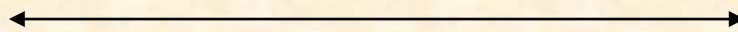


Fire Test Report
ANSI/API Standard 607
Fourth Edition, May 1993

Performed for

ValvTechnologies, Inc.

www.valv.com



2 Inch Class 300 Metal-Seated Ball Valve
Product Code: V528-RF-FP-B020-001DT-001

Project Number: 211088
December 15, 2011

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

Customer: ValvTechnologies, Inc.

Date: 12/15/2011

Specification: API 607, Fourth Edition, May 1993

Product Description: 2 inch Class 300 Metal-seated Ball Valve

Project Number: PN211088

Comments: V528-RF-FP-B020-001DT-001

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:	10:46:00	
Average Pressure During Burn:	31	psig
Seat Leak Rate During Burn:	0	ml/min
Allowable Seat Leak Rate:	200	ml/min
External Leak Rate During Burn/Cool Down:	1	ml/min
Allowable External Leak Rate:	50	ml/min
Were the Valve Leakages Below the Allowables?	Yes	

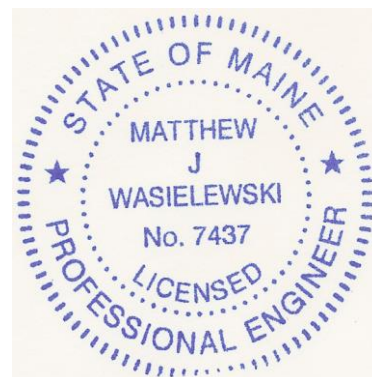
Operational Test

Average Pressure During Test:	555	psig
Seat Leak Rate After Operating:	14	ml/min
Allowable Seat Leak Rate:	40	ml/min
External Leak Rate After Operating:	4	ml/min
Allowable External Leak Rate:	50	ml/min
Were the Valve Leakages Below the Allowables?	Yes	

Valve Pass or Fail the Test Standard?	PASS
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Witnesses

Matthew J. Wasielewski

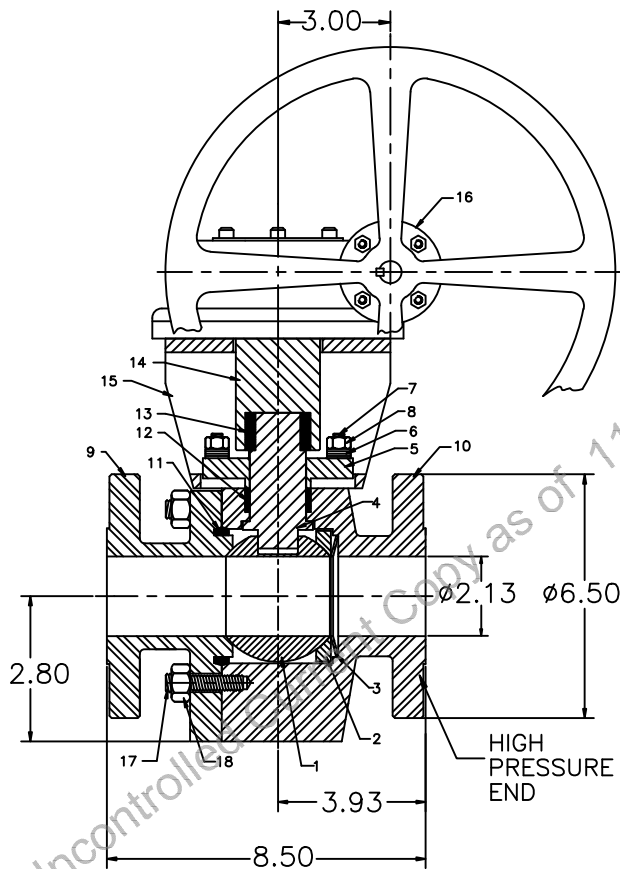
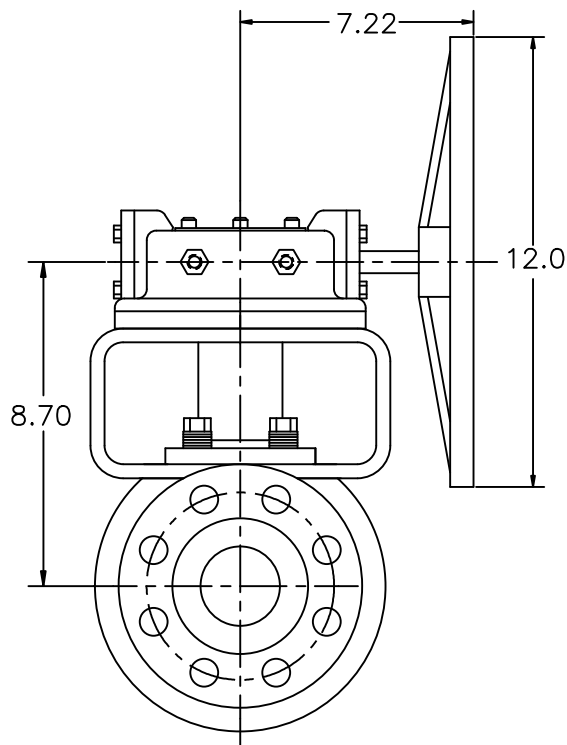


YARMOUTH RESEARCH AND TECHNOLOGY, LLC

Fire Test Information Sheet

Valve Manufacturer's Name:	ValvTechnologies
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:	V528-RF-FP-B020-001DT-001
Valve Description	Size: 2" Pressure Rating: 300# Pressure Rating at 100F: 720 psig Type: Seat-Supported Ball Valve Weight: 58 Lbs. Reduced or Full Bore: Full Bore Body/Bonnet Material: SA-182 316H Trim Material: SA-182 316H Seat Material: SA-182 316H w/ RAM 31 coat Stem / Body Seal Material: 316H/A286 Bolting Material: SA-453 660 Is valve considered "Soft-Seated"? No
Valve Markings	Nameplate Information: Size, Pressure Class Casting Markings: N/A
Assembly Drawing Number / Revision / Date of Issue:	111034-4 / Rev. 1 / 11/07/11
Assembly Drawing sent to Yarmouth:	Yes
If valve is fitted with gearbox, state gearbox manufacturer, model number and mechanical advantage:	N/A
If valve is non-symmetric, state direction of flow for test:	Flow to enter High Pressure End as indicated by tag on valve
For double-seated valves, state maximum allowable cavity pressure:	N/A
Manufacturer's Contact Name /Date:	Becky Kowen/ 11/10/11

Customer: VTI
Project Name: FIRE SAFE



BILL OF MATERIAL			
ITEM	DESCRIPTION	MATERIAL	QTY.
1	BALL	SA-182-F316H/RAM21	1*
2	UPSTREAM SEAT	SA-182-F316H/QPQ	1*
3	BELLEVILLE SPRING	Inc 718	1*
4	STEM	SA-182-F36H/QPQ	1
5	GLAND	316 S.S./QPQ	1
6	GLAND LOAD SPRING	INC 718	24
7	GLAND STUD	A193 Gr. B8M	4
8	GLAND NUT	A194 Gr. 8M	4
9	END CAP	SA-182-F36H/RAM21	1*
10	BODY	SA-182-F36H	1
11	BODY GASKET	A286/PT24	1*
12	GLAND PACKING	316 S.S./GRAFOIL	1*
13	KEY	1018	2
14	DRIVE SLEEVE	4130	1
15	MOUNTING BRACKET	A500	1
16	ACTUATOR	EXEECO IW-3/40	1
17	BODY STUD	SA-453 660	4
18	BODY NUT	SA-453 660	4

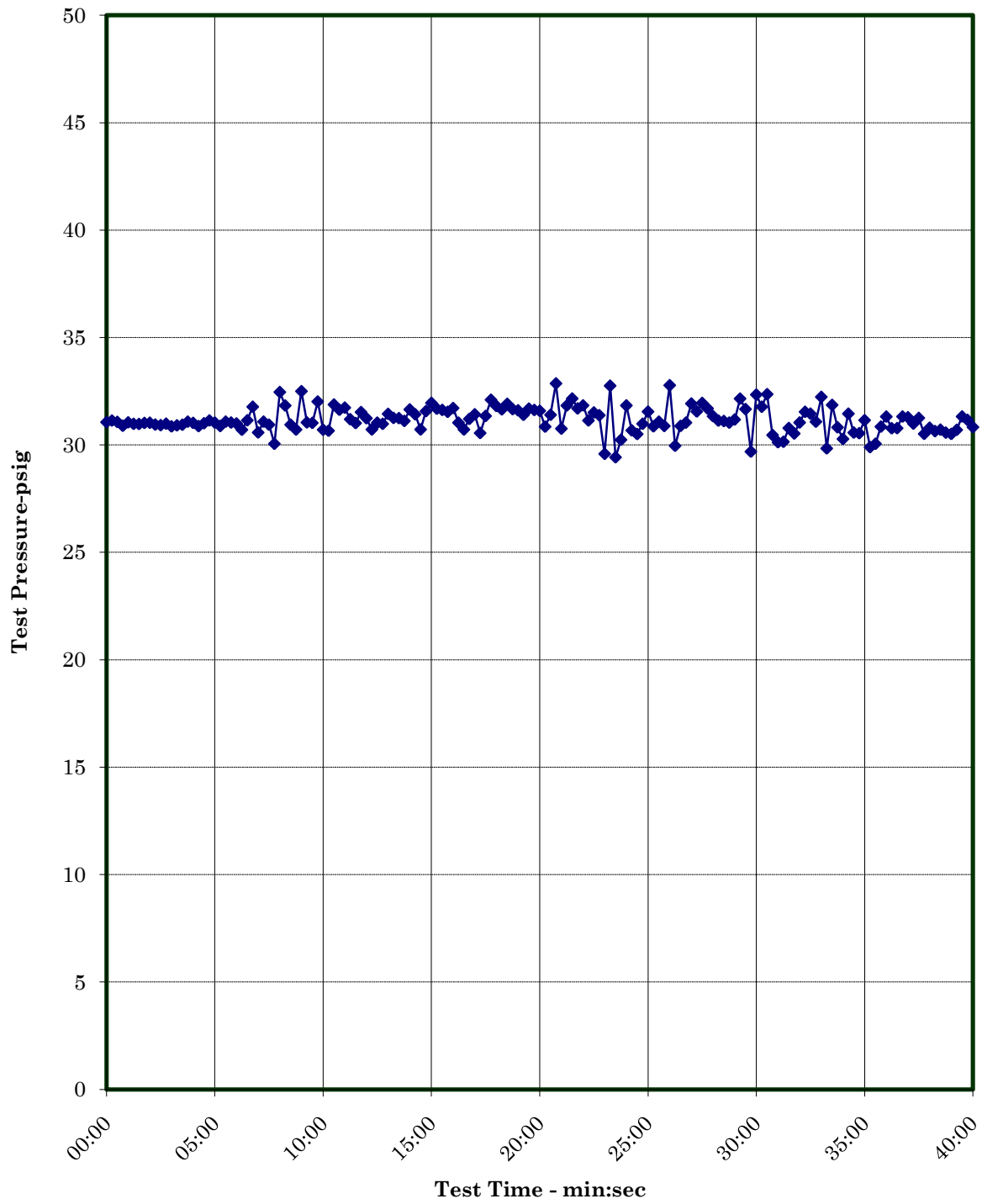
* Recommended Spare Parts

** Release For Customer Approval

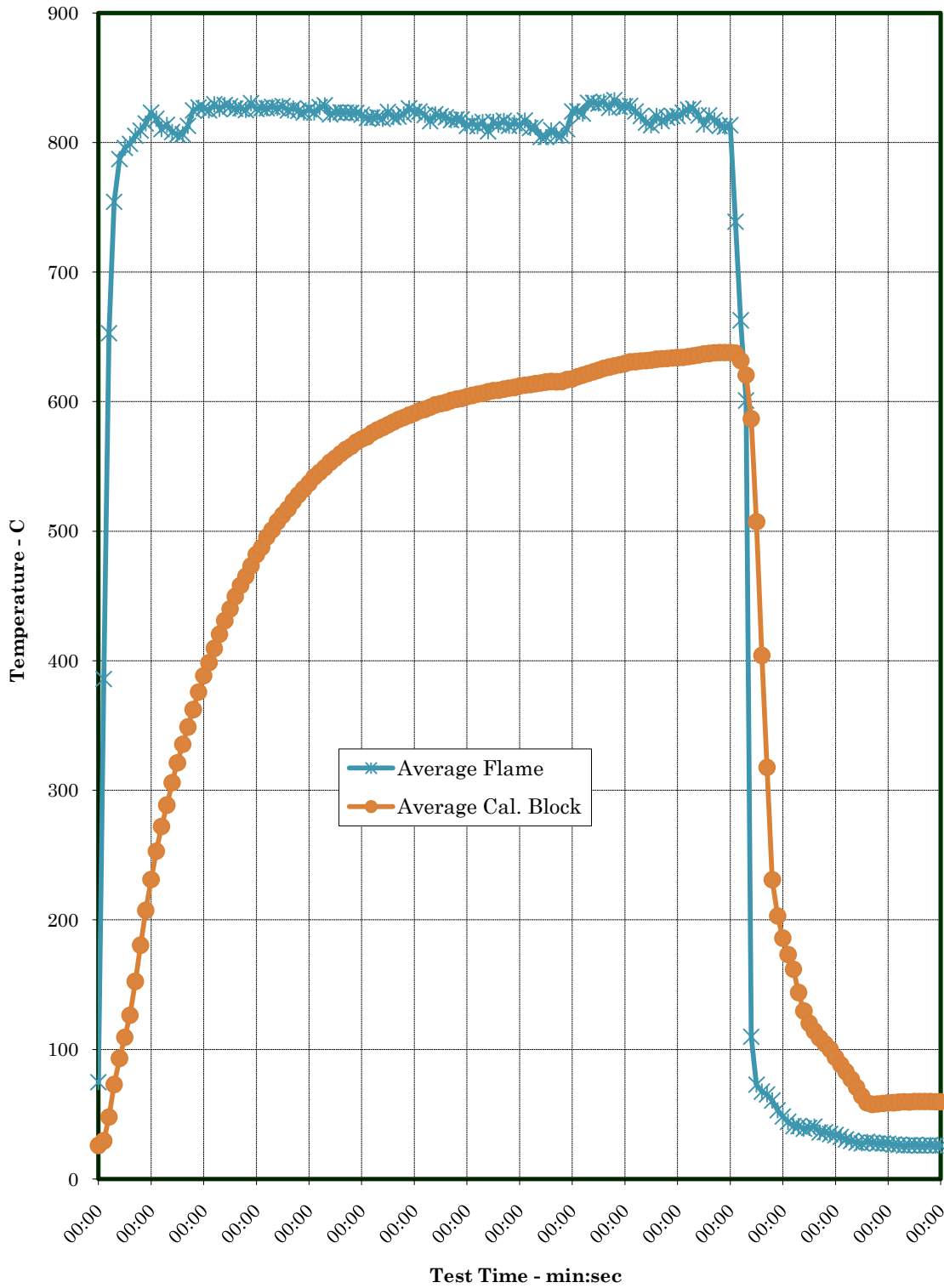
Approx. Valve Weight: 35 lbs
Approx. Actuator Weight: 23 lbs
Approx. Total Weight: 58 lbs

 THIRD ANGLE PROJECTION						DIMENSIONS ARE IN INCHES REMOVE BURRS AND BREAK EDGES UNLESS OTHERWISE SPECIFIED		SCALE: - MODEL FILE: - SIZE: B	VALVETECHNOLOGIES 5904 BINGLE ROAD, HOUSTON TEXAS 77062 PH: (713) 860-0400 FAX: (713) 860-0499
THIS DRAWING AND THE INFORMATION CONTAINED WITHIN IS CONSIDERED TO BE CONFIDENTIAL AND THE SOLE PROPERTY OF VALVETECHNOLOGIES. THE CONTENTS OF THIS DRAWING MAY NOT BE REPRODUCED OR DISCLOSED VERBALLY OR OTHERWISE OUTSIDE THE HOLDERS OFFICE WITHOUT THE WRITTEN APPROVAL OF VALVETECHNOLOGIES.						CORNER RADII - .X= ± .XX= ± .XXX= ± CONCENTRICITY ANGULAR= ± SURFACE TEXTURE - MIN. INTERNAL FILLETS -		COATING: - MATERIAL: - DRAWN BY: SC DATE: 07/14/11 CHECKED BY: RSL DATE: 07/15/11 ENGINEER: DS DATE: 11/07/11 APPROVED BY: DS DATE: 11/07/11	
REV	DATE	DESCRIPTION	ECN	BY	CHK	APR			111034-4 SH 1 OF 1

Pressure verses Time Chart



Temperature verses Time Chart



Yarmouth Research and Technology, LLC



Test Valve During Burn

Yarmouth Research and Technology, LLC



Test Valve During Burn

Yarmouth Research and Technology

Fire Test Information

Customer: ValvTechnologies, Inc.

Date: 12/15/2011

Product Code: 2 inch Class 300 Metal-seated Ball Valve

Project Number: PN211088

Fire Test Raw Data

Time	Pressure (psig)	Water Volume (mls)	Bonnet Temp-C	Body Temp-C	Bonnet Flame Temp-C	Body Flame Temp-C	Average Flame Temp-C
10:46:00	31	33386	33	21	109	40	75
10:46:15	31	33357	40	24	524	247	386
10:46:30	31	33390	69	42	781	524	653
10:46:45	31	33380	103	66	854	654	754
10:47:00	31	33362	113	91	871	703	787
10:47:15	31	33342	133	103	882	710	796
10:47:30	31	33376	162	107	882	716	799
10:47:45	31	33363	194	136	880	731	805
10:48:00	31	33371	225	169	871	748	809
10:48:15	31	33358	256	199	872	758	815
10:48:30	31	33358	287	226	867	779	823
10:48:45	31	33386	311	247	868	769	818
10:49:00	31	33362	332	267	862	759	810
10:49:15	31	33343	352	286	860	767	814
10:49:30	31	33341	372	303	854	762	808
10:49:45	31	33377	389	321	844	768	806
10:50:00	31	33375	406	336	841	772	806
10:50:15	31	33388	422	353	837	788	813
10:50:30	31	33374	436	369	836	813	825
10:50:45	31	33375	449	386	834	819	827
10:51:00	31	33406	461	402	833	819	826
10:51:15	31	33398	473	417	831	818	825
10:51:30	31	33405	483	431	831	828	829
10:51:45	31	33378	493	444	833	818	826
10:52:00	31	33381	503	456	832	826	829
10:52:15	31	33308	512	468	832	823	828
10:52:30	31	33397	521	478	833	819	826
10:52:45	32	33663	529	488	832	821	826
10:53:00	31	33295	537	496	831	819	825
10:53:15	31	33306	544	508	831	829	830
10:53:30	31	34360	552	515	826	826	826
10:53:45	30	33401	558	523	827	826	827
10:54:00	32	34877	564	531	825	828	826

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Fire Test Data - continued

10:54:15	32	35352	570	538	826	829	828
10:54:30	31	33815	576	545	826	828	827
10:54:45	31	33363	582	551	826	831	828
10:55:00	33	35252	587	557	823	826	825
10:55:15	31	33842	592	563	822	831	826
10:55:30	31	33986	596	568	822	827	824
10:55:45	32	34706	600	573	823	823	823
10:56:00	31	34026	604	578	821	830	826
10:56:15	31	33395	608	581	820	826	823
10:56:30	32	34299	613	585	820	834	827
10:56:45	32	34575	616	589	819	838	829
10:57:00	32	34511	620	593	817	827	822
10:57:15	31	33767	623	596	817	830	823
10:57:30	31	33775	626	599	816	831	823
10:57:45	32	34475	629	602	816	831	823
10:58:00	31	33788	632	603	816	830	823
10:58:15	31	33688	635	607	814	831	823
10:58:30	31	33975	638	608	813	830	821
10:58:45	31	34081	640	609	812	826	819
10:59:00	31	34388	642	612	813	826	819
10:59:15	31	34068	644	615	811	828	819
10:59:30	31	34086	646	616	812	825	818
10:59:45	31	34168	648	617	809	838	824
11:00:00	32	33928	650	620	809	829	819
11:00:15	31	32800	652	622	810	830	820
11:00:30	31	33800	653	623	810	833	822
11:00:45	32	33726	655	625	809	843	826
11:01:00	32	34597	657	626	808	839	824
11:01:15	32	34621	658	628	807	841	824
11:01:30	32	34518	659	629	807	835	821
11:01:45	32	34535	661	631	806	827	816
11:02:00	32	33955	662	633	805	838	822
11:02:15	31	33440	663	633	804	836	820
11:02:30	31	33542	664	632	804	835	819
11:02:45	31	34054	666	635	803	832	817
11:03:00	31	34067	667	635	803	832	818
11:03:15	31	33732	668	634	803	833	818
11:03:30	31	33469	669	636	803	823	813
11:03:45	32	34565	670	636	802	828	815
11:04:00	32	34594	672	637	802	823	813
11:04:15	32	34538	672	637	800	832	816
11:04:30	32	34576	673	638	799	818	809
11:04:45	32	33657	674	639	801	831	816

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Fire Test Data - continued

11:05:00	32	34352	675	638	801	827	814
11:05:15	31	33521	676	639	799	834	817
11:05:30	32	34338	677	639	798	827	813
11:05:45	32	34155	677	639	798	832	815
11:06:00	32	34081	678	640	798	828	813
11:06:15	31	33901	679	641	797	837	817
11:06:30	31	34080	680	641	798	824	811
11:06:45	33	34344	681	641	798	826	812
11:07:00	31	33696	681	641	797	812	804
11:07:15	32	33453	682	641	799	809	804
11:07:30	32	34442	683	641	798	821	809
11:07:45	32	33652	683	640	798	813	806
11:08:00	32	33654	684	640	798	812	805
11:08:15	31	34008	685	641	797	824	810
11:08:30	32	34075	686	641	799	849	824
11:08:45	31	34066	686	643	800	848	824
11:09:00	30	32976	687	644	800	844	822
11:09:15	33	35395	687	645	800	861	831
11:09:30	29	33937	688	646	800	861	831
11:09:45	30	33513	688	647	801	859	830
11:10:00	32	34762	689	648	801	862	831
11:10:15	31	34342	689	649	801	853	827
11:10:30	31	33341	689	650	800	866	833
11:10:45	31	33625	690	650	800	855	828
11:11:00	32	34507	691	650	799	856	828
11:11:15	31	34045	691	652	800	857	828
11:11:30	31	34055	692	651	800	848	824
11:11:45	31	33713	692	653	799	842	820
11:12:00	33	34321	692	651	799	832	815
11:12:15	30	34481	692	651	801	826	813
11:12:30	31	34751	693	651	801	841	821
11:12:45	31	34639	693	651	800	833	816
11:13:00	32	34863	694	651	806	833	819
11:13:15	32	33694	694	651	808	833	820
11:13:30	32	34755	695	650	807	834	820
11:13:45	32	34690	695	650	807	839	823
11:14:00	31	34485	696	650	807	844	825
11:14:15	31	34179	696	650	805	847	826
11:14:30	31	34002	697	651	806	836	821
11:14:45	31	34080	697	651	805	823	814
11:15:00	31	34063	697	651	806	836	821
11:15:15	32	35087	698	652	806	828	817
11:15:30	32	35516	698	652	806	819	813

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Fire Test Data - continued

11:15:45	30	33187	699	651	807	817	812
11:16:00	32	34084	699	651	807	820	813
11:16:15	32	33243	699	650	804	673	739
11:16:30	32	35195	696	644	806	519	663
11:16:45	30	33464	686	633	772	430	601
11:17:00	30	32967	629	602	148	72	110
11:17:15	30	33057	488	520	68	77	73
11:17:30	31	35323	351	363	69	66	68
11:17:45	31	33863	233	235	69	62	65
11:18:00	31	33805	148	76	63	58	61
11:18:15	32	33467	100	57	52	54	53
11:18:30	31	33914	75	48	45	52	48
11:18:45	31	33256	59	43	42	46	44
11:19:00	32	34981	50	40	39	43	41
11:19:15	30	32248	43	38	38	43	41
11:19:30	32	34395	39	36	37	41	39
11:19:45	31	33341	37	34	39	40	39
11:20:00	30	33261	34	34	43	38	41
11:20:15	31	33887	33	33	34	38	36
11:20:30	31	33567	31	32	33	39	36
11:20:45	31	33747	30	32	31	39	35
11:21:00	31	33488	29	30	30	38	34
11:21:15	30	32839	28	29	29	36	33
11:21:30	30	33032	27	28	27	34	31
11:21:45	31	33062	27	27	26	33	29
11:22:00	31	33927	26	26	26	30	28
11:22:15	31	33295	25	26	26	29	28
11:22:30	31	33717	25	26	29	28	29
11:22:45	31	33794	25	26	29	27	28
11:23:00	31	33837	26	26	29	26	28
11:23:15	31	33855	26	26	29	26	28
11:23:30	31	33797	26	27	29	25	27
11:23:45	31	33272	26	27	29	24	27
11:24:00	31	33229	26	27	29	24	26
11:24:15	31	33586	27	27	28	23	26
11:24:30	31	33594	27	27	28	24	26
11:24:45	31	33182	27	27	28	24	26
11:25:00	31	33162	27	27	28	23	26
11:25:15	31	33506	27	28	28	23	26
11:25:30	31	33633	28	27	28	24	26
11:25:45	31	33866	28	27	28	23	26
11:26:00	31	33362	28	28	28	23	26

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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	mls
Average Leak Rate Over 30 Minute Duration:	0	ml/min
Allowable Leak Rate:	200	ml/min

Total Through Seat Leakage Collected Over 10 Minute Cool Down:	0	mls
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Total Water Volume Lost Over 40 Minute Burn and Cool Down:	24	mls
Water Collected in System Relief Valve:	0	mls
Calculated External Leakage During 40 Minute Duration:	24	mls
Average Leak Rate Over 40 Minute Duration:	1	ml/min
Allowable Leak Rate:	50	ml/min

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

Yarmouth Research and Technology

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:	32.9	psig
Average Pressure During Burn/Cool Down:	31.2	psig
Minimum Pressure During Burn/Cool Down:	29.4	psig

Maximum Body Flame Temperature During Burn:	865.6	deg. C
Average Body Flame Temperature During Burn:	810.0	deg. C

Maximum Bonnet Flame Temperature During Burn:	882.2	deg. C
Average Bonnet Flame Temperature During Burn:	813.9	deg. C

Average of Both Flame Temperatures During Burn:	811.9	deg. C
---	-------	--------

Note

Were Test Conditions Within Compliance?	Yes
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Yarmouth Research and Technology

Post-Burn Seat Test Information

Customer: ValvTechnologies, Inc.

Date: 12/15/2011

Product Code: 2 inch Class 300 Metal-seated Ball Valve

Project Number: PN211088

Test Data

Time	Pressure (psig)	Cal Block Temp - C
11:36:37	548	31
11:36:52	550	31
11:37:07	552	31
11:37:22	553	31
11:37:37	554	31
11:37:52	554	31
11:38:07	555	31
11:38:22	555	31
11:38:37	555	31
11:38:52	555	31
11:39:07	556	31
11:39:22	556	31
11:39:37	556	31
11:39:52	556	31
11:40:07	556	32
11:40:22	556	31
11:40:37	557	32
11:40:52	556	32
11:41:07	557	32
11:41:22	557	32
11:41:37	557	32

Leakages were collected manually.

Total Seat Leakage Collected Over 5 Minute Duration:	70	mls
Average Leak Rate Over 5 Minute Duration:	14	ml/min
Allowable Leak Rate:	40	ml/min
Total External Leakage Collected Over 5 Minute Duration:	20	mls
Average Leak Rate Over 5 Minute Duration:	4.0	ml/min
Allowable Leak Rate:	50	ml/min
Was the Valve Leakage Below the Allowable?	Yes	