

Fire Test Report

ANSI/API Standard 607, 7th Edition, 2016

ISO 10497: 2010

API Standard 6FA, Fourth Edition, 2018

Performed for

Remington Valve, LLC

www.remingtonvalve.com



2.0RCV1.1-1500 SW F22 Ball Valve
Valve Code: R020151-12S0-USA

Project Number: 218415

Test Date: January 17, 2019



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: Remington Valve, LLC

Date: 1/17/2019

Specifications: ANSI/API Standard 607, Seventh Edition, 2016 ISO 10497: 2010
API Standard 6FA, Fourth Edition, 2018

Product Description: 2.0RVC1.1-1500 SW F22 Ball Valve

Valve Code: R020151-12S0-USA

Project Number: 218415

Equipment Confirmed to be in Calibration to NIST Standards: Yes

Burn and Cool Down Test

Burn Start Time:	9:15:00	
Average Pressure During Burn:	2725	psig
Seat Leak Rate During Burn:	0	ml/min
Allowable Seat Leak Rate:	800	ml/min
External Leak Rate During Burn/Cool Down:	1.6	ml/min
Allowable External Leak Rate:	200	ml/min
Amount of Time of Avg. Cal. Blocks > 650 deg. C:	23.3	minutes
Were Test Conditions Within Compliance?	Yes	
Were the Valve Leakages Below the Allowables?	Yes	

Operational Test

Average Pressure During Test:	2710	psig
External Leak Rate After Operating:	0	ml/min
API 607 7th Edition Allowable External Leak Rate:	50	ml/min
API 6FA 4th Edition Allowable External Leak Rate:	400	ml/min
Was the Leakage Below the Allowables?	Yes	
Does Valve Pass or Fail the Test Standards?	PASS	

Certified by



Matthew J. Wasielewski, PE

President and Manager

Yarmouth Research and Technology, LLC



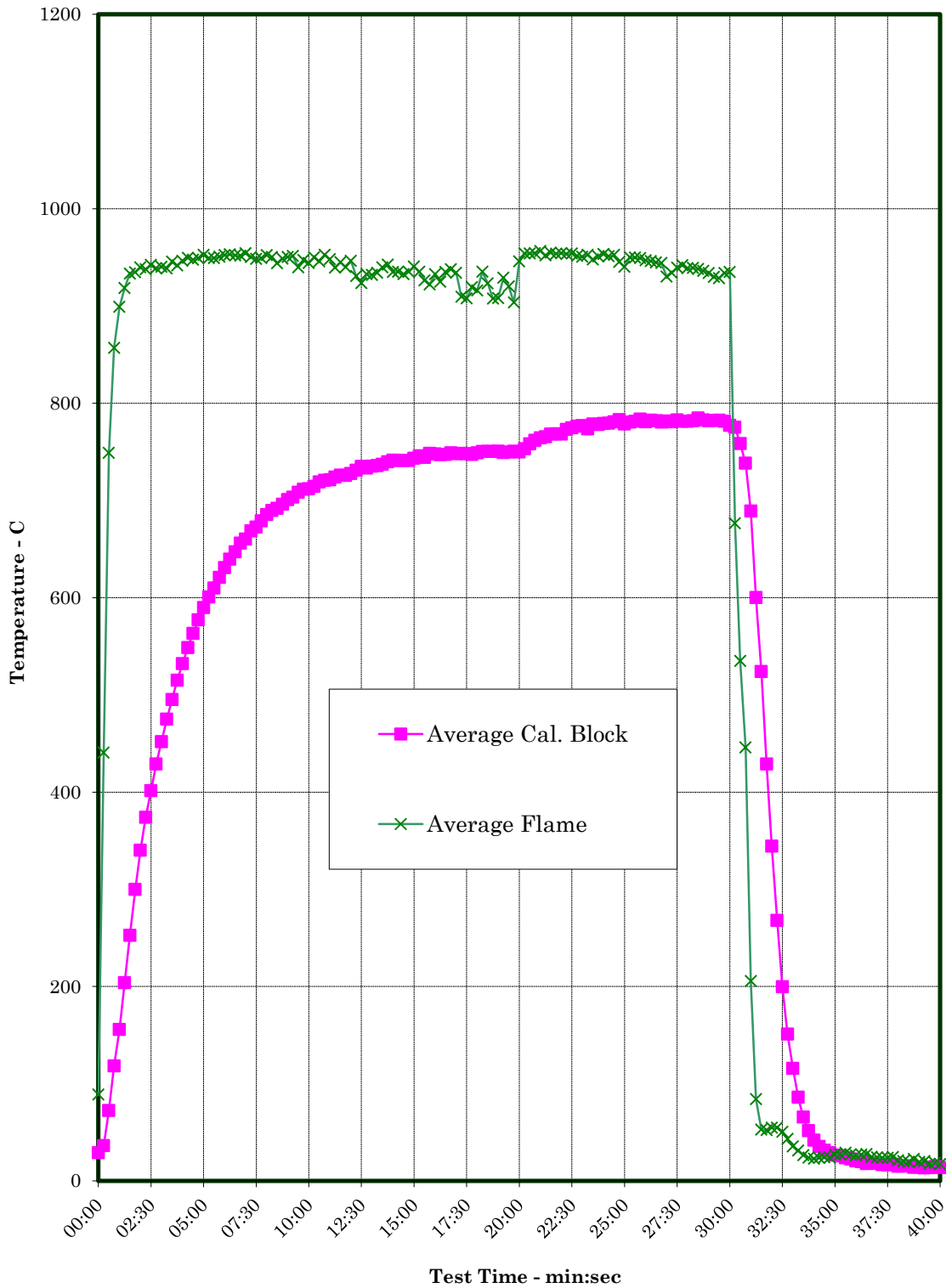
YARMOUTH RESEARCH AND TECHNOLOGY, LLC

Fire Test Information Sheet

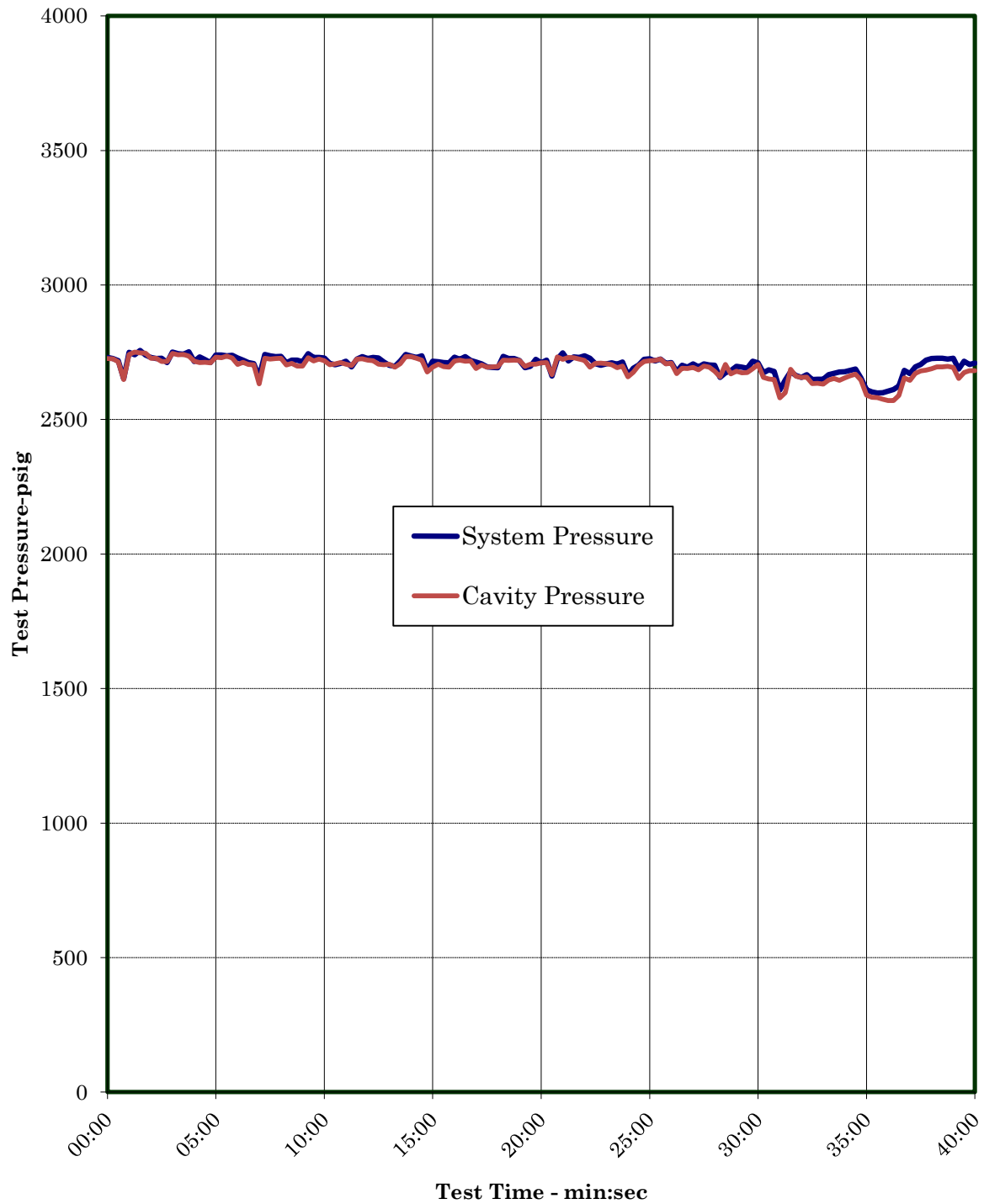
Fire Test Specification and Revision: (ie. API 607 7th, API 6FA 3rd, etc)	API 607 7th & API 6FA 4th
Yarmouth Proposal Number:	218415A
Customer Purchase Order Number:	5932
Customer's Contact Name:	Henry Salem
Valve Manufacturer's Name (used in test report as specified):	Remington Valve, LLC
Company Web Address for Report Cover:	www.remingtonvalve.com
Valve Manufacturer's Address:	706 Nebraska St. South Houston, TX 77587
Did valve meet all required hydrostatic, leakage and other production pressure tests?	Yes
Valve Description for Report Cover:	2.0RCV1.1-1500 SW F22
Valve Product Code:	R020151-12S0-USA
Valve Description	
Size:	2"
Pressure Rating/Class:	1500#
Pressure Rating at 100F:	3750 psi
Type:	Ball
Weight:	~50 lbs.
Reduced or Full Bore:	Reduced
Body/Bonnet Material:	A182-F22
Trim Material:	410 SS Nace
Seat Material:	410 SS Nace
Stem Seal Material:	410 SS Nace
Body Seal Material:	316 SS / Grafoil
Bolting Material:	A193-B16 / A194-Gr 4 or 7
Is valve considered "Soft-Seated"?	No
Valve Markings	
Nameplate Information:	2.0RCV1.1-1500 SW F22
Casting Markings:	n/a
Assembly Drawing Number / Revision / Date of Issue:	R020151-12S0-US / Rev_1 / 04-07-2018
Emailed (PDF) to Yarmouth: Date:	12/17/2018
If valve is fitted with gearbox, state gearbox manufacturer, model number and mechanical advantage:	
If valve is non-symmetric, state direction of flow for test:	
For double-seated valves, state maximum allowable cavity pressure:	5625 psi / uni-directional flow
Form Submission Date:	12/17/2018

SIZE	FSCM NO.	DWG NO.	REV
A		R020151-12S0-US	1
SCALE: NTS			SHEET: 1 OF 1

Temperature verses Time Chart



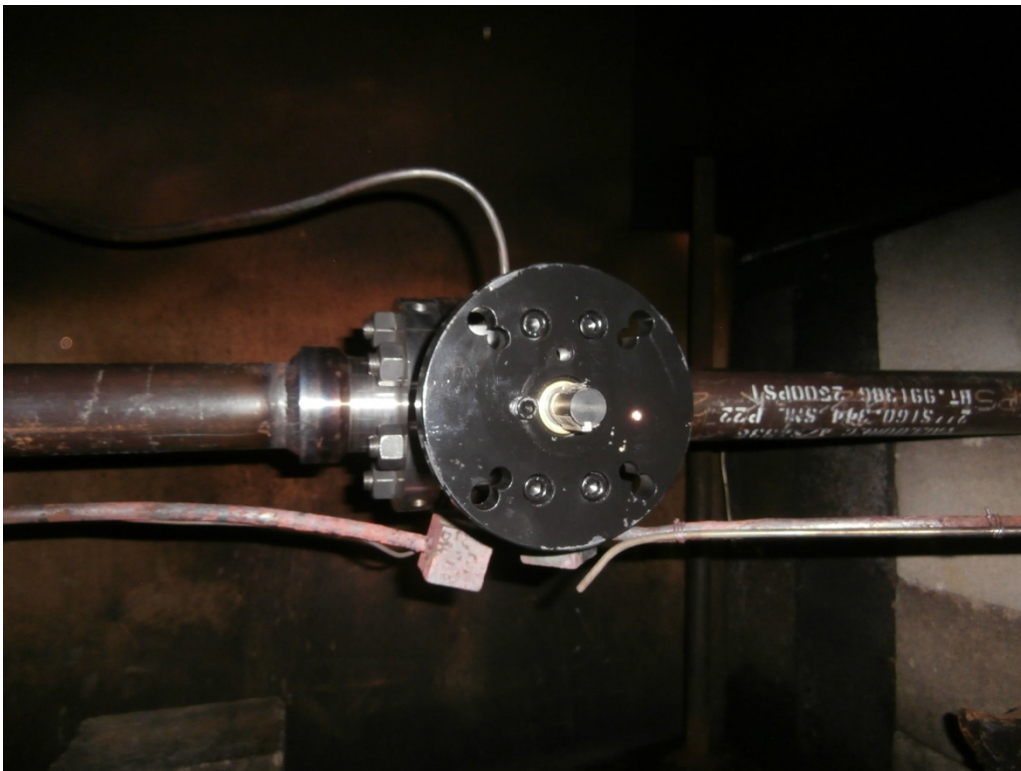
System Pressure verses Time Chart



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Valve Markings



Test Setup Prior to Burn

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Test Valve During Burn

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Fire Test Information

Customer: Remington Valve, LLC

Date: 1/17/2019

Product Code: 2.0RVC1.1-1500 SW F22 Ball Valve

Project Number: 218415

Fire Test Raw Data

Time	Pressure (psig)	Water Volume (mls)	Cavity Pressure (psig)	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
9:15:00	2731	41952	2727	33	25	29	122	56	89
9:15:15	2727	42021	2726	41	32	36	350	531	441
9:15:30	2719	41989	2715	72	73	73	723	775	749
9:15:45	2651	42000	2649	127	109	118	869	844	857
9:16:00	2750	41979	2742	189	123	156	941	858	899
9:16:15	2740	41975	2751	251	157	204	971	867	919
9:16:30	2757	41964	2748	303	202	253	984	883	933
9:16:45	2740	41961	2747	349	251	300	989	881	935
9:17:00	2730	41911	2728	387	293	340	996	884	940
9:17:15	2727	41902	2728	421	327	374	991	884	938
9:17:30	2728	41889	2716	447	356	401	999	886	942
9:17:45	2712	41898	2716	474	383	429	994	884	939
9:18:00	2750	41894	2746	495	408	452	997	884	940
9:18:15	2744	41861	2741	519	431	475	996	882	939
9:18:30	2743	41856	2742	538	453	495	1000	891	946
9:18:45	2752	41870	2736	557	473	515	999	884	942
9:19:00	2716	41856	2717	573	491	532	999	894	946
9:19:15	2733	41840	2712	589	508	549	999	899	949
9:19:30	2722	41824	2713	603	523	563	1001	894	948
9:19:45	2711	41786	2711	618	537	577	1001	898	949
9:20:00	2740	41782	2732	631	549	590	1003	902	953
9:20:15	2739	41755	2730	640	561	601	1003	895	949
9:20:30	2737	41741	2736	649	571	610	1004	894	949
9:20:45	2738	41772	2729	660	582	621	1008	893	951
9:21:00	2728	41752	2705	669	592	631	1004	900	952
9:21:15	2720	41743	2713	678	601	639	1009	897	953
9:21:30	2711	41715	2705	685	609	647	1007	897	952
9:21:45	2707	41704	2704	694	618	656	1006	898	952
9:22:00	2657	41690	2633	699	621	660	1003	906	954
9:22:15	2741	41646	2728	709	628	669	999	902	950
9:22:30	2736	41668	2725	711	634	673	999	897	948
9:22:45	2733	41670	2727	717	641	679	1001	898	949
9:23:00	2735	41654	2728	723	648	685	1005	899	952

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Fire Test Data - continued

9:23:15	2710	41658	2703	728	651	690	1000	901	950
9:23:30	2720	41647	2709	731	653	692	998	889	944
9:23:45	2720	41586	2699	733	659	696	1003	894	949
9:24:00	2715	41593	2699	738	663	701	1002	898	950
9:24:15	2745	41605	2730	742	665	703	997	906	951
9:24:30	2730	41582	2718	747	669	708	995	884	940
9:24:45	2731	41628	2725	750	673	711	998	897	947
9:25:00	2729	41564	2719	751	673	712	997	892	944
9:25:15	2709	41542	2704	754	674	714	1002	898	950
9:25:30	2704	41562	2707	759	679	719	999	893	946
9:25:45	2708	41532	2712	761	681	721	998	907	953
9:26:00	2717	41534	2706	761	682	721	1002	894	948
9:26:15	2695	41483	2701	762	687	724	995	884	939
9:26:30	2725	41487	2725	762	690	726	1000	890	945
9:26:45	2734	41453	2726	762	689	726	1002	878	940
9:27:00	2726	41476	2721	763	693	728	1005	888	946
9:27:15	2731	41436	2719	767	696	731	993	868	931
9:27:30	2729	41472	2706	768	702	735	989	858	924
9:27:45	2714	41471	2704	767	699	733	999	866	933
9:28:00	2701	41420	2706	768	702	735	992	872	932
9:28:15	2698	41398	2695	771	701	736	999	869	934
9:28:30	2718	41439	2708	771	703	737	1004	876	940
9:28:45	2742	41396	2734	774	706	740	998	887	943
9:29:00	2736	41357	2734	775	708	741	1002	868	935
9:29:15	2731	41393	2728	772	710	741	991	880	935
9:29:30	2737	41343	2721	774	708	741	992	873	933
9:29:45	2682	41389	2677	775	707	741	991	879	935
9:30:00	2717	41353	2695	777	710	743	999	882	941
9:30:15	2715	41325	2706	778	713	746	999	871	935
9:30:30	2711	41319	2697	776	712	744	991	862	926
9:30:45	2711	41317	2695	781	716	748	986	859	922
9:31:00	2732	41296	2718	781	715	748	988	878	933
9:31:15	2723	41282	2721	778	716	747	989	861	925
9:31:30	2734	41278	2717	779	716	747	991	879	935
9:31:45	2720	41237	2718	781	717	749	993	883	938
9:32:00	2714	41213	2690	779	717	748	996	872	934
9:32:15	2707	41230	2703	781	716	748	985	834	909
9:32:30	2696	41246	2695	780	716	748	984	832	908
9:32:45	2694	41202	2696	779	716	747	988	851	919
9:33:00	2692	41196	2697	781	717	749	997	836	916
9:33:15	2735	41193	2721	782	718	750	999	871	935
9:33:30	2727	41181	2720	784	716	750	993	854	923
9:33:45	2726	41192	2721	782	718	750	989	826	908

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Fire Test Data - continued

9:34:00	2720	41150	2720	783	718	751	988	828	908
9:34:15	2692	41176	2698	782	717	749	997	862	929
9:34:30	2698	41133	2706	784	716	750	994	846	920
9:34:45	2724	41131	2706	784	717	751	982	826	904
9:35:00	2710	41120	2711	784	715	750	988	904	946
9:35:15	2720	41084	2712	788	718	753	990	918	954
9:35:30	2662	41112	2667	795	721	758	992	917	954
9:35:45	2725	41095	2733	794	729	762	994	914	954
9:36:00	2748	41081	2724	798	731	764	991	922	957
9:36:15	2718	41066	2731	801	731	766	984	919	952
9:36:30	2733	41073	2730	804	733	768	991	919	955
9:36:45	2731	41028	2725	802	735	769	993	914	954
9:37:00	2737	41059	2720	803	733	768	988	921	954
9:37:15	2728	41050	2695	807	739	773	987	920	953
9:37:30	2708	41037	2709	806	743	775	989	919	954
9:37:45	2702	41022	2710	811	742	776	984	919	951
9:38:00	2707	41022	2708	811	743	777	987	914	951
9:38:15	2710	40998	2704	807	741	774	984	921	953
9:38:30	2706	41038	2693	813	744	779	976	919	948
9:38:45	2714	41018	2699	813	743	778	979	922	951
9:39:00	2665	41019	2659	811	747	779	985	922	953
9:39:15	2690	41013	2676	811	748	779	982	920	951
9:39:30	2703	41005	2701	814	748	781	983	922	953
9:39:45	2724	40972	2716	814	752	783	982	909	945
9:40:00	2726	40997	2719	809	748	779	969	912	940
9:40:15	2718	40972	2720	811	751	781	977	923	950
9:40:30	2724	40973	2725	811	752	781	977	922	950
9:40:45	2709	40967	2707	813	754	784	978	920	949
9:41:00	2712	40956	2710	811	751	781	972	922	947
9:41:15	2679	40896	2671	812	753	783	974	918	946
9:41:30	2702	40950	2691	811	753	782	974	915	945
9:41:45	2695	40936	2690	808	753	781	976	913	944
9:42:00	2706	40907	2694	809	754	782	972	889	930
9:42:15	2696	40942	2685	807	754	781	968	900	934
9:42:30	2707	40898	2699	808	757	783	968	911	939
9:42:45	2702	40908	2695	808	755	781	971	913	942
9:43:00	2701	40872	2680	807	756	781	960	918	939
9:43:15	2657	40861	2659	809	754	782	962	917	939
9:43:30	2673	40860	2705	809	760	785	968	908	938
9:43:45	2682	40862	2670	809	757	783	959	913	936
9:44:00	2697	40871	2680	810	754	782	959	908	934
9:44:15	2695	40843	2674	809	756	782	960	900	930
9:44:30	2691	40870	2675	807	758	783	958	899	929

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Fire Test Data - continued

9:44:45	2716	40877	2689	807	756	781	962	906	934
9:45:00	2711	40884	2705	804	751	777	956	914	935
9:45:15	2674	40821	2657	798	752	775	744	608	676
9:45:30	2685	40785	2651	773	744	758	608	462	535
9:45:45	2679	40849	2649	752	725	738	518	373	446
9:46:00	2610	40821	2581	677	702	689	102	309	206
9:46:15	2647	40828	2600	567	633	600	32	136	84
9:46:30	2678	40787	2687	495	553	524	31	75	53
9:46:45	2663	40785	2661	440	418	429	28	77	52
9:47:00	2657	40765	2657	393	296	344	32	78	55
9:47:15	2666	40755	2658	344	192	268	26	84	55
9:47:30	2648	40741	2634	273	127	200	23	78	51
9:47:45	2649	40720	2635	211	91	151	19	67	43
9:48:00	2650	40683	2632	162	69	116	14	57	36
9:48:15	2666	40693	2647	123	49	86	14	48	31
9:48:30	2672	40706	2653	93	38	66	12	41	26
9:48:45	2676	40678	2646	72	32	52	14	34	24
9:49:00	2678	40685	2655	56	28	42	13	33	23
9:49:15	2682	40673	2663	46	26	36	13	34	24
9:49:30	2687	40644	2669	40	23	31	9	39	24
9:49:45	2654	40635	2647	34	24	29	11	37	24
9:50:00	2611	40604	2591	31	22	26	13	41	27
9:50:15	2603	40650	2583	29	22	26	12	43	27
9:50:30	2598	40618	2582	25	22	24	12	46	29
9:50:45	2599	40646	2576	23	22	23	9	45	27
9:51:00	2606	40631	2570	20	21	21	11	41	26
9:51:15	2612	40603	2570	19	21	20	12	42	27
9:51:30	2624	40592	2590	18	17	18	11	44	28
9:51:45	2683	40595	2655	18	19	18	11	39	25
9:52:00	2671	40589	2646	19	17	18	11	37	24
9:52:15	2696	40541	2672	16	17	17	12	36	24
9:52:30	2705	40567	2681	17	16	16	11	37	24
9:52:45	2721	40525	2684	16	18	17	12	37	24
9:53:00	2726	40564	2689	15	15	15	10	32	21
9:53:15	2728	40532	2696	15	16	15	10	31	20
9:53:30	2727	40537	2696	15	16	15	10	29	19
9:53:45	2724	40511	2698	14	14	14	11	34	23
9:54:00	2728	40519	2694	14	14	14	9	29	19
9:54:15	2687	40519	2653	12	15	13	11	30	20
9:54:30	2717	40523	2675	12	15	14	9	26	18
9:54:45	2705	40486	2682	15	14	15	9	28	19
9:55:00	2710	40488	2682	13	14	14	10	24	17

Yarmouth Research and Technology, LLC

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
API 607 7th Edition, API 6FA 4th Edition Allowable Seat Leak Rate:	800	ml/min
Total Through Seat Leakage Collected Over 10 Minute Cool Down:	0	mls
Total Water Volume Lost Over 40 Minute Burn and Cool Down:	1464	mls
Water Collected in System Relief Valve:	1400	mls
Calculated External Leakage During 40 Minute Duration:	64	mls
Average External Leak Rate Over 40 Minute Duration:	1.6	ml/min
API 607 7th Edition, API 6FA 4th Edition Allowable External 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:	2757	psig
Average Pressure During Burn/Cool Down:	2705	psig
Minimum Pressure During Burn/Cool Down:	2598	psig
Amount of Time of Avg. Cal Block > 650 deg.C:	23.3	minutes
Minimum Allowable Time at Temperature:	15.0	minutes
Maximum Avg Cal Block Temperature:	785	deg. C
Average Cal Block Temperature:	546	deg. C
Lowest Avg Cal. Block Temperature:	13.3	deg. C
Maximum Body Flame Temperature During Burn:	923	deg. C
Average Body Flame Temperature During Burn:	882	deg. C
Maximum Bonnet Flame Temperature During Burn:	1009	deg. C
Average Bonnet Flame Temperature During Burn:	976	deg. C
Average of Both Flame Temperatures During Burn:	929	deg. C
Notes		
Were Test Conditions Within Compliance?		Yes

Yarmouth Research and Technology, LLC

Post-Burn Seat Test Information

Customer: Remington Valve, LLC

Date: 1/17/2019

Product Code: 2.0RVC1.1-1500 SW F22 Ball Valve

Project Number: 218415

API 6FA 4th Edition Test Data

This test is not required for this pressure class.

Yarmouth Research and Technology, LLC

Post-Burn Seat Test Information

Customer: Remington Valve, LLC

Date: 1/17/2019

Product Code: 2.0RVC1.1-1500 SW F22 Ball Valve

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API 607 7th Edition Test Data

This test is not required for this pressure class.

Yarmouth Research and Technology, LLC

Operational Test Information

Customer: Remington Valve, LLC

Date: 1/17/2019

Product Code: 2.0RVC1.1-1500 SW F22 Ball Valve

Project Number: 218415

Test Data after Operating Valve

Time	Pressure (psig)	Cal Block Temp - C
10:02:13	2737	18
10:02:28	2730	18
10:02:43	2723	18
10:02:58	2715	18
10:03:13	2716	20
10:03:28	2703	18
10:03:43	2712	18
10:03:58	2704	18
10:04:13	2706	18
10:04:28	2704	19
10:04:43	2701	18
10:04:58	2708	19
10:05:13	2716	19
10:05:28	2706	19
10:05:43	2705	19
10:05:58	2706	18
10:06:13	2695	19
10:06:28	2712	18
10:06:43	2706	21
10:06:58	2703	19
10:07:13	2711	18

Leakages were collected manually.

Total External Leakage Collected Over 5 Minute Duration:	0	mls
Average Leak Rate Over 5 Minute Duration:	0	ml/min
API 607 7th Edition Allowable External Leak Rate:	50	ml/min
API 6FA 4th Edition Allowable External Leak Rate:	400	ml/min

Was the Valve Leakage Below the Allowable?	Yes
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