Fire Test Report

ANSI/API Standard 607, 5th Edition

Performed for

ValvTechnologies, Inc.

www.valv.com

2 inch Class 1500 Trunnion Ball Valve

Valve Code: H8C2-JJ-FP-B020-004AA-P02
Project Number: 213204
Test Date: April 3, 2014

Performed by

YARMOUTH RESEARCH AND TECHNOLOGY, LLC

434 Walnut Hill Road
North Yarmouth, ME 04097 USA
(207) 829-5359
info@yarmouthresearch.com
www.yarmouthresearch.com

Yarmouth Research and Technology, LLC

Customer:	ValvTechnologies, Inc.	**Date:**	4/3/2014
Specification:	ANSI/API Standard 607, Fifth Edition, 2010		
	ISO 10497: 2010		
Product Description:	2 inch Class 1500 Trunnion Ball Valve		
Product Code:	H8C2-JJ-FP-B020-004AA-P02		
Project Number:	PN213204		

Yarmouth Engineer:	Matthew J. Wasielewski, P.E.
Equipment Confirmed to be in Calibration to NIST Standards:	Yes

Burn and Cool Down Test

Burn Start Time:	9:14:00	
Average Pressure During Burn:	2761	psig
Seat Leak Rate During Burn:	0.0	ml/min
Allowable Seat Leak Rate:	800	ml/min
External Leak Rate During Burn/Cool Down:	0.0	ml/min
Allowable External Leak Rate:	200	ml/min
Amount of Time of Avg. Cal. Blocks > 650 deg. C:	21.0	minutes
Were Test Conditions Within Compliance?	Yes	
Were the Valve Leakages Below the Allowables?	Yes	

Operational Test

Average Pressure During Test:	2573	psig
External Leak Rate After Operating:	31	ml/min
Allowable External Leak Rate:	50	ml/min
Was the Leakage Below the Allowable?	Yes	
Does Valve Pass or Fail the Test Standard?	**PASS**	

Certified By

Matthew J. Wasielewski, PE
President and Manager, Yarmouth Research

STATE OF MAINE
MATTHEW
J
WASIELEWSKI
No. 7437
LICENSED
PROFESSIONAL ENGINEER

Fire Test Information Sheet

Valve Manufacturer's Name:	ValvTechnologies, Inc.
Valve Manufacturer's Address:	5904 Bingle Road Houston,Tx 77092
Did valve meet all required hydrostatic, leakage and other production pressure tests?	Yes
Valve Product Code:	H8C2-JJ-FP-B020-004AA-P02
Valve Description Size: Pressure Rating: Pressure Rating at 100F: Type: Weight: Reduced or Full Bore: Body/Bonnet Material: Trim Material: Seat Material: Stem / Body Seal Material: Body Bolting / Body Nut Material: Is valve considered "Soft-Seated"?	2" 1500# 1500# H-Series Metal Seated BV 1036 lbs. Full port A105 SA-29 Gr. 4130 SA-29 Gr. 4130 SA-29 Gr. 4130 / O-rings (EDR) + Graphite A193 Gr. B7 / A194 Gr. 2H No
Valve Markings Nameplate Information: Casting Markings:	NA
Assembly Drawing Number / Revision / Date of Issue:	131217-001
Assembly Drawing sent to Yarmouth:	Yes
If valve is fitted with gearbox, state gearbox manufacturer, model number and mechanical advantage:	Rotork IW3 – Rotork Gearbox w/ 12" H.W
If valve is non-symmetric, state direction of flow for test:	NA
For double-seated valves, state maximum allowable cavity pressure:	NA
Manufacturer's Contact Name /Date:	

DETAIL B

DETAIL C

DETAIL D

SECTION A-A

BILL OF MATERIALS		
ITEM	DESCRIPTION	QTY.
1	END CAP	2
2	BODY	1
3	BALL	1
4	THRUST WASHER	1
5	SEAT	2
6	BONNET	1
7	CROWN PLATE	1
8	STEM	1
9	KEY	2
10	STANDARD TRUNNION BEARING	2
11	STANDARD SLEEVE BEARING	2
12	SEAT PUSHER	2
13	BELLEVILLE SPRING	2
14	DOWEL PIN	4
15	BODY GASKET	2
16	O-RING (END CAP)	2
17	STEM PACKING	1
18	BONNET GASKET	1
19	O-RING (BONNET O.D.)	2
20	STEM BEARING	1
21	BONNET SEAL RING	1
22	O-RING (STEM O.D.)	2
23	O-RING (SEAT)	2
24	BACK UP RING (SEAT)	2
25	FLEX ROPE	2
26	BODY STUD	20
27	BODY NUT	20
28	DRAIN PLUG	1
29	BONNET CAP SCREW	4
30	CROWN PLATE CAP SCREW	4
31	MOUNTING BRACKET	1
32	DRIVE SLEEVE	1
33	CAP SCREW	4
34	LOCK WASHER	4
35	STUD	8
36	NUT	16
37	HANDWHEEL	1
38	EXEECO IW-3	1

REV.	DATE	DESCRIPTION	ECN	BY	APR

THIRD ANGLE PROJECTION

THIS DRAWING AND THE INFORMATION CONTAINED WITHIN IS CONSIDERED TO BE CONFIDENTIAL AND THE SOLE PROPERTY OF VALVTECHNOLOGIES. THE CONTENTS OF THIS DRAWING MAY NOT BE REPRODUCED OR DISCLOSED VERBALLY OR OTHERWISE OUTSIDE THE HOLDERS OFFICE WITHOUT THE WRITTEN APPROVAL OF VALVTECHNOLOGIES.

DIMENSIONS ARE IN: INCHES [MILLIMETERS]

OVERALL DIMENSIONS: 26 x 19 x 15

FOR SALES ORDER

ACTUATOR ORIENTATION IS FOR ILLUSTRATION PURPOSES ONLY. ACCESSORIES MAY NOT BE INCLUDED IN DRAWING.

MODEL FILE: 131217-001

SCALE	WEIGHT	SHEET	SIZE
1:4	298 LBS	1 OF 2	B

DRAWN BY	DATE
MS	8/27/13
ENGINEER	DATE
PH	8/29/13

VALVTECHNOLOGIES

5904 BINGLE ROAD, HOUSTON TEXAS 77092
WWW.VALV.COM

TITLE: 2" 1500#, RTJ FLANGE, 1.654" BORE, TRUNTECH 3-PIECE TRUNNION

131217-001

REV. 0

Temperature verses Time Chart
1000
900
800
700
600
500
400
300
200
100
0
Temperature - C
Average Cal. Block
Average Flame
00:00
02:30
05:00
07:30
10:00
12:30
15:00
17:30
20:00
22:30
25:00
27:30
30:00
32:30
35:00
37:30
40:00
Test Time - min:sec

Pressure verses Time Chart
3500
3000
2500
2000
1500
1000
500
0
Test Pressure-psig
00:00
05:00
10:00
15:00
20:00
25:00
30:00
35:00
40:00
Test Time - min:sec

Valve Label

Test Setup Prior to Burn

Test Valve During Burn

Test Valve Post-Burn

Yarmouth Research and Technology, LLC

Fire Test Information

Customer: ValvTechnologies, Inc. **Date:** 4/3/2014

Product Code: 2 inch Class 1500 Trunnion Ball Valve

Project Number: PN213204

Fire Test Raw Data

Time	Pressure (psig)	Water Volume (mls)	Cal. Block 1 Temp-C	Cal. Block 2 Temp-C	Avg. Cal Block Temp-C	Bonnet Flame Temp-C	Body Flame Temp-C	Average Flame Temp-C
9:14:00	2700	31539	32	32	32	87	27	57
9:14:15	2701	31583	33	34	33	376	85	230
9:14:30	2702	31557	39	54	47	753	265	509
9:14:45	2706	31590	55	98	76	832	486	659
9:15:00	2707	31588	74	125	100	878	637	757
9:15:15	2710	31587	96	152	124	915	718	817
9:15:30	2713	31564	114	191	153	880	792	836
9:15:45	2716	31589	129	231	180	904	809	856
9:16:00	2723	31566	156	267	212	918	826	872
9:16:15	2732	31566	182	301	241	927	817	872
9:16:30	2744	31563	207	330	268	933	804	869
9:16:45	2760	31579	230	358	294	932	818	875
9:17:00	2779	31574	252	383	317	933	831	882
9:17:15	2801	31583	272	407	339	937	834	886
9:17:30	2827	31604	290	428	359	935	843	889
9:17:45	2854	31587	307	449	378	939	837	888
9:18:00	2863	31562	322	468	395	938	842	890
9:18:15	2877	31556	337	487	412	934	851	893
9:18:30	2893	31566	351	503	427	939	853	896
9:18:45	2906	31553	363	518	441	946	852	899
9:19:00	2673	31612	374	533	453	932	851	892
9:19:15	2713	31614	385	546	466	971	849	910
9:19:30	2760	31573	401	559	480	1018	860	939
9:19:45	2809	31603	420	571	495	1024	859	942
9:20:00	2853	31578	440	582	511	1021	830	926
9:20:15	2866	31615	461	592	526	1026	861	944
9:20:30	2887	31613	479	602	541	1019	863	941
9:20:45	2907	31600	496	611	554	976	854	915
9:21:00	2931	31599	514	619	567	976	866	921
9:21:15	2592	31599	534	627	581	960	873	917
9:21:30	2671	31598	553	634	593	954	873	914
9:21:45	2690	31613	571	641	606	978	871	924
9:22:00	2707	31582	586	647	617	951	876	913

Fire Test Data - continued

9:22:15	2742	31616	600	653	627	969	862	916
9:22:30	2793	31594	613	659	636	983	871	927
9:22:45	2845	31616	624	664	644	973	877	925
9:23:00	2906	31599	636	669	652	953	877	915
9:23:15	2978	31611	648	673	661	940	877	908
9:23:30	3052	31596	656	677	666	934	880	907
9:23:45	2618	31594	664	681	673	948	878	913
9:24:00	2643	31569	672	685	679	991	885	938
9:24:15	2653	31556	679	689	684	966	879	923
9:24:30	2665	31570	687	692	689	957	879	918
9:24:45	2670	31565	693	696	694	941	881	911
9:25:00	2673	31579	699	698	699	976	888	932
9:25:15	2675	31574	704	701	703	940	886	913
9:25:30	2678	31579	709	704	706	981	891	936
9:25:45	2682	31603	713	707	710	962	886	924
9:26:00	2687	31558	717	709	713	973	888	931
9:26:15	2689	31575	722	712	717	968	890	929
9:26:30	2694	31552	726	713	719	992	893	943
9:26:45	2703	31587	729	716	722	956	894	925
9:27:00	2717	31579	732	718	725	951	887	919
9:27:15	2732	31570	736	719	728	930	897	914
9:27:30	2748	31600	738	721	729	943	896	919
9:27:45	2763	31554	739	723	731	941	899	920
9:28:00	2778	31611	741	724	733	932	897	914
9:28:15	2794	31605	743	726	734	936	898	917
9:28:30	2812	31570	744	728	736	957	898	928
9:28:45	2824	31568	745	729	737	969	902	936
9:29:00	2834	31610	747	731	739	936	904	920
9:29:15	2840	31600	748	732	740	957	904	931
9:29:30	2847	31576	748	733	741	937	897	917
9:29:45	2851	31569	749	734	742	939	900	920
9:30:00	2856	31585	750	736	743	947	898	923
9:30:15	2862	31583	751	737	744	937	901	919
9:30:30	2868	31605	751	738	744	943	901	922
9:30:45	2872	31573	752	739	745	923	897	910
9:31:00	2878	31596	752	739	746	949	905	927
9:31:15	2876	31596	753	741	747	938	907	923
9:31:30	2882	31598	753	741	747	937	901	919
9:31:45	2886	31561	753	742	748	942	906	924
9:32:00	2887	31575	754	743	748	932	904	918
9:32:15	2896	31605	754	743	749	932	902	917
9:32:30	2899	31623	754	744	749	927	909	918
9:32:45	2901	31571	754	744	749	932	906	919

Fire Test Data - continued

9:33:00	2906	31561	754	745	749	923	908	915
9:33:15	2910	31559	754	746	750	919	905	912
9:33:30	2911	31620	755	747	751	942	908	925
9:33:45	2916	31608	756	747	751	922	909	916
9:34:00	2918	31613	756	748	752	966	903	935
9:34:15	2918	31617	756	748	752	939	908	924
9:34:30	2917	31616	756	748	752	943	907	925
9:34:45	2917	31621	756	749	753	940	907	923
9:35:00	2914	31597	756	749	753	960	909	934
9:35:15	2912	31562	756	750	753	953	908	930
9:35:30	2677	31553	756	751	753	921	907	914
9:35:45	2667	31578	755	751	753	926	912	919
9:36:00	2683	31605	755	752	753	911	913	912
9:36:15	2714	31583	754	752	753	924	915	920
9:36:30	2761	31610	754	752	753	928	913	921
9:36:45	2795	31606	754	752	753	923	911	917
9:37:00	2814	31605	753	753	753	914	904	909
9:37:15	2837	31560	753	753	753	973	920	946
9:37:30	2864	31589	752	753	752	939	908	923
9:37:45	2888	31557	751	753	752	933	912	923
9:38:00	2909	31577	751	753	752	933	912	923
9:38:15	2694	31572	751	754	752	952	914	933
9:38:30	2676	31614	751	755	753	921	907	914
9:38:45	2673	31581	749	755	752	923	906	914
9:39:00	2696	31595	748	756	752	953	912	933
9:39:15	2737	31584	748	756	752	923	911	917
9:39:30	2783	31556	747	757	752	910	918	914
9:39:45	2808	31602	747	757	752	926	919	923
9:40:00	2829	31611	746	757	751	939	921	930
9:40:15	2847	31608	745	757	751	902	911	906
9:40:30	2867	31598	744	757	751	913	917	915
9:40:45	2891	31573	742	757	750	898	912	905
9:41:00	2919	31613	742	757	749	908	913	911
9:41:15	2629	31608	741	758	749	912	908	910
9:41:30	2677	31619	739	758	749	881	903	892
9:41:45	2757	31591	738	759	748	934	908	921
9:42:00	2838	31599	737	759	748	966	909	938
9:42:15	2920	31611	737	760	748	944	914	929
9:42:30	2651	31582	737	760	749	927	911	919
9:42:45	2734	31605	737	761	749	908	912	910
9:43:00	2815	31584	737	761	749	916	913	914
9:43:15	2897	31608	738	761	750	905	913	909
9:43:30	2626	31558	736	761	749	909	914	912

Fire Test Data - continued

9:43:45	2695	31563	736	761	749	892	913	903
9:44:00	2617	31606	736	761	748	902	917	909
9:44:15	2709	31592	734	761	747	674	670	672
9:44:30	2775	31588	727	753	740	479	499	489
9:44:45	2535	31588	706	728	717	186	193	189
9:45:00	2593	31564	606	577	591	61	75	68
9:45:15	2596	31565	461	361	411	40	46	43
9:45:30	2611	31568	339	223	281	31	35	33
9:45:45	2610	31539	254	147	201	24	29	27
9:46:00	2604	31542	197	104	150	24	28	26
9:46:15	2612	31547	156	79	117	23	26	25
9:46:30	2622	31535	126	64	95	21	24	23
9:46:45	2614	31514	103	56	79	19	23	21
9:47:00	2618	31516	87	49	68	18	23	21
9:47:15	2616	31512	74	46	60	18	22	20
9:47:30	2618	31515	65	43	54	18	21	19
9:47:45	2622	31508	58	42	50	17	21	19
9:48:00	2623	31520	53	40	46	17	20	18
9:48:15	2627	31506	48	39	44	16	20	18
9:48:30	2630	31504	45	38	41	16	19	17
9:48:45	2620	31471	42	37	40	16	18	17
9:49:00	2621	31480	40	37	38	16	18	17
9:49:15	2623	31482	38	36	37	15	18	16
9:49:30	2624	31488	37	36	36	15	18	16
9:49:45	2624	31478	36	35	35	14	17	16
9:50:00	2625	31480	35	35	35	14	17	15
9:50:15	2627	31480	34	34	34	14	16	15
9:50:30	2629	31477	33	34	34	14	16	15
9:50:45	2631	31471	33	33	33	13	16	14
9:51:00	2632	31488	32	33	33	13	16	14
9:51:15	2634	31468	32	33	32	13	15	14
9:51:30	2637	31478	32	32	32	13	14	14
9:51:45	2637	31470	31	32	32	13	14	14
9:52:00	2639	31483	31	32	31	13	14	14
9:52:15	2641	31471	31	32	31	12	14	13
9:52:30	2641	31475	30	31	31	12	14	13
9:52:45	2641	31474	30	31	31	12	13	13
9:53:00	2605	31450	30	31	30	12	14	13
9:53:15	2627	31443	29	31	30	12	13	13
9:53:30	2633	31444	29	31	30	12	13	13
9:53:45	2635	31449	29	30	30	12	13	13
9:54:00	2638	31444	29	30	30	12	13	12

Leakage Summary for Burn and Cool Down Periods

All pressure transducers and thermocouples are in calibration per YRT's QA program.
Seat leakages were collected manually. External leakage was collected electronically.

Total Through Seat Leakage Collected Over 30 Minute Duration:	0.0	mls
Average Leak Rate Over 30 Minute Duration:	0.0	ml/min
Allowable Leak Rate:	800	ml/min

Total Through Seat Leakage Collected Over 10 Minute Cool Down:	0.0	mls

Total Water Volume Lost Over 40 Minute Burn and Cool Down:	95	mls
Water Collected in System Relief Valve:	95	mls
Calculated External Leakage During 40 Minute Duration:	0.0	mls
Average Leak Rate Over 40 Minute Duration:	0.0	ml/min
Allowable Leak Rate:	200	ml/min

Were the Valve Leakages Below the Allowables?	**Yes**

Yarmouth Research and Technology, LLC

Summary of Test Parameters During Burn and Cool Down Periods

Amount of Time Pressure Dropped Below 50%:	0.0	minutes
Maximum Allowable Low Pressure Time:	2.0	minutes
Maximum Pressure During Burn/Cool Down:	3052	psig
Average Pressure During Burn/Cool Down:	2750	psig
Minimum Pressure During Burn/Cool Down:	2535	psig
Amount of Time of Avg. Cal Block > 650 deg.C:	21.0	minutes
Minimum Allowable Time at Temperature:	15.0	minutes
Maximum Avg Cal Block Temperature:	753	deg. C
Average Cal Block Temperature:	507	deg. C
Lowest Avg Cal. Block Temperature:	29.7	deg. C
Maximum Body Flame Temperature During Burn:	921	deg. C
Average Body Flame Temperature During Burn:	865	deg. C
Maximum Bonnet Flame Temperature During Burn:	1026	deg. C
Average Bonnet Flame Temperature During Burn:	928	deg. C
Average of Both Flame Temperatures During Burn:	897	deg. C

Notes

Were Test Conditions Within Compliance?	**Yes**

Post-Burn Seat Test Information

Customer:	ValvTechnologies, Inc.	**Date:**	4/3/2014
Product Code:	2 inch Class 1500 Trunnion Ball Valve		
Project Number:	PN213204		

This test not necessary for this pressure class.

Yarmouth Research and Technology, LLC

Operational Test Information

Customer: ValvTechnologies, Inc. **Date:** 4/3/2014

Product Code: 2 inch Class 1500 Trunnion Ball Valve

Project Number: PN213204

Test Data

Time	Pressure (psig)	Cal Block Temp - C
9:59:25	2574	31
9:59:40	2575	31
9:59:55	2572	31
10:00:10	2571	31
10:00:25	2524	32
10:00:40	2575	32
10:00:55	2576	32
10:01:10	2575	32
10:01:25	2574	32
10:01:40	2576	32
10:01:55	2575	32
10:02:10	2561	32
10:02:25	2578	32
10:02:40	2575	32
10:02:55	2578	32
10:03:10	2578	32
10:03:25	2581	32
10:03:40	2579	32
10:03:55	2580	32
10:04:10	2577	32
10:04:25	2583	32

Leakages were collected manually.

Total External Leakage Collected Over 5 Minute Duration:	155	mls
Average Leak Rate Over 5 Minute Duration:	31	ml/min
Allowable Leak Rate:	50	ml/min

Was the Valve Leakage Below the Allowable?	**Yes**