Certificate no.:	Project no.	Report date:	Office:
ABS-REP-70-102-2021-IT	N/A	12/05/2021	Busto Arsizio (VA)

Independent Third Party Inspection Certificate

Dati Fabbricante / Manufacturer identification			
Sede Legale / Unità Operativa Head Office / Plant	Bremer Valves s.r.l - Via Vignate 3/A 23890 Barzago (LC) Italy		
Tipologia / Type:	TRUNNION BALL VALVE SE 6" Class 1500		
Valve Body/ Terminal Material:	ASTM A350 Gr. LF2		
Ball Material:	UNS N06625		
Stem Material:	UNS N07718		
Seat Material:	UNS N06625 - PEEK		
Stud & Nuts Material:	ASTM A193 Gr. B7M/ ASTM A194 Gr.2HM		
Denominazione/ Denomination	**Marchio / Trademark:**	6" Class 1500 ASTM A350 Gr. LF2	
	Modelli / Models:	TRUNNION BALL VALVE – SIDE ENTRY TYPE	
Norma di riferimento Reference standard	**Prova / Test**		**Risultato / Result**
API 6FA 5th Ed.	Fire Safe Test Valve API 6A		Satisfactory
Laboratorio di prova: Test location:	Internal Testing		
GA Drawing No.:	R11-150150-FS Rev. 00		
Test Report No.:	05/2021		

Statement prepared and submitted without prejudice by:

Technical Representative
ABS Group LTD

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BREMER Valves s.r.l.

FIRE SAFE TEST REPORT 05/2021

According to:

API 6FA – 5th edition 2020

"Standard for Fire Test of Valves"

Tested item:

Trunnion side entry ball valve DN 6" #1500 RTJ full bore, body ASTM A350 LF2 trim INC 718/ INC 625

Dwg. R11-150150-FS dated 28/02/2009

Date and location

12/05/2021 - Barzago (LC), Italy

BREMER Valves s.r.l. – Cap. Soc. € 10.000 - C.F. - P.I. 03890250966 - Via Vignate 3/A - 23890 Barzago (LC) - Italy
Phone: 0039 031 860906– Fax 0039 031 8624462 - e-mail info@bremer.it

INTRODUCTION

On request of BREMER Valves srl, the ABS GROUP attended the fire safe testing detailed in this report at the manufacturer workshop located in Barzago, Italy.
This report only relates to the actual ball valves which was tested and assessed. The results obtained therefore do not necessarily relate to samples from the production line and in no way imply the performance on quality of the continuing production.

TESTED ITEM

Trunnion side entry ball valve DN 6" #1500 RTJ full bore
Body material: ASTM A350 LF2, ball and seats material: INC 625 and stem material: INC 718, Seat insert PEEK, body and stem sealing FKM AED / Flexible Graphite
Dwg. R11-050150-FS rev.0 dated 16/04/2020

SPECIFICATIONS

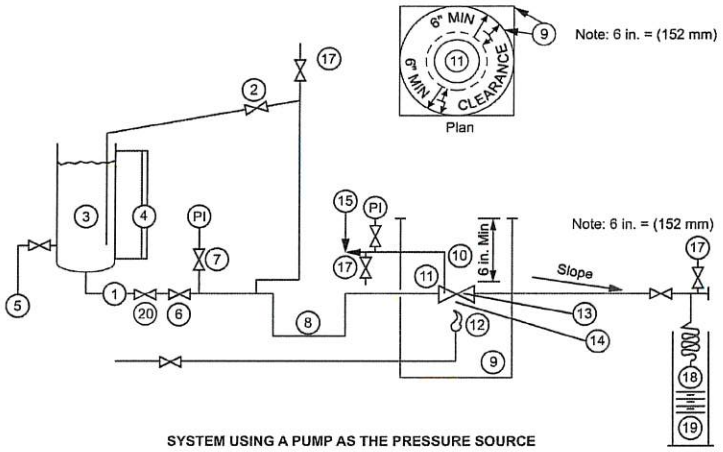
API 6FA – 5° ed. May 2020

TEST EQUIPMENT

The valves were tested in a test-rig similar to that described in API 6FA fig.1
In detail, it was composed by:

- Air-water high pressure pump as pressure source (1)
- Calibrated supply water tank (3)
- Vapour trap (8) to minimize cooling effect of upstream liquid
- Pressure gauge (7)
- Flame thermocouple and calorimeter cubes as described in figure 3 and located as shown in figure 1
- Calibrated device for measuring the leakage water collected during the test

Test fluid was clean water and test fuel was LPG.



SYSTEM USING A PUMP AS THE PRESSURE SOURCE

DN 150 to 300 NPS 6" to 12"
Class 1500, 2500

Considering that test procedure satisfies also the following:
ANSI/API Standard 607 – 7th edition, June 2016 "Fire Test for Quarter-turn Valves and Valves Equipped with Nonmetallic Seats"

ATTACHMENTS

- Dwg. R11-150150-FS Rev.0 dated 28/02/2009
- Temperature record

BREMER Valves s.r.l. – Cap. Soc. € 10.000 - C.F. - P.I. 03890250966 - Via Vignate 3/A - 23890 Barzago (LC) - Italy
Phone: 0039 031 860906– Fax 0039 031 8624462 - e-mail info@bremer.it

TEST PROCEDURE

The valve was in horizontal position, located in the flame environment, filled with water and in closed position.
The system was pressurized to 186 bar according to API 6FA Table 2(75% of maximum permissible working pressure at 20 °C), and this pressure was maintained during all burning period.
Burning period was 32 min.
Flame thermocouples and calorimeter cubes temperature, as well as testing pressure, was monitored and recorded during burning period. In detail, thermocouples reached 761 °C within 2 minutes from the start of the burning period, and average value was maintained between 761 and 980 °C, with no reading less than 704 °C (§4.4.1). The calorimeter cubes reached 650 °C within 15 minutes from the start of the burning period, and maintained at minimum average temperature of 650 °C with no reading less than 565 °C (§4.4.2.1.5).
Thermocouples / Calorimeters temperatures and test pressure were recorded every 30 seconds during burning period, and are tabulated and attached to this test report.
The water flowing through the valve during burning period was collected and recorded.
After burning period, the valve was cooled to a temperature less than 100 °C, and time and leakage recorded (§4.4.2.1.10).
Against high test pressure the valve was moved to fully open position, and torque recorded.
Shut-off valve 16 was closed, test valve moved to partially open position and pressure stabilized to high test pressure again, recording external leakage for a period of 5 minutes (§4.4.3.1.1).

ACCEPTANCE CRITERIA

According to tested size / class valve, acceptance criteria are as follows:
In line leakage at high test pressure during burning period (§4.4.2.2): 400 ml/in/min
External leakage at high test pressure during burning and cooling down period (§4.4.2.2): 100 ml/in/min
The valve shall be capable to be moved to open position after burning period (§4.4.4.1)
In line leakage at low test pressure during 5 min test duration (§4.4.2.2): 40 ml/in/min
External leakage at low test pressure with valve in open position 5 min (§4.4.3.2): 20 ml/in/min
Pressure relief valve (15) shall not activate during the test.

TEST RESULTS

Burning time:		32 min
In line leakage during burning period :	total: 14080 ml	Average: 440 ml/min
Cooling time:		15 min
In line leakage during cooling time:	total: 11520 ml	Average: 360 ml/min
Total leakage during burning and cooling period:		25600 ml
External leakage during burning period:	total: 800 ml	Average: 25 ml/min
External leakage at high pressure in open position (5min)		Average: 18 ml/min

CONCLUSIONS

According to satisfactory test results, the valve meets requirements of:
API 6FA, 5th edition 2020
Qualified sizes and classes other than tested valve according to API 6FA table 4 and table 6 are as follows:

BREMER Valves s.r.l.

Trunnion side entry ball valve Dwg. R11-150150-FS Rev.0

Attached to test report 05/2021 dated 12/05/2021

Starting time: 14.35

Burning time Min	Thermocouple 1 °C	Thermocouple 2 °C	Calorimeter cube 1 °C	Calorimeter cube 2 °C	Pressure Bar
0	35	32	29	30	186
0,5	300	386	102	115	186
1	590	644	176	196	186
1,5	733	751	211	244	186
2	770	795	230	271	185
2,5	801	810	253	303	185
3	795	815	292	341	186
3,5	785	816	301	353	185
4	791	834	334	406	185
4,5	795	823	369	444	184
5	800	814	405	477	184
5,5	798	827	426	499	184
6	792	815	472	569	184
6,5	793	814	480	575	184
7	796	810	504	610	184
7,5	804	815	530	645	184
8	810	826	555	665	184
8,5	812	844	566	670	184
9	794	840	585	680	182
9,5	796	823	625	686	180
10	802	814	642	695	179
10,5	796	827	640	696	175
11	789	816	659	701	175
11,5	788	806	673	707	176
12	787	809	688	715	176
12,5	785	810	686	720	178
13	788	823	690	718	180
13,5	784	837	694	717	180
14	793	841	696	718	180
14,5	794	841	700	720	181
15	799	842	705	723	181
15,5	806	842	709	725	181
16	809	838	713	728	182
16,5	815	838	715	730	182
17	821	846	719	733	182
17,5	821	848	720	732	183
18	824	851	722	741	182
18,5	832	857	730	726	182
19	830	870	731	726	182
19,5	837	872	729	730	182
20	839	875	731	720	183
20,5	839	876	740	722	183
21	830	881	719	719	183
21,5	837	892	738	732	184
22	836	890	736	721	184
22,5	846	888	740	720	184
23	847	889	740	723	184

BREMER Valves s.r.l.

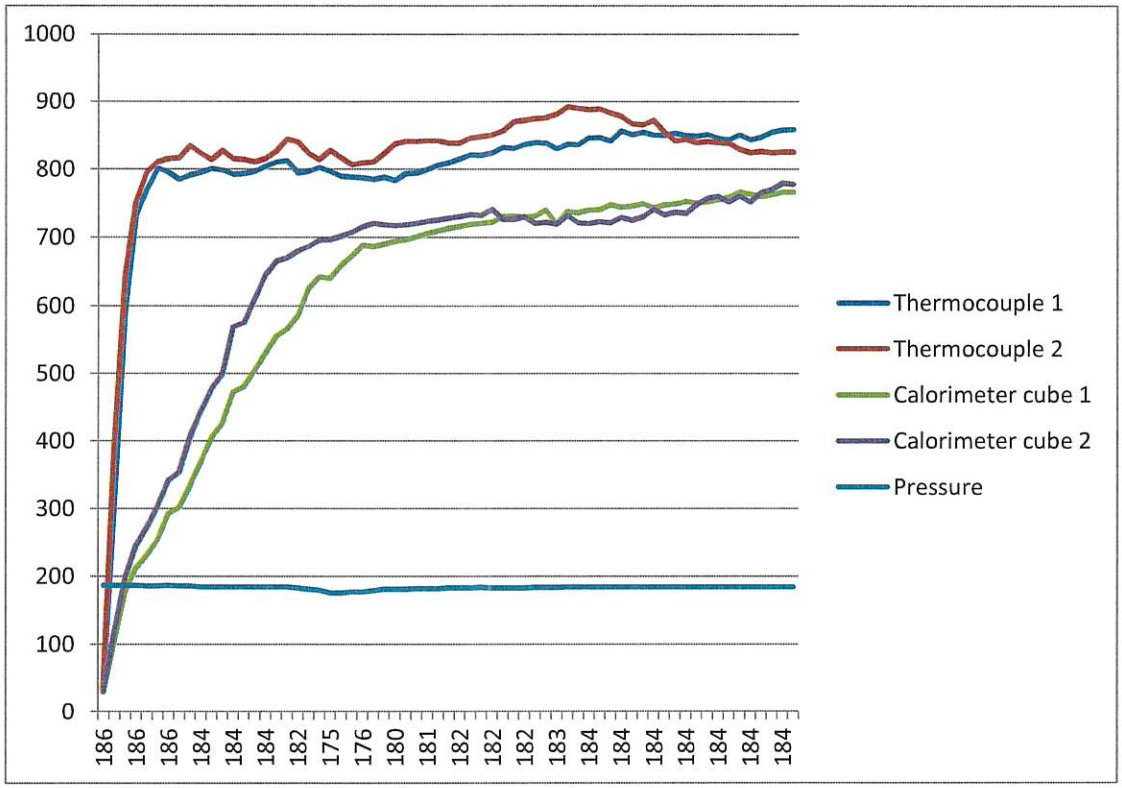
Trunnion side entry ball valve Dwg. R11-150150-FS Rev.0

Attached to test report 05/2021 dated 12/05/2021

Starting time: 14.35

Burning time Min	Thermocouple 1 °C	Thermocouple 2 °C	Calorimeter cube 1 °C	Calorimeter cube 2 °C	Pressure Bar
23,5	842	883	748	721	184
24	857	878	744	729	184
24,5	851	867	746	725	184
25	855	866	750	730	184
25,5	851	872	743	741	184
26	850	855	748	733	184
26,5	854	842	749	737	184
27	850	844	753	735	184
27,5	849	839	750	748	184
28	852	841	752	757	184
28,5	846	839	755	760	184
29	844	838	759	752	184
29,5	852	829	767	761	184
30	843	824	763	752	184
30,5	848	826	760	766	184
31	855	824	763	770	184
31,5	858	825	766	780	184
32	859	825	766	778	184
Average	820,8	840,3	740,5	737,9	
Min	770,0	795,0	705,0	719,0	

Note: Average and min. value are calculated after 2 min (thermocouples) and 15 min (calorimeters) from test start


1000
900
800
700
600
500
400
300
200
100
0
186
186
186
184
184
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182
175
176
180
181
182
182
182
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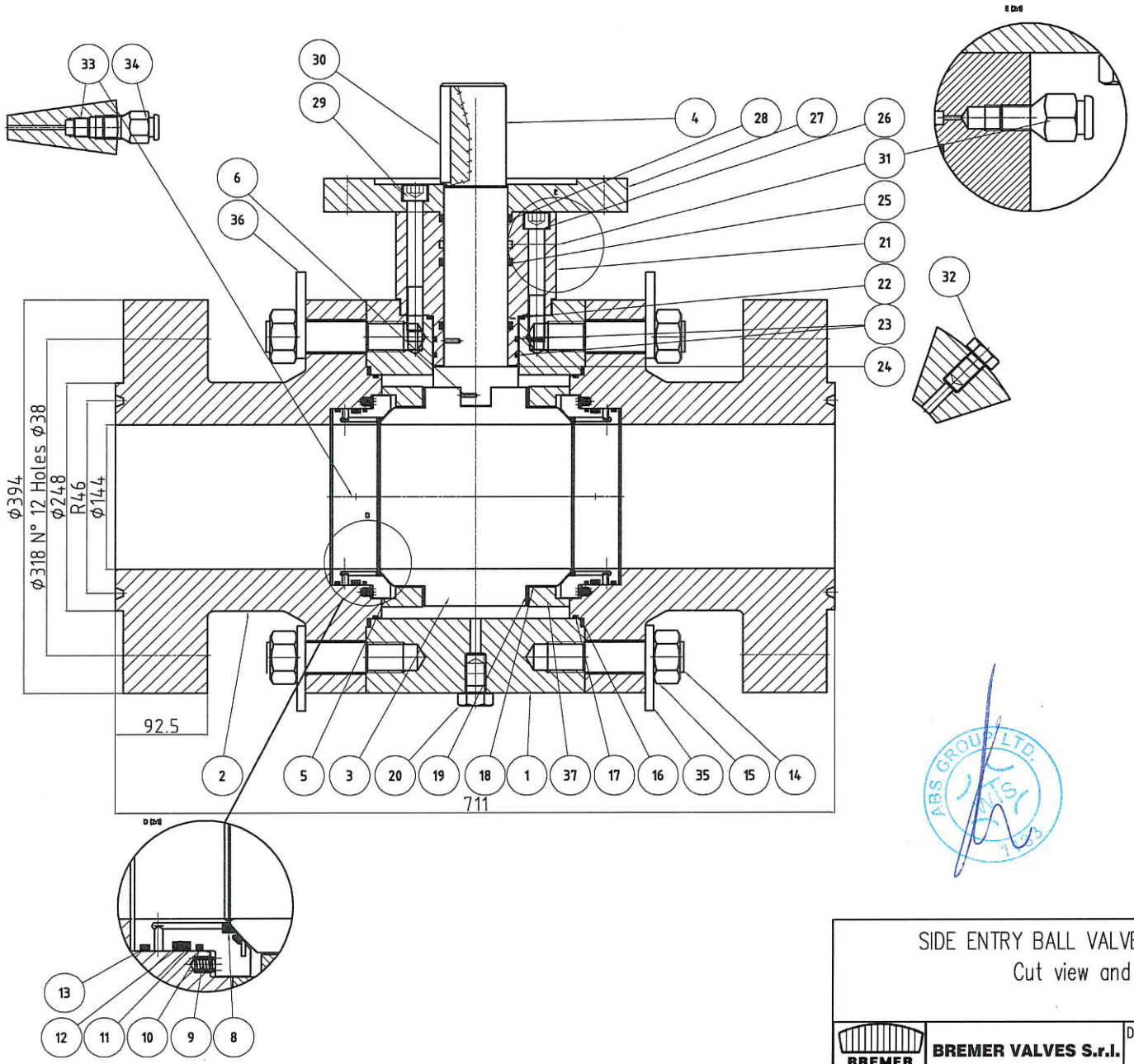
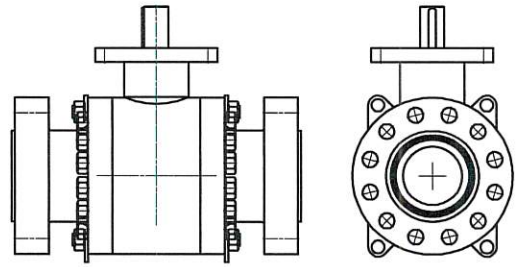
184
184
Thermocouple 1
Thermocouple 2
Calorimeter cube 1
Calorimeter cube 2
Pressure





1	Body	A350 LF2	1
2	Closure	A350 LF2	2
3	Ball	INC. 625	1
4	Stem	INC. 718	1
5	Seat	INC. 625	2
6	Antistatic spring	INC. 718	2
8	Seat insert	PEEK	2
9	Seat spring	INC. 718	32
10	Fire safe seat gasket	GRAPHITE	2
11	Backup ring	RPTFE	2
12	Primary seat gasket	Viton AED	2
13	Sealant gasket	Viton AED	2
14	Stud bolt	ASTM A193 B7M	24
15	Nut	ASTM A194 2HM	24
16	Body gasket	GRAPHITE	2
17	Body o-ring	Viton AED	2
18	Washer	RPTFE	2
19	Bearing	INC.625 + PTFE	2
20	Drain plug	INC. 625	1
21	Bonnet	A350 LF2	1
22	Bonnet gasket	GRAPHITE	1
23	Bonnet o-ring	Viton AED	2
24	Stem washer	PEEK	1
25	Stem O-ring	Viton AED	2
26	Bonnet screw	ASTM A193 B7M	6
27	Gear flange	A350 LF2	1
28	Fire safe stem gasket	Graphite	1
29	Gear flange screw	ASTM A193 B7M	6
30	Stem key	ASTM A108	1
31	Stem emergency sealant injector	INC. 625	1
32	Vent valve	INC. 625	1
33	Check valve	INC. 625	2
34	Seat emergency selant injector	INC. 625	2
35	Legs	ASTM A284 STEEL	4
36	Lifting lugs	ASTM A284 STEEL	2
37	Support plate	INC. 625	2

ABS GROUP LTD.

SIDE ENTRY BALL VALVE DN 6" #1500 RTJ
Cut view and part list

Scala:	Firma	Data
Disegnato	Merlini	28/02/2009
Approvato		
Sost. il Dis. :		
Sost. dal Dis.:		

Rev.	0	1	2	3	4	5	6	7	8	9	10
Data	28/02/2009										

BREMER

BREMER VALVES S.r.l.
23890 BARZAGO (LC)
VIA VIGNATE, 3/A

Disegno: R11-150150-FS

Full-filled PED Requirement

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