



Score (Europe) Limited
The Paragon Works
Woodend Place
Cowdenbeath
Fife
KY4 8EE
Scotland
U.K.
Tel: +44 (0) 1383 510510 Fax: +44 (0) 1383 514512
E-mail: customersupport@score-group.com
Web: www.score-group.com

FIRE TEST REPORT

IN ACCORDANCE WITH
ISO 10497:2010(E), Third Edition February 2010
&
ANSI/API Standard 607 Fifth Edition June 2005

CUSTOMER: Stewart-Buchanan Gauges Ltd.
CONTACT: S Ross
P.O. NUMBER: 10801441-2
VALVE: 19mm Ø Bore, 300#, Double Block & Bleed Valve

Report Compiled By: **D. Wood**
Score Job Number: **242044 COW**

Date: **21/05/10**
Report No: **242044-1**



242044-1



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INVESTOR IN PEOPLE



Specialised Valve Fire and Cryogenic Test facility

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VALVE DETAILS AND TEST PREPARATION

On 21st May 2010 at Score (Europe) Limited, Cowdenbeath, Fife, Scotland, a Fire Test to ISO 10497:2010(E), Third Edition February 2010 and ANSI/API Standard 607, Fifth Edition June 2005 was carried out on behalf of Stewart-Buchanan Gauges Ltd.

The valve was selected and supplied by the manufacturer Stewart-Buchanan Gauges Ltd.

Details

Needle Valve not tested

Type:	DB & B Ball Valve	Score Report No:	242044-1
Manufacturer:	Stewart-Buchanan Gauges Ltd.	Size:	19mm Ø Bore
Full or Reduced Bore:	Full	Rating:	300
Serial No:	10902097/1-1	Drawing No:	7900445 Rev 0 (dated 13/11/09)

Material:

Body/End Piece: **316 SS**
Seal: **Graphoil**
Seat: **Peek**

Markings on Valve:

SV Ref: **10902097**
Body Cert Ref: **215W**
Score URN: **242044-0001**
Other: **7900445 Rev 0**

Test Preparation

The valve was removed from transportation package and the above information correlated from the Manufacturer's nameplate/valve body. At the same time the Manufacturer's Test Certificate was checked to ensure the valve has passed their standard production pressure testing. Valve was previously hard stamped with Score Unique Number 242044-0001. Valve mounted into test stand with calorimeter cubes and flame environment thermocouples in their appropriate locations as per the standard, these in turn being connected through a Chessell Temperature & Pressure Recorder with automatic data storage facilities. The inlet/outlet pipe work was connected to the valve. With the valve in the partially open position the system was checked for leaks by pressurising to 1.4 times the maximum permissible working pressure at 20°C.



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TEST REPORT

<u>TIME</u>	<u>DESCRIPTION</u>	<u>ACTUAL LEAKAGE IN ML/MIN</u>
<u>13:22 – 13:52</u>	Through seat leakage at test pressure of 2 BARG during burn period of 30 min. - (measured 470 ml) Allowable 80 ml/min.	15.67 ml/min.
<u>13:54 – 14:01</u>	Cool down period took 7 minutes for skin temperature to reach 100°C.	
<u>13:22 – 14:01</u>	External leakage during the burn and cool down period - (measured Zero ml) Allowable 20 ml/min.	Zero ml/min.
<u>14:01 – 14:06</u>	Through seat leakage on low pressure test at 2 BARG for 5 mins (measured Zero ml) Allowable 32 ml/min.	Zero ml/min.
<u>14:09 – 14:14</u>	External leakage at 37 BARG in open position following operational test for 5 mins (measured Zero ml) Allowable 20 ml/min.	Zero ml/min.

Test concluded at this point.



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ABERDEEN OFFICE
LLOYD'S REGISTER EMEA

V. Garfield

25 MAY 2010



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TEST RESULTS

Calorimeter cubes and flame environment thermocouples temperature checks.

Probe numbers 5 through 10 plus 12 (11 not used).

Burner ignited 13:22.

<u>No.5</u>	<u>No.6</u>	<u>No.7</u>	<u>No.8</u>
Top Body	Bonnet	Stem	Bottom
Thermocouple	Thermocouple	Flame	Flame
Temp.° C	Temp.° C	Temp.° C	Temp.° C
<u>No.9</u>	<u>No.10</u>	<u>No.11</u>	<u>No.12</u>
Stem	Bottom	Not Used	Body
Calor.Cube	Calor.Cube		Skin
Temp.° C	Temp.° C		Temp.° C

For the duration of this test all temperatures recorded complied with ISO 10497:2010(E) Third Edition February 2010 and ANSI/API Standard 607, Fifth Edition June 2005

Test and temperatures witnessed by Lloyd's Register EMEA.





Specialised Valve Fire and Cryogenic Test facility

TEST RESULTS

From the test results obtained, we confirm the valve tested has met the performance requirements stated in ISO 10497:2010(E) Third Edition February 2010 and ANSI/API Standard 607 Fifth Edition June 2005 and the test is therefore recorded as a PASS.

Range qualified by this test:

Size: 19mm Ø Bore

Rating: CLASS
300, 400, 600 & PN 40, 63, 100

Test Witnessed by:

W Campbell

S Fox
S Cerchiari
D Duncan

I Carson

Lloyd's Register EMEA

Score (Europe) Limited
Score (Europe) Limited
Score (Europe) Limited

Stewart-Buchanan Gauges Ltd.



FIRE TEST QUALIFICATION CERTIFICATE



Score (Europe) Ltd



Customer	Stewart-Buchanan Gauges Ltd.
Item	Double Block & Bleed Valve
Size	19mm Ø Bore
Class	300
PO No	10801441-2
Unique No	242044-0001
Serial No	10902097/1-1
Body Material	316 SS
Seat	Peek
Manufactured by	Stewart-Buchanan Gauges Ltd.
In accordance with job number	242044 COW
In accordance with drawing number	7900445 Rev 0, (dated 13/11/09)

The above valve was tested by Score (Europe) Ltd at their Specialised Valve Research and Test Centre, Cowdenbeath, Scotland and the results have been recorded as a PASS, having complied with the minimum performance requirements stated in

specification ISO 10497:2010(E), Third Edition February 2010 and ANSI/API Standard 607, Fifth Edition June 2005

Test date	21/05/10
Other sizes qualified	19mm Ø Bore
Other pressure ranges qualified	300, 400, 600 & PN 40, 63, 100

Tested by
S Fox / S Cerchiari

Witnessed by
W Campbell Lloyd's Register EMEA

This certificate must be read in conjunction with the full Score Test Report Number **242044-1**

Lloyd's Register Fire Test

Project: **Stewart Buchanan Gauges Ltd.**

Client: **Score Europe Ltd**

Office: **Aberdeen**

Clients Order Number: **104678**

Date: **25 May 2010**

Order Status: **Complete**

Inspection Dates

First: **21 May 2010**

Final: **25 May 2010**

This certificate is issued to **Score (Europe) Limited**, as at their request the undersigned Surveyors did attend their Works at **Woodend, Cowdenbeath, Fife**, for the purpose of witnessing a Fire Test on a **Double Block & Bleed Valve** stated to be manufactured by **Stewart Buchanan Gauges Ltd. Drawing Number 7900445 Rev 0 dated 13.11.2009 Order Number 10801441-2.**

Details of the valve are as follows:-

Size: 19mm Double Block & Bleed Ball Valve. Serial No. 10902097/1-1. (Needle valve not tested).

Class: ANSI 300.

Seat: Peek.

Body/End Piece: 316S/S.

Packing: Graphoil.

Valve stamped: Score Unique No. 242044-1.

Temperature thermocouples were placed as follows:-

5. "Top Body" Thermocouple °C.
6. "Bonnet" Thermocouple °C.
7. "Stem Flame" Temperature °C.
8. "Bottom Flame" Temperature °C.
9. "Stem Calorimeter Cube" Temperature °C.
10. "Bottom Calorimeter Cube" Temperature °C.
11. "Not used".
12. "Skin" Temperature. °C.

The Fire Test was carried out in accordance with ISO 10497:2010(E) Third Edition February 2010 and ANSI/API Standard 607 Fifth Edition June 2005 and Score Report Number 242044-1.

The valve was mounted into test stand with the Calorimeter Cubes and Flame Environment Thermocouples in their appropriate locations, which were connected to a Chessell Model 6180A temperature and pressure recorder, Serial Number GB-15998-1-1-0409-PL1 18 calibration of which was verified.



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All measuring and test equipment used was correctly calibrated.

Both the inlet and outlet pipe work were connected to the valve, with the valve in the partially open position the system was filled with water and the air purged out. The system was checked for leaks by pressurising to 1.4 times the maximum permissible working pressure and found tight.

During burn period the pressure was maintained at 2 Bar G by occasional manual adjustment.

On completion of the burn period of 30 minutes duration the valve was force cooled to 100°C.

Cool down took 7 minutes for skin temperature to reach 100°C.

The results of the Fire Test were then recorded as follows:-

Through seat leakage at test pressure of 2 Bar G during burn period over 30 minutes = 470 ml = 15.67 ml/min (allowable 80 ml/min).

External leakage (test pressure 2 Bar G) during burn and cool down period = 0 ml = 0 ml/min (allowable 20 ml/min).

Through seat leakage on low pressure test (test pressure 2 Bar G) after burn and cool down period over 5 minutes = 0 ml = 0 ml/min (allowable 32 ml/min).

External leakage with valve pressurised to 37 Bar G in fully open position over 5 minutes = 0ml = 0 ml/min (allowable 20 ml/min).

The test was concluded at this point.

The valve was dis-assembled and examined to verify compliance with Drawing Number 7900445 Rev 0 dated 13.11. 2009 and found to comply.

In respect of the test results now stated, it is considered that the valve complies with the requirements of ISO 10497:2010(E) Third Edition February 2010 and ANSI/API Standard 607 Fifth Edition June 2005. See Score Report Number 242044-1 for full details.

WL Campbell.
Surveyor to Lloyd's Register EMEA



A member of the Lloyd's Register Group