

Fire Test Report

ANSI/API Standard 607, Sixth Edition, 2010

ISO 10497:2010

Performed for

ValvTechnologies, Inc.

www.valv.com



3 Inch Class 900 Ball Valve

Product Code: V7C1-RF-RP-B030-023EM-001

Project Number: 211088

October 26, 2011

Performed by

YARMOUTH RESEARCH AND TECHNOLOGY, LLC

434 Walnut Hill Road
North Yarmouth, ME 04097 USA
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Yarmouth Research and Technology, LLC

Customer: ValvTechnologies

Date: 10/26/2011

Specification: ANSI/API Standard 607, Sixth Edition, 2010

ISO 10497: 2010

Product Description: 3 inch Class 900 Ball Valve

Project Number: PN211049

Comments: V7C1-RF-RP-B030-023EM-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:	8:48:00	
Average Pressure During Burn:	1678	psig
Seat Leak Rate During Burn:	0	ml/min
Allowable Seat Leak Rate:	1280	ml/min
External Leak Rate During Burn/Cool Down:	1	ml/min
Allowable External Leak Rate:	320	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	

Post-burn Test Not Required for Pressure Class 900

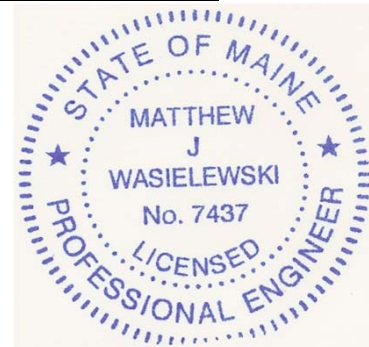
Operational Test

Did Valve Unseat and Open Fully?:	Yes	
Average Pressure During Test:	1672	psig
External Leak Rate After Operating:	0	ml/min
Allowable External Leak Rate:	80	ml/min
Was the Leakage Below the Allowable?	Yes	

Valve Pass or Fail the Test Standard?	PASS
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Witnesses

Matthew J. Wasielewski



YARMOUTH RESEARCH AND TECHNOLOGY, LLC

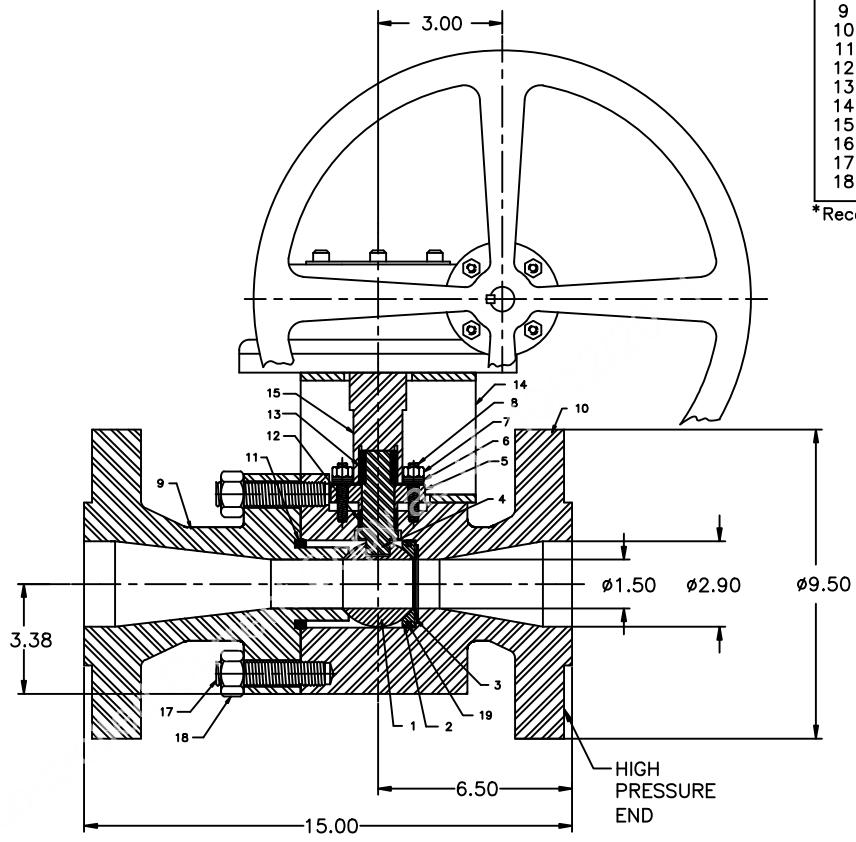
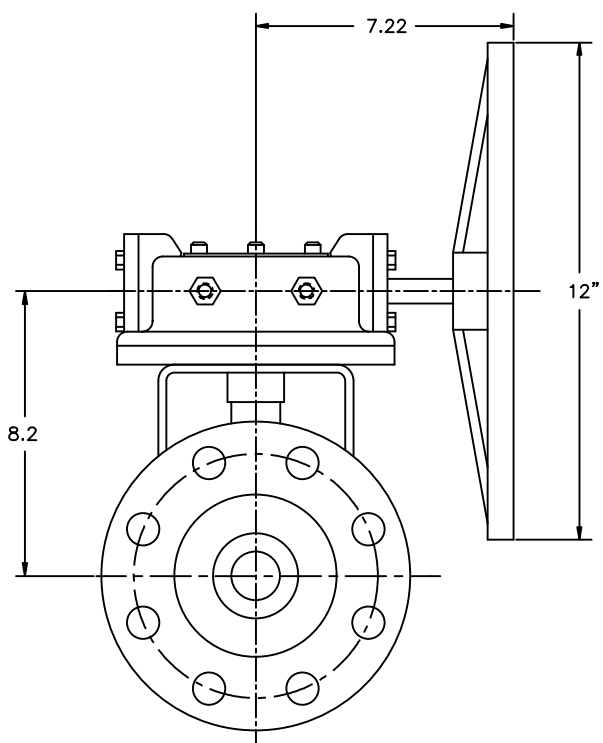
Fire Test Information Sheet

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:	V7C1-RF-RP-B030-023EM-001
Valve Description	Size: 3" Pressure Rating: 900# Pressure Rating at 100F: 2220 psig Type: Seat-Supported Ball Valve Weight: 230 Lbs. Reduced or Full Bore: Reduced Body/Bonnet Material: SA-105 Trim Material: 410SS Seat Material: SA-105 with RAM 31 coating Stem / Body Seal Material: A286/17-4 Bolting Material: B7 Studs/2H Nuts Is valve considered "Soft-Seated"? No
Valve Markings	Nameplate Information: Size, Pressure Class Casting Markings: N/A
Assembly Drawing Number / Revision / Date of Issue:	111160-1 / Rev. 1 / 08/05/11
Assembly Drawing sent to Yarmouth:	Yes
If valve is fitted with gearbox, state gearbox manufacturer, model number and mechanical advantage:	Exeeco IW-3/40, mech. Advantage of 18.
If valve is non-symmetric, state direction of flow for test:	See flow direction as indicated on drawing.
For double-seated valves, state maximum allowable cavity pressure:	N/A
Manufacturer's Contact Name /Date:	Becky Kowen/ 10/18/11

Customer: MDPS
 Project Name: Amal Steam Surface Facilities Proj.
 Project Number: WPR4682
 P.O. Number: MD-431 WPAI

BILL OF MATERIAL			
ITEM	DESCRIPTION	MATERIAL	QTY.
1	BALL	410 S.S./RAM31	1*
2	UPSTREAM SEAT	A182-F22/QPQ	1*
3	BELLEVILLE SPRING	Inc 718	1*
4	STEM	A286/QPQ	1
5	GLAND	A182-F22/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	A105/RAM31	1*
10	BODY	A105	1
11	BODY GASKET	17-4/PT24	1*
12	GLAND PACKING	316 S.S./GRAFOIL	1*
13	KEY	1018	2
14	MOUNTING BRACKET	A500	1
15	DRIVE SLEEVE	4130	1
16	OPERATOR	EXEECO IW-3/40	1
17	BODY STUD	A193 Gr. B7	8
18	BODY NUT	A194 Gr. 2H	8

*Recommended Spare Parts



** Release For Customer Approval

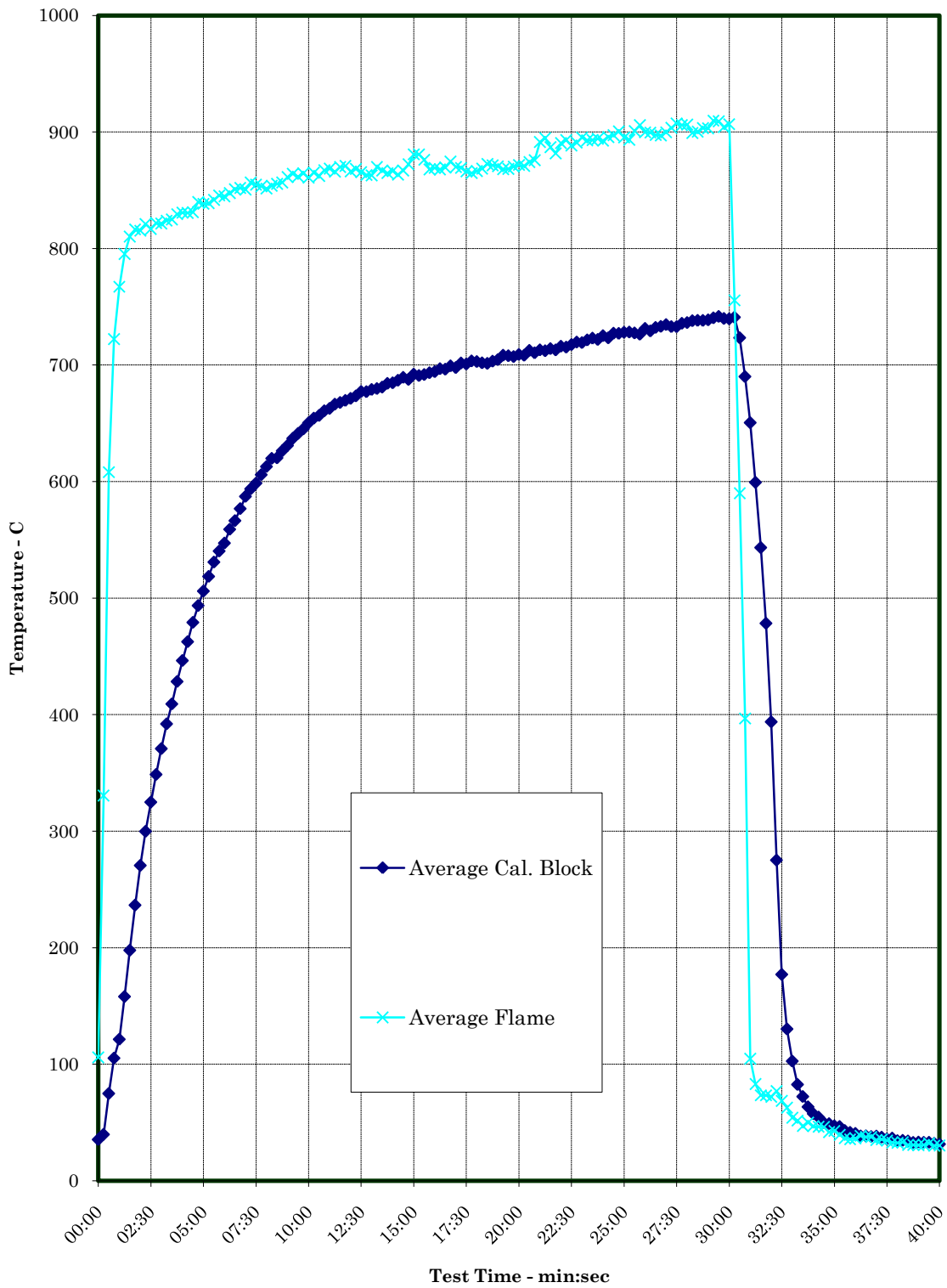
Approx. Total Weight: 230 lbs

CERTIFIED: _____

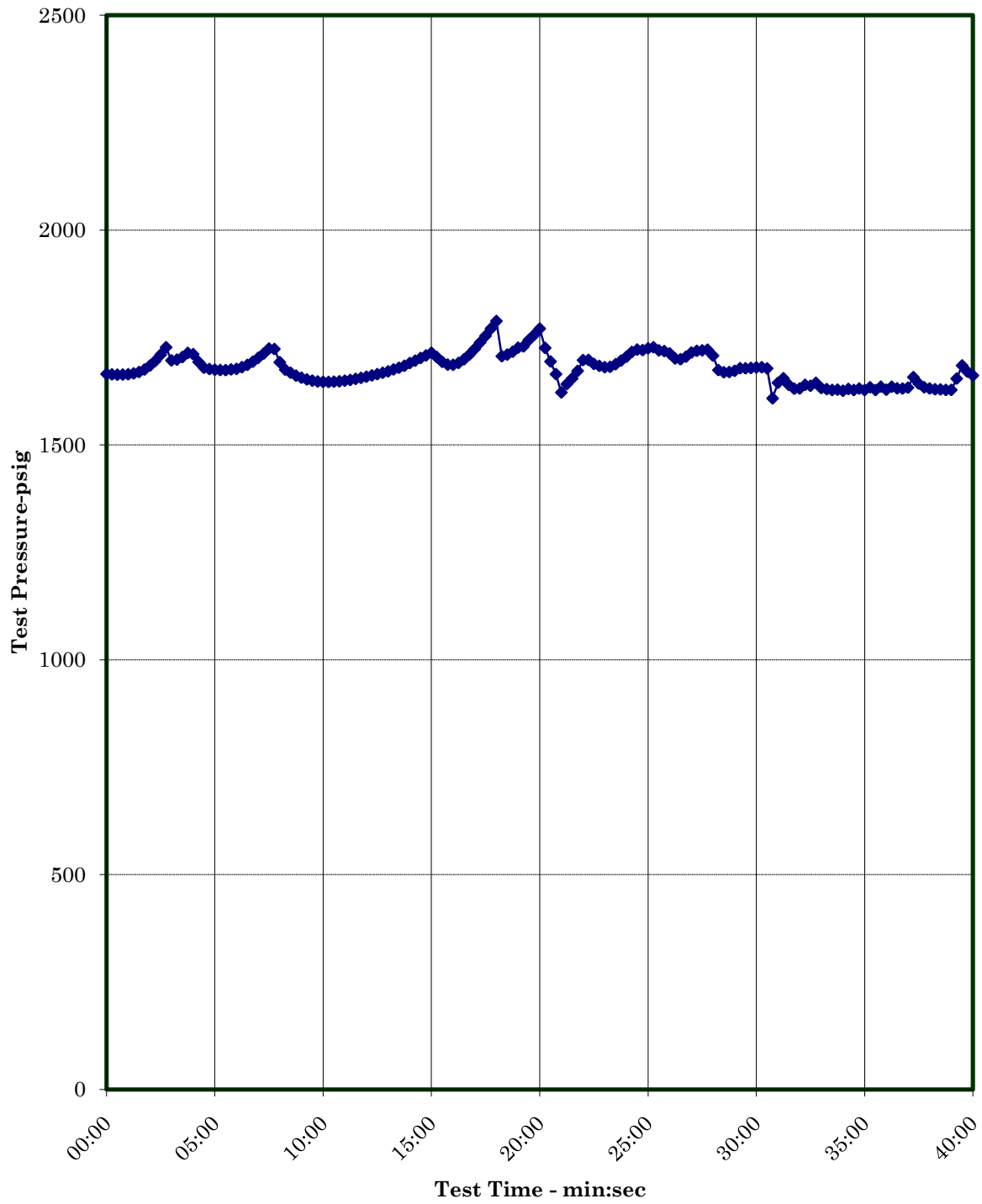
<p>THIRD ANGLE PROJECTION</p> <p>THIS DRAWING AND THE INFORMATION CONTAINED WITHIN IS CONSIDERED TO BE CONFIDENTIAL AND THE SOLE PROPERTY OF VALVETECHNOLOGIES. THE CONTENTS OF THIS DRAWING MAY NOT BE REPRODUCED OR DISCLOSED VERBALLY OR OTHERWISE OUTSIDE THE HOLDERS OFFICE WITHOUT THE WRITTEN APPROVAL OF VALVETECHNOLOGIES.</p>	-	-	-	-	-	-	-	-	DIMENSIONS ARE IN INCHES REMOVE BURRS AND BREAK EDGES UNLESS OTHERWISE SPECIFIED CORNER RADII - .X= ± .XX= ± .XXX= ± CONCENTRICITY ANGULAR= ± SURFACE TEXTURE - MIN. INTERNAL FILLETS -	SCALE NTS	MODEL FILE	SIZE B	<p>5904 BINGLE ROAD, HOUSTON TEXAS 77082 PH: (713) 860-0400 FAX: (713) 860-0499</p> <p>TITLE V7C1-RF-RP-B030-023EM-001, ANSI 900# WITH GEAR OPERATOR EXEECO IW-3/40, SCH 80</p>
	1	08/05/11	UPDATE TRIM CODE & P/N	-	CBS	RSL	SS	-		COATING -	DRAWN BY SC DATE 07/14/11	07/14/11	
	REV	DATE	DESCRIPTION	ECN	BY	CHK	APR	-		CHECKED BY RSL DATE 07/15/11	ENGINEER SS DATE 07/15/11	07/15/11	
	-	-	-	-	-	-	-	-		APPROVED BY SS DATE 07/15/11	-	-	

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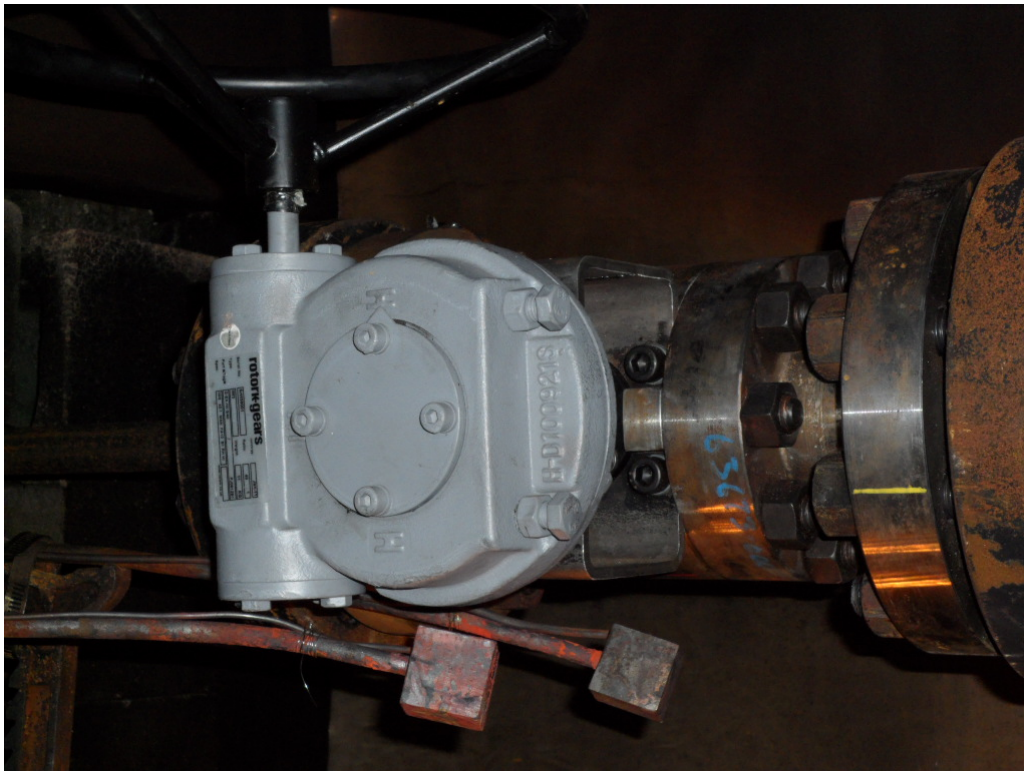
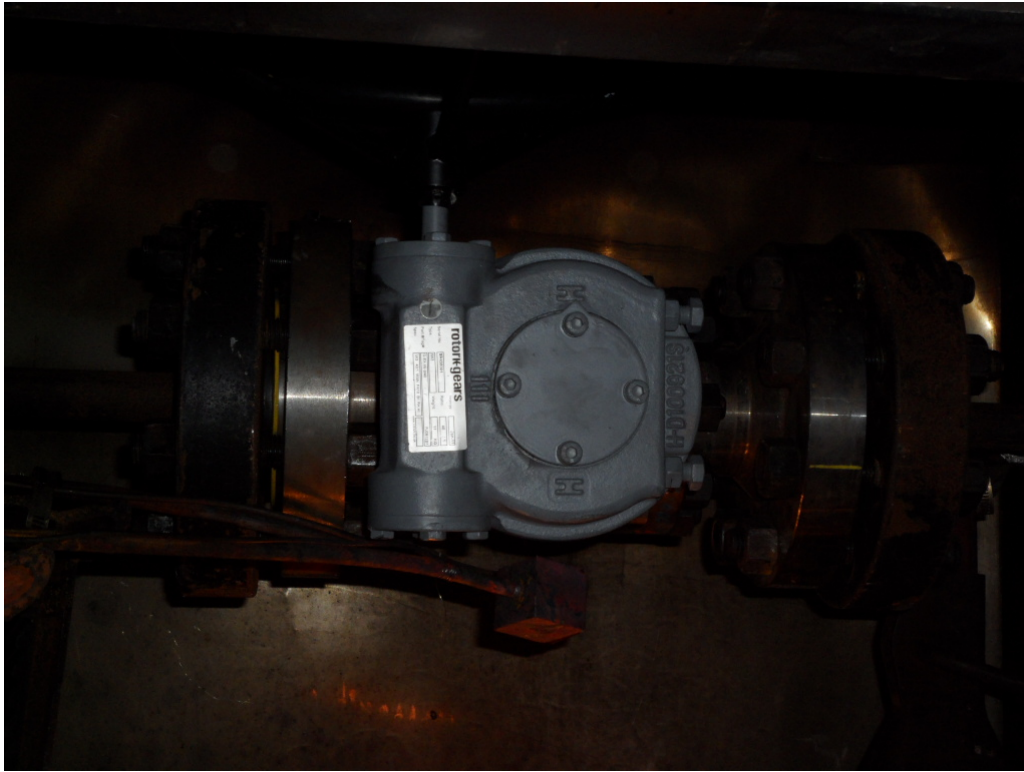
Temperature verses Time Chart



Pressure versus Time Chart



Yarmouth Research and Technology, LLC



Valve Before Test



Valve During Burn

Yarmouth Research and Technology, LLC

Fire Test Information

Customer: ValvTechnologies

Date: 10/26/2011

Product Code: 3 inch Class 900 Ball Valve

Project Number: PN211049

Fire Test Raw Data

Time (EST)	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
8:48:00	1665	40781	37	34	35	161	51	106
8:48:15	1664	40773	43	37	40	393	268	331
8:48:30	1663	40746	78	72	75	728	488	608
8:48:45	1664	40787	108	102	105	827	618	722
8:49:00	1664	40764	123	120	121	857	678	767
8:49:15	1666	40774	157	160	158	878	713	795
8:49:30	1670	40784	196	200	198	885	736	810
8:49:45	1675	40783	236	238	237	890	743	816
8:50:00	1684	40801	272	270	271	887	744	815
8:50:15	1695	40817	303	297	300	893	749	821
8:50:30	1710	40776	332	318	325	882	751	817
8:50:45	1727	40820	358	340	349	891	753	822
8:51:00	1697	40792	383	359	371	886	757	821
8:51:15	1698	40832	407	377	392	892	756	824
8:51:30	1704	40821	429	389	409	889	761	825
8:51:45	1714	40830	451	406	428	899	760	829
8:52:00	1711	40825	471	422	446	900	762	831
8:52:15	1693	40836	489	436	463	900	761	831
8:52:30	1679	40840	507	452	479	896	766	831
8:52:45	1677	40843	522	465	494	911	769	840
8:53:00	1675	40846	538	474	506	912	765	838
8:53:15	1674	40855	552	485	519	909	769	839
8:53:30	1674	40858	566	496	531	917	766	842
8:53:45	1676	40866	578	503	540	918	773	846
8:54:00	1677	40869	589	505	547	922	768	845
8:54:15	1681	40867	601	517	559	924	771	848
8:54:30	1686	40856	611	522	566	930	772	851
8:54:45	1693	40881	621	533	577	933	771	852
8:55:00	1702	40899	629	546	587	931	771	851
8:55:15	1712	40874	638	550	594	935	778	857
8:55:30	1724	40905	646	552	599	937	772	855
8:55:45	1723	40888	653	559	606	934	773	853
8:56:00	1692	40892	659	566	613	931	772	851

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Fire Test Data - continued

8:56:15	1675	40904	666	574	620	933	774	854
8:56:30	1668	40902	672	569	620	934	777	856
8:56:45	1661	40895	678	575	626	938	775	857
8:57:00	1656	40903	682	580	631	946	777	861
8:57:15	1652	40911	688	586	637	948	780	864
8:57:30	1649	40922	692	590	641	943	781	862
8:57:45	1648	40914	697	593	645	946	783	864
8:58:00	1647	40960	701	600	650	943	779	861
8:58:15	1647	40940	704	604	654	947	783	865
8:58:30	1647	40924	708	605	657	937	787	862
8:58:45	1648	40919	711	610	661	947	788	867
8:59:00	1649	40927	714	611	663	951	787	869
8:59:15	1651	40932	718	615	666	947	784	866
8:59:30	1654	40936	720	616	668	954	786	870
8:59:45	1656	40956	722	617	670	955	787	871
9:00:00	1659	40949	725	618	671	952	780	866
9:00:15	1662	40957	727	620	673	952	785	868
9:00:30	1665	40940	729	626	677	949	782	866
9:00:45	1668	40946	731	624	677	941	786	863
9:01:00	1671	40953	732	626	679	941	785	863
9:01:15	1676	40975	734	626	680	954	786	870
9:01:30	1679	40963	735	627	681	946	788	867
9:01:45	1684	40973	736	632	684	946	784	865
9:02:00	1690	40960	738	632	685	951	782	866
9:02:15	1696	40967	739	634	687	941	786	863
9:02:30	1702	40993	741	638	689	947	787	867
9:02:45	1708	40969	742	633	688	957	788	872
9:03:00	1714	40984	743	641	692	969	793	881
9:03:15	1704	40986	746	636	691	969	792	881
9:03:30	1693	40988	747	637	692	962	791	876
9:03:45	1687	40992	748	639	693	949	787	868
9:04:00	1686	40975	749	640	694	947	791	869
9:04:15	1691	40995	750	644	697	946	789	868
9:04:30	1699	40983	751	642	696	951	788	869
9:04:45	1710	41006	752	646	699	963	787	875
9:05:00	1723	41005	754	642	698	953	787	870
9:05:15	1738	41014	754	649	702	948	790	869
9:05:30	1754	41019	757	645	701	947	786	866
9:05:45	1771	41023	757	650	703	942	787	865
9:06:00	1788	41020	759	647	703	946	787	866
9:06:15	1706	41028	760	644	702	946	792	869
9:06:30	1710	41014	761	642	701	953	792	873
9:06:45	1717	41031	762	644	703	954	788	871

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Fire Test Data - continued

9:07:00	1726	41023	763	646	705	951	790	871
9:07:15	1729	41053	764	652	708	947	789	868
9:07:30	1744	41039	766	650	708	942	794	868
9:07:45	1756	41050	766	648	707	948	792	870
9:08:00	1770	41052	768	650	709	955	788	872
9:08:15	1726	41043	768	648	708	951	791	871
9:08:30	1694	41026	769	656	713	954	794	874
9:08:45	1665	41033	771	650	710	959	793	876
9:09:00	1622	41044	772	654	713	986	797	891
9:09:15	1642	41029	773	652	712	989	800	895
9:09:30	1655	41022	774	654	714	978	796	887
9:09:45	1672	41027	776	650	713	968	795	882
9:10:00	1697	41011	777	655	716	981	801	891
9:10:15	1698	41027	778	652	715	983	803	893
9:10:30	1688	41027	780	655	717	969	808	888
9:10:45	1684	41033	782	658	720	974	807	891
9:11:00	1681	41047	783	656	719	982	808	895
9:11:15	1682	41018	783	660	721	978	808	893
9:11:30	1688	41025	784	662	723	980	806	893
9:11:45	1696	41043	786	658	722	981	808	894
9:12:00	1705	41018	787	664	725	982	803	893
9:12:15	1716	41026	789	658	723	986	805	896
9:12:30	1722	41042	789	666	727	988	807	897
9:12:45	1720	41015	791	664	727	987	814	901
9:13:00	1725	41024	791	665	728	986	804	895
9:13:15	1727	41025	792	664	728	978	808	893
9:13:30	1720	41000	793	662	727	993	808	901
9:13:45	1718	41041	794	658	726	997	815	906
9:14:00	1713	41049	794	668	731	994	805	900
9:14:15	1701	41064	796	662	729	988	811	899
9:14:30	1699	41052	796	668	732	984	811	898
9:14:45	1705	41058	797	669	733	988	806	897
9:15:00	1715	41045	798	671	735	994	805	900
9:15:15	1719	41030	799	667	733	998	809	904
9:15:30	1720	41017	799	666	733	1006	809	907
9:15:45	1721	41052	801	671	736	1007	805	906
9:16:00	1708	41051	801	672	736	1002	811	906
9:16:15	1674	41050	802	674	738	991	808	899
9:16:30	1669	41036	802	674	738	994	807	900
9:16:45	1670	41044	803	674	738	995	812	903
9:17:00	1672	41058	804	673	739	988	818	903
9:17:15	1678	41026	804	677	740	1002	818	910
9:17:30	1678	41040	805	678	742	1000	818	909

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Fire Test Data - continued

9:17:45	1679	41042	806	674	740	993	815	904
9:18:00	1680	41066	806	674	740	1003	811	907
9:18:15	1681	41046	805	677	741	781	730	756
9:18:30	1678	41055	794	652	723	587	593	590
9:18:45	1609	39465	777	603	690	444	349	397
9:19:00	1645	40561	753	548	651	131	78	105
9:19:15	1655	40472	715	484	599	90	76	83
9:19:30	1640	40530	661	426	543	83	63	73
9:19:45	1631	38987	578	379	478	86	61	73
9:20:00	1631	40446	456	332	394	83	61	72
9:20:15	1640	40424	269	281	275	92	62	77
9:20:30	1638	40433	123	231	177	67	71	69
9:20:45	1645	40422	78	182	130	61	65	63
9:21:00	1632	40371	64	142	103	56	52	54
9:21:15	1630	40414	58	108	83	56	48	52
9:21:30	1628	40425	54	90	72	53	41	47
9:21:45	1629	40360	53	74	64	55	45	50
9:22:00	1626	40314	52	64	58	53	41	47
9:22:15	1630	40367	51	58	55	50	43	46
9:22:30	1628	40357	49	51	50	50	42	46
9:22:45	1631	40314	47	51	49	47	37	42
9:23:00	1628	40300	46	48	47	47	39	43
9:23:15	1634	40308	45	48	47	42	37	39
9:23:30	1628	40284	43	43	43	38	35	37
9:23:45	1635	40293	42	41	42	38	33	36
9:24:00	1628	40238	41	40	41	38	34	36
9:24:15	1635	40228	39	38	39	43	34	39
9:24:30	1632	40231	38	39	39	42	33	38
9:24:45	1631	40232	38	38	38	43	32	38
9:25:00	1633	40215	37	40	38	39	31	35
9:25:15	1658	40173	37	38	37	41	31	36
9:25:30	1643	40216	36	36	36	39	30	34
9:25:45	1634	40223	34	39	37	37	28	33
9:26:00	1631	40222	33	36	34	36	29	33
9:26:15	1629	40201	34	36	35	37	29	33
9:26:30	1629	40229	33	36	34	34	27	31
9:26:45	1628	40223	32	34	33	34	28	31
9:27:00	1628	40231	32	34	33	33	28	31
9:27:15	1654	40226	31	35	33	34	28	31
9:27:30	1685	40188	31	36	33	36	29	32
9:27:45	1670	40174	29	35	32	33	27	30
9:28:00	1662	40205	29	34	32	33	27	30

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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:	1280	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:	576	mls
Water Collected in System Relief Valve:	550	mls
Calculated External Leakage During 40 Minute Duration:	26	mls
Average Leak Rate Over 40 Minute Duration:	1	ml/min
Allowable Leak Rate:	320	ml/min

Were the Valve Leakages Below the Allowables?	Yes
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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:	1788	psig
Average Pressure During Burn/Cool Down:	1678	psig
Minimum Pressure During Burn/Cool Down:	1609	psig
<hr/>		
Amount of Time of Avg. Cal Block > 650 deg.C:	8.0	minutes
Minimum Allowable Time at Temperature:	15.0	minutes
Maximum Avg Cal Block Temperature:	742	deg. C
Average Cal Block Temperature:	506	deg. C
Lowest Avg Cal. Block Temperature:	32	deg. C
<hr/>		
Maximum Body Flame Temperature During Burn:	818	deg. C
Average Body Flame Temperature During Burn:	776	deg. C
<hr/>		
Maximum Bonnet Flame Temperature During Burn:	1007	deg. C
Average Bonnet Flame Temperature During Burn:	939	deg. C
<hr/>		
Average of Both Flame Temperatures During Burn:	857	deg. C

Note

Were Test Conditions Within Compliance?	Yes
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Yarmouth Research and Technology, LLC

Post-Burn Seat Test Information

Customer: ValvTechnologies

Date: 10/26/2011

Product Code: 3 inch Class 900 Ball Valve

Project Number: PN211049

Test Not Required for Pressure Class 900

Yarmouth Research and Technology, LLC

Operational Test Information

Customer: ValvTechnologies

Date: 10/26/2011

Product Code: 3 inch Class 900 Ball Valve

Project Number: PN211049

Test Data

Time	Pressure (psig)	Cal Block Temp - C
9:37:47	1690	21
9:38:02	1689	21
9:38:17	1683	22
9:38:32	1688	21
9:38:47	1688	21
9:39:02	1689	21
9:39:17	1685	21
9:39:32	1682	20
9:39:47	1679	21
9:40:02	1675	20
9:40:17	1674	20
9:40:32	1670	20
9:40:47	1667	20
9:41:02	1665	20
9:41:17	1662	20
9:41:32	1657	20
9:41:47	1658	20
9:42:02	1653	20
9:42:17	1653	20
9:42:32	1650	21
9:42:47	1648	20

Leakages were collected manually.

Total External Leakage Collected Over 5 Minute Duration:	0.0	mls
Average Leak Rate Over 5 Minute Duration:	0.0	ml/min
Allowable Leak Rate:	80	ml/min

Was the Valve Leakage Below the Allowable?	Yes
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