

Hydro Test

Tester: 27555 - Sherman Wilson
Workcenter: 318161 - Cam 14-42
Gage #: 1255505 Due Date: 4/9/2018
Gage #: 1258009 Due Date: 4/9/2018
Gage #: Due Date:
Test Medium: Water, Glycol, Rust Inhibitor

Low Pressure Body:	1	Min @	40/80	PSI	Result:	Pass
Hydro Body:	30	Min @	2225	PSI	Result:	Pass
Seat A:	10	Min @	1650	PSI	Result:	Pass
Seat B:	10	Min @	1650	PSI	Result:	Pass
DoubleBlock:	10	Min @	1650	PSI	Result:	Pass

Are Charts Required? No

Is Cavity Relief Test Required? No
Is Torque Test Required? No
Is Air Test Required? Yes

Air Test

Tester: 27555 - Sherman Wilson
Workcenter: 318161 - Cam 14-42
Gage #: BV-160-149 Due Date: 3/18/2018
Gage #: BV-160-148 Due Date: 3/18/2018
Test Medium: Compressed Air

Air Seat A:	10	Min @	80	PSI	Result:	Pass
Air Seat B:	10	Min @	80	PSI	Result:	Pass
Air Seat DBB:	10	Min @	80	PSI	Result:	Pass

Are Charts Required? Yes
Chart Recorder #: BV-242A-970412 Due Date: 2/1/2018

Is Nitrogen Body Test Required? No
Is Nitrogen Seat Test Required? No
Is Drift Test Required? No
Is Function Test Required: No

CAMERON
A Schlumberger Company

Testing Report

257 Holloway Boulevard
Ville Platte, LA 70586-9778
Tel: 337-363-7500
Fax: 337-363-7516

Production Order: 121092078

Serial Number: 3

Shell Test – No visible leakage permitted.
Seat Leakage for soft seated valves – No visible leakage permitted.
Seat leakage for metal seated valves shall be as agreed upon with the customer, reference the applicable test procedure.