



Wednesday Dec-03-2014

**From:**

Cameron Canada Corporation  
3707 97 St.

Edmonton, Alberta, Canada  
T6E 6J2  
780-468-2732

[www.c-a-m.com](http://www.c-a-m.com)

**To:**

..

**Subject:**

Serial: 120403145

Quantity/Series: 25

**Comment:**

**Part Number:** 5A-T3F05S20LZ3

**Description:** BV F05 FNPT NUTRON T3 2000 WOG SOUR LT

**Sales Order:** N/A

**Purchase Order:** N/A



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3707 97 St.  
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## Document Summary Page

The MTR's are printed in the following order:

| # | Heat #     | Heat Code | Part Description                            | Product           |
|---|------------|-----------|---------------------------------------------|-------------------|
| 1 | L          | LOC       | Nutron T3, B3, B2, TT Sour Low Temp.        | --LOC             |
| 2 | Hydro Test | 598       | API 598                                     | -Hydro Test       |
| 3 | D93D906    |           | BODY, 1/2" 6000 WOG T3                      | 5A-10000532600    |
| 4 | Z93D829    |           | CAP, 1/2" FP 4000 WOG FNPT, ASTM A350 GR    | 5A-1020100531400  |
| 5 | R6171      |           | STEM, 1/2" ,ANTI-STATIC, ASTM A564 17-4     | 5A-11300513617001 |
| 6 | S8254      |           | BALL, 1/2" ,MODEL T3/B3E, ASTM A479 (LATEST | 5A-11500510617015 |

**VALVES & MEASUREMENT**

Cameron Canada Corporation  
3707 - 97 Street  
Edmonton Alberta Canada T6E 6J2  
Phone 780.463.6868  
Fax 780.465.1244  
www.c-a-m.com

**GENERAL LETTER OF COMPLIANCE**

for:

**Nutron Models  
T3, B3 & B2 & TT**

**Style 'L': Sour Low Temperature Service**

Cameron Valves & Measurement hereby certifies that the design, fabrication, testing and quality control of the above NUTRON brand ball valves for Sour Low Temperature Service have been made in accordance with the following applicable standards (latest edition in effect at time of manufacture): API 598 (1-1/2" and smaller), API 6D (TT only), ASME B16.34, CSA Z245.15 Sour Service (2" FP and larger) and V&M Engineering Standards. As part of compliance to these specifications, the valves have been marked in accordance with MSS SP-25. The valve has also been marked "SOUR" as required by CSA Z245.15 marking requirements for Sour Service.

The materials of construction for this valve conform to the metallurgical requirements of NACE MR0175/ISO 15156:2009 (Parts 1 & 2 for Carbon & Alloy Steels in SSC Region 3 Sour Service and Parts 1 & 3 for CRA's as specified in CSA Z245.15 Chapter 13). Per NACE MR0175-2009/ISO 15156, it is the customer's/user's responsibility to ensure that the valve materials will be satisfactory in the intended service.

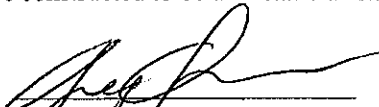
The minimum service temperature of these valves is -46°C/-50°F. Impact testing has been performed in accordance with applicable ASTM requirements and those of CSA Z245.15 for Category II M45C Service.

The 'Z' option code designation at the end of a figure number indicates that the valve meets the requirements of API-607 Fourth Edition, May 1993.

These valves (1-1/2" and larger) conform to the Pressure Equipment Directive requirements and are marked as CE certified (Certificate #8888-001-2002).

The B2 and TT valve models are constructed to be anti-static as standard.

Approved by:

  
Greg Ogarko, M.Eng., P.Eng.  
Engineering Manager

**VALVES & MEASUREMENT**

Cameron Canada Corporation  
3707-97th St.  
Edmonton Alberta Canada T6E 6J2  
Phone 780.468.2732  
www.c-a-m.com

**CERTIFICATE OF CONFORMANCE****API 598 Pressure Testing – Carbon Steel  
(2" RP and Smaller)**

**COMPLIANCE:** These valves are tested in accordance with Cameron Valves & Measurement's standard procedures and API Standard 598, as per the chart below.

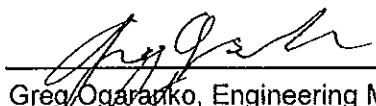
Test durations are 15 seconds in length as a minimum. Test duration is defined as the period of inspection after the valve is fully prepared and is under full pressure.

Butt weld end valves shall be tested in accordance with the ANSI rating.

Actual test pressure is rounded to next highest increment on the gauge.

**Carbon Steel  
Shell and Seat Test Pressures**  
(Table Based on Rating for Group 1.1 Materials per ANSI B16.34)

| Valve Class | Maximum Working Pressure | Hydrostatic Shell Test Pressure (PSI) | Air Seat Test Pressure +/- 10 PSI |
|-------------|--------------------------|---------------------------------------|-----------------------------------|
| 150 ANSI    | 285                      | 450                                   | 80                                |
| 300 ANSI    | 740                      | 1125                                  | 80                                |
| 600 ANSI    | 1480                     | 2225                                  | 80                                |
| 800 ANSI    | 1975                     | 3000                                  | 80                                |
| 900 ANSI    | 2220                     | 3350                                  | 80                                |
| 1500 ANSI   | 3705                     | 5575                                  | 80                                |
| 2500 ANSI   | 6170                     | 9275                                  | 80                                |
| 275 WOG     | 275                      | 425                                   | 80                                |
| 720 WOG     | 720                      | 1100                                  | 80                                |
| 1000 WOG    | 1000                     | 1500                                  | 80                                |
| 1440 WOG    | 1440                     | 2175                                  | 80                                |
| 1500 WOG    | 1500                     | 2250                                  | 80                                |
| 2000 WOG    | 2000                     | 3000                                  | 80                                |
| 2160 WOG    | 2160                     | 3250                                  | 80                                |
| 3000 WOG    | 3000                     | 4500                                  | 80                                |
| 3600 WOG    | 3600                     | 5400                                  | 80                                |
| 4000 WOG    | 4000                     | 6000                                  | 80                                |
| 5000 WOG    | 5000                     | 7500                                  | 80                                |
| 6000 WOG    | 6000                     | 9000                                  | 80                                |

  
Greg Ogarko, Engineering Manager

# Campex Inc.

PART No. 5A-10000532600 Rev. 02  
 PRODUCT BODY, 1/2" 6000 WOG  
 PO No. 4510362093  
 QTY 4500  
 MATERIAL: ASTM A350 Gr. LF2  
 MS-021009-01-03 Rev.01

CHECKED BY: LIU NING  
 APPROVED BY: ZHANG ZENGKUI  
 REPORTED DATE: JULY 31, 2014

## CHEMICAL COMPOSITION

## MECHANICAL PROPERTY TEST REPORT

| No.   | LT/N | HT/N | QTY<br>(PCS) | We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and EN 10204 3.1. |      |      |       |       |      |      |      |      |      |      |      | YIELD<br>STRESS<br>(Mpa) | TENSILE<br>STRESS<br>(Mpa) | EL<br>(%) | ROA<br>(%) | (J) -46°C   | HB          | Quenching    |             |              |             | Tempering    |             |
|-------|------|------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|-------|-------|------|------|------|------|------|------|------|--------------------------|----------------------------|-----------|------------|-------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|
|       |      |      |              | C                                                                                                                                                           | Si   | Mn   | P     | S     | Cr   | Ni   | Cu   | V    | Mo   | Nb   | CE   |                          |                            |           |            |             |             | Temp<br>(°C) | Time<br>(h) | Temp<br>(°C) | Time<br>(h) | Temp<br>(°C) | Time<br>(h) |
| 1     | D93  | D906 | 4422         | 0.17                                                                                                                                                        | 0.20 | 0.88 | 0.006 | 0.005 | 0.06 | 0.03 | 0.03 | 0.05 | 0.00 | 0.02 | 0.34 | 415                      | 527                        | 33        | 73         | 182/262/290 | 154/187/168 | 920          | 2           | 800          | 2           | 700          | 2           |
| 2     | D93  | D887 | 78           | 0.17                                                                                                                                                        | 0.20 | 0.88 | 0.006 | 0.005 | 0.06 | 0.03 | 0.03 | 0.05 | 0.00 | 0.02 | 0.34 | 394                      | 502                        | 29        | 79         | 198/196/200 | 156/162/158 | 920          | 2           | 800          | 2           | 700          | 2           |
|       |      |      |              |                                                                                                                                                             |      |      |       |       |      |      |      |      |      |      |      |                          |                            |           |            |             |             |              |             |              |             |              |             |
|       |      |      |              |                                                                                                                                                             |      |      |       |       |      |      |      |      |      |      |      |                          |                            |           |            |             |             |              |             |              |             |              |             |
|       |      |      |              |                                                                                                                                                             |      |      |       |       |      |      |      |      |      |      |      |                          |                            |           |            |             |             |              |             |              |             |              |             |
|       |      |      |              |                                                                                                                                                             |      |      |       |       |      |      |      |      |      |      |      |                          |                            |           |            |             |             |              |             |              |             |              |             |
|       |      |      |              |                                                                                                                                                             |      |      |       |       |      |      |      |      |      |      |      |                          |                            |           |            |             |             |              |             |              |             |              |             |
|       |      |      |              |                                                                                                                                                             |      |      |       |       |      |      |      |      |      |      |      |                          |                            |           |            |             |             |              |             |              |             |              |             |
| TOTAL |      |      | 4500         |                                                                                                                                                             |      |      |       |       |      |      |      |      |      |      |      |                          |                            |           |            |             |             |              |             |              |             |              |             |

Mechanical Property testing performed after heat treatment using standard round 2" specimen.  
 Testing performed by Shandong Molong Petroleum Machinery Co., Ltd.



# Campex Inc.

PART No. 5A-1020100531400 Rev. 03  
 PRODUCT CAP, 1/2" FP 4000 WOG FNPT  
 PO No. 4510292133  
 QTY 4219

CHECKED BY: LIU NING  
 APPROVED BY: ZHANG ZENGKUI  
 REPORTED DATE: APRIL 24, 2014

MATERIAL: ASTM A350 Gr. LF2 / A105N

## CHEMICAL COMPOSITION

## MECHANICAL PROPERTY TEST REPORT

| No.   | LT/N | HT/N | QTY<br>(PCS) | We certify that the items referenced in this document were manufactured and tested in accordance with Cameron Purchase Order requirements and EN 10204 3.1. |      |      |       |       |      |      |      |      |      |      |      | YIELD<br>STRESS<br>(Mpa) | TENSILE<br>STRESS<br>(Mpa) | EL<br>(%) | ROA<br>(%) | (J) -46°C   | HB          | Quenching    |             |              |             | Tempering    |             |
|-------|------|------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|-------|-------|------|------|------|------|------|------|------|--------------------------|----------------------------|-----------|------------|-------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|
|       |      |      |              | C                                                                                                                                                           | Si   | Mn   | P     | S     | Cr   | Ni   | Cu   | V    | Mo   | Nb   | CE   |                          |                            |           |            |             |             | Temp<br>(°C) | Time<br>(h) | Temp<br>(°C) | Time<br>(h) | Temp<br>(°C) | Time<br>(h) |
| 1     | Z93  | D788 | 21           | 0.17                                                                                                                                                        | 0.20 | 0.88 | 0.006 | 0.005 | 0.06 | 0.03 | 0.03 | 0.05 | 0.00 | 0.02 | 0.34 | 378                      | 517                        | 33        | 71         | 164/208/230 | 150/154/152 | 920          | 2           | 800          | 2           | 700          | 2           |
| 2     | Z93  | D829 | 4198         | 0.17                                                                                                                                                        | 0.20 | 0.88 | 0.006 | 0.005 | 0.06 | 0.03 | 0.03 | 0.05 | 0.00 | 0.02 | 0.34 | 381                      | 526                        | 32        | 75         | 224/232/236 | 146/158/152 | 920          | 2           | 800          | 2           | 700          | 2           |
|       |      |      |              |                                                                                                                                                             |      |      |       |       |      |      |      |      |      |      |      |                          |                            |           |            |             |             |              |             |              |             |              |             |
|       |      |      |              |                                                                                                                                                             |      |      |       |       |      |      |      |      |      |      |      |                          |                            |           |            |             |             |              |             |              |             |              |             |
|       |      |      |              |                                                                                                                                                             |      |      |       |       |      |      |      |      |      |      |      |                          |                            |           |            |             |             |              |             |              |             |              |             |
| TOTAL |      |      | 4219         |                                                                                                                                                             |      |      |       |       |      |      |      |      |      |      |      |                          |                            |           |            |             |             |              |             |              |             |              |             |

Mechanical Property testing performed after heat treatment using standard round 2" specimen.  
 Testing performed by Shandong Molong Petroleum Machinery Co., Ltd.

**Cameron Approved**

By: 101718 Date: 05/29/14 8:38



ISO 9001  
No. 01 100 029186

# 原 璋 實 業 有 限 公 司

WON ZONE CORPORATION

3F No. 185 Chung Hwa Road Sec. 2, Chung Li City 32068, Taiwan

32068 桃園縣中壢市中華路二段 185 號 3 樓 統一編號: 16879927

Tel: +886-3-4341 325 Fax: +886-3-4341 525 E-mail: wonzone.taiwan@msa.hinet.net

| CERTIFICATE OF CHEMICAL ANALYSIS<br>AND MECHANICAL PROPERTIES                                       |                             |             |           | CERTIFICATE NO. 140922- 1<br>DATE: 22-Sep-14         |                      |                   |              |                  |                          |           |
|-----------------------------------------------------------------------------------------------------|-----------------------------|-------------|-----------|------------------------------------------------------|----------------------|-------------------|--------------|------------------|--------------------------|-----------|
| To, CAMERON CANADA CORPORATION<br>3707-97th Street, EDMONTON, AB T6E 6J2, CANADA                    |                             |             |           |                                                      |                      |                   |              |                  |                          |           |
| INVOICE NO. WZ-140922A                                                                              |                             |             |           | Your Order No.4510433136/471620/471657/500141/507022 |                      |                   |              |                  |                          |           |
| MATERIAL SPECIFICATION: ASTM A-564 TYPE 630 H1150D                                                  |                             |             |           |                                                      |                      |                   |              |                  |                          |           |
| Q'TY                                                                                                | PART NAME                   | DRAWING No. | Heat Code | Mechanical Properties                                |                      |                   |              |                  |                          |           |
|                                                                                                     |                             |             |           | Y.S.(KSI)<br>105 min                                 | T.S.(KSI)<br>125 min | ELO.(%)<br>16 min | HRC<br>29~33 | RA (%)<br>50 min | ft-lbf (-75°F)<br>15 min |           |
| 5,400                                                                                               | 5A-11300513617001 Stem ½"   | #02039      | R6171     | 129                                                  | 137                  | 21                | 32           | 69               | 89/88/91                 |           |
| 2,320                                                                                               | 5A-11301013617001 Stem 7/8" | #02040      | R6102     | 122                                                  | 140                  | 21                | 32           | 70               | 90/87/89                 |           |
| 1,191                                                                                               | 5A-11301513617001 Stem 1½"  | #02038      | FO        | 127                                                  | 138                  | 22                | 32           | 72               | 96/86/100                |           |
| 9                                                                                                   | 5A-11301513617001 Stem 1½"  | #02038      | FD        | 124                                                  | 139                  | 21                | 32           | 67               | 83/86/88                 |           |
| 200                                                                                                 | 5A-11302013617001 Stem 2"   | #02041      | FH        | 126                                                  | 138                  | 22                | 33           | 69               | 92/86/88                 |           |
| 1,400                                                                                               | 5A-11500513617015 Ball 1/2" | #06076      | S8301     | 130                                                  | 143                  | 22                | 32           | 66               | 83/78/76                 |           |
| 180                                                                                                 | 5A-11501013617026 Ball 7/8" | #06082      | S8252     | 119                                                  | 137                  | 23                | 30           | 69               | 120/105/113              |           |
| 317                                                                                                 | 5A-11502013617015 Ball 2"   | #06080      | S8306     | 121                                                  | 135                  | 20                | 32           | 71               | 72/78/80                 |           |
| Heat Code                                                                                           | Chemical Composition (%)    |             |           |                                                      |                      |                   |              |                  |                          |           |
|                                                                                                     | C                           | Mn          | Si        | S                                                    | P                    | Cr                | Ni           | Mo               | Cu                       | Nb+Ta     |
|                                                                                                     | 0.07max                     | 1.0max      | 1.0max    | .030max                                              | .040max              | 15-17.5           | 3.0-5.0      | 0.5 max          | 3.0-5.0                  | 0.15-0.45 |
| R6171                                                                                               | 0.02                        | 0.64        | 0.49      | 0.023                                                | 0.029                | 15.04             | 4.36         | 0.19             | 3.40                     | 0.23      |
| R6102                                                                                               | 0.03                        | 0.64        | 0.47      | 0.018                                                | 0.030                | 15.40             | 4.27         | 0.13             | 3.46                     | 0.23      |
| FO                                                                                                  | 0.02                        | 0.63        | 0.51      | 0.023                                                | 0.029                | 15.17             | 4.32         | 0.18             | 3.40                     | 0.23      |
| FD                                                                                                  | 0.02                        | 0.62        | 0.44      | 0.023                                                | 0.031                | 15.16             | 4.39         | 0.14             | 3.51                     | 0.21      |
| FH                                                                                                  | 0.02                        | 0.64        | 0.49      | 0.023                                                | 0.029                | 15.04             | 4.36         | 0.19             | 3.40                     | 0.23      |
| S8301                                                                                               | 0.02                        | 0.62        | 0.44      | 0.023                                                | 0.031                | 15.16             | 4.39         | 0.14             | 3.51                     | 0.21      |
| S8252                                                                                               | 0.02                        | 0.72        | 0.36      | 0.024                                                | 0.023                | 15.38             | 4.67         | 0.10             | 3.30                     | 0.28      |
| S8306                                                                                               | 0.02                        | 0.72        | 0.36      | 0.024                                                | 0.023                | 15.38             | 4.67         | 0.10             | 3.30                     | 0.28      |
| Solution Treatment: 1900°F for 30 Min/Inch (Minimum of 1 Hour), Fast Air Cooling to below 90°F      |                             |             |           |                                                      |                      |                   |              |                  |                          |           |
| Double Aged at 1150°F for 4 hours minimum and cooled to below 90°F in air                           |                             |             |           |                                                      |                      |                   |              |                  |                          |           |
| Charpy Impact Test Specimens: 10*10*55mm(Longitudinal)                                              |                             |             |           |                                                      |                      |                   |              |                  |                          |           |
| Re Orig Heat #SE0302-GF0 for R6171; #SD2215-GJ0 for R6102; #SE0082-BA2 for FO; #SD2214-G701 for FD; |                             |             |           |                                                      |                      |                   |              |                  |                          |           |
| #SE0302-GM0 for FH; #SD2214-G90 for S8301; #9SD0304-G13 for S8252; #9SD0304-GP0 for S8306           |                             |             |           |                                                      |                      |                   |              |                  |                          |           |
| NOTE: CERTIFICATE ACCORDING TO EN 10204/3.1B                                                        |                             |             |           |                                                      |                      |                   |              |                  |                          |           |
| QUALITY CONTROL INSPECTOR                                                                           |                             |             |           |                                                      |                      | MANAGER           |              |                  |                          |           |
| Sandy Yeh                                                                                           |                             |             |           |                                                      |                      | Grant Hsu         |              |                  |                          |           |

**APPROVED**

By lala at 1:07 pm, 10/15/14



ISO 9001  
No. 01 100 029186

原 璋 實 業 有 限 公 司

WON ZONE CORPORATION

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32068 桃園縣中壢市中華路二段 185 號 3 樓 統一編號: 16879927

Tel: +886-3-4341 325 Fax: +886-3-4341 525 E-mail: wonzone.taiwan@msa.hinet.net

| CERTIFICATE OF CHEMICAL ANALYSIS<br>AND MECHANICAL PROPERTIES                    |                           |               |               |                       | CERTIFICATE NO. 140922- 7<br>DATE: 22-Sep-14 |                     |                     |                |      |  |  |
|----------------------------------------------------------------------------------|---------------------------|---------------|---------------|-----------------------|----------------------------------------------|---------------------|---------------------|----------------|------|--|--|
| To. CAMERON CANADA CORPORATION<br>3707-97th Street, EDMONTON, AB T6E 6J2, CANADA |                           |               |               |                       |                                              |                     |                     |                |      |  |  |
| INVOICE NO. WZ-140922A                                                           |                           |               |               |                       | YOUR ORDER NO. 4510471657                    |                     |                     |                |      |  |  |
| Material Specification: ASTM A479 type:316                                       |                           |               |               |                       | Heat Treatment: Solution Annealed            |                     |                     |                |      |  |  |
| Q'TY                                                                             | PART NAME                 | DRAWING No.   | Heat Code     | Mechanical Properties |                                              |                     |                     |                |      |  |  |
|                                                                                  |                           |               |               | Y.S.(Mpa)             | T.S.(Mpa)                                    | EL.O.(%)            | RA(%)               | HB             |      |  |  |
| 2,980                                                                            | 5A-11500510617015 Ball ½" | #06076        | S8254         | <u>205 min</u><br>236 | <u>515 min</u><br>590                        | <u>30 min</u><br>56 | <u>40 min</u><br>78 | ....<br>156    |      |  |  |
| Heat<br>Code                                                                     | Chemical Composition (%)  |               |               |                       |                                              |                     |                     |                |      |  |  |
|                                                                                  | C                         | Mn            | Si            | S                     | P                                            | Cr                  | Ni                  | Mo             | N    |  |  |
| S8254                                                                            | <u>0.08max</u>            | <u>2.0max</u> | <u>1.0max</u> | <u>.030max</u>        | <u>.045max</u>                               | <u>16-18</u>        | <u>10-14</u>        | <u>2.0-3.0</u> | ...  |  |  |
|                                                                                  | 0.029                     | 1.08          | 0.33          | 0.001                 | 0.034                                        | 16.30               | 10.13               | 2.04           | 0.05 |  |  |
| Re: Orig Heat # 9SC0103-LE2                                                      |                           |               |               |                       |                                              |                     |                     |                |      |  |  |
| NOTE: CERTIFICATE ACCORDING TO EN 10204/3.1B                                     |                           |               |               |                       |                                              |                     |                     |                |      |  |  |
| QUALITY CONTROL INSPECTOR                                                        |                           |               |               |                       |                                              | MANAGER             |                     |                |      |  |  |
| Sandy Yeh                                                                        |                           |               |               |                       |                                              | Grant Hsu           |                     |                |      |  |  |

**APPROVED**

By Iala at 3:03 pm, 10/15/14