Fire Test Report

ANSI/API Standard 607, 7th Edition, 2016
ISO 10497: 2010
API Standard 6FA, Fourth Edition, 2018

Performed for

Guide Valve Limited

www.gvs-vci.com

2 inch ANSI Class 900
Full Port 201H Series Floating Ball Valve
Valve Code: 201H

Project Number: 219023
Test Date: January 18, 2019

Performed by

YARMOUTH RESEARCH AND TECHNOLOGY, LLC

434 Walnut Hill Road
North Yarmouth, ME 04097 USA
(207) 829-5359
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Yarmouth Research and Technology, LLC

Customer: Guide Valve Limited	**Date:** 1/18/2019
Specifications: ANSI/API Standard 607, Seventh Edition, 2016 ISO 10497: 2010	
API Standard 6FA, Fourth Edition, 2018	
Product Description: 2" ANSI 900 Full port floating ball valve, 201H series	
Valve Code: 201H	
Project Number: 219023	

Equipment Confirmed to be in Calibration to NIST Standards: Yes

Burn and Cool Down Test

Burn Start Time:	7:38:00	
Average Pressure During Burn:	1698	psig
Seat Leak Rate During Burn:	0	ml/min
Allowable Seat Leak Rate:	800	ml/min
External Leak Rate During Burn/Cool Down:	6	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:	1619	psig
External Leak Rate After Operating:	12	ml/min
API 607 7th Edition Allowable External Leak Rate:	80	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**	

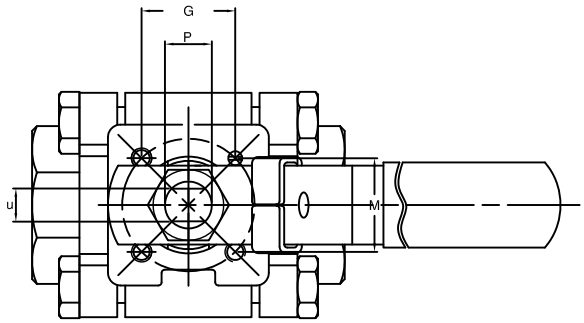
Certified by

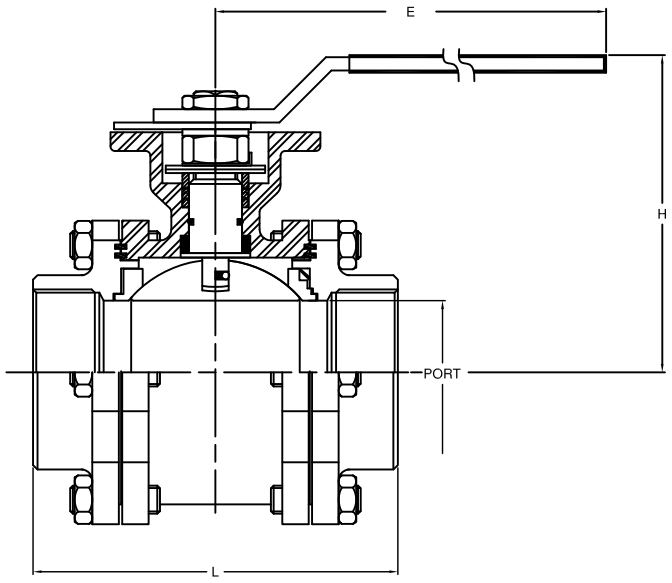
Matthew J. Wasielewski, PE
President and Manager
Yarmouth Research and Technology, LLC

YARMOUTH RESEARCH AND TECHNOLOGY, LLC

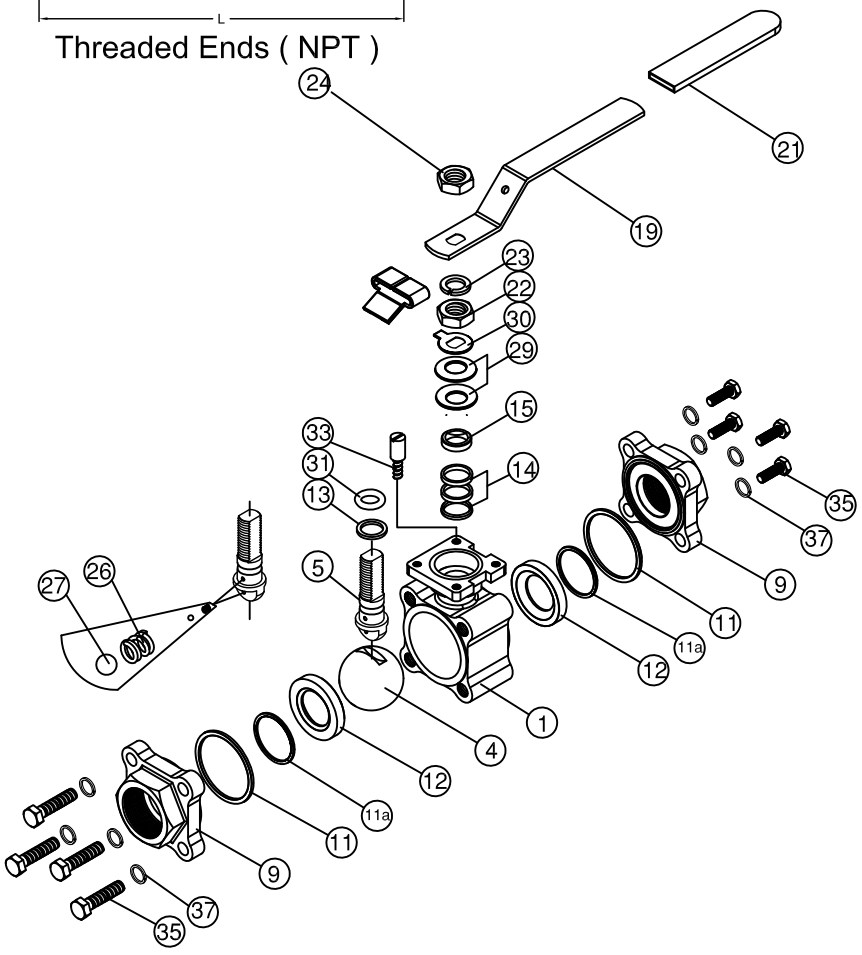
Fire Test Information Sheet

Fire Test Specification and Revision: (ie. API 607 7th, API 6FA 4th, etc)	API 607 and API 6FA
Yarmouth Proposal Number:	219023A
Customer Purchase Order Number:	7182
Customer's Contact Name:	Kevin Yazdi
Valve Manufacturer's Name (used in test report as specified):	Guide Valve Limited
Company Web Address for Report Cover:	GVS-VCI.com
Valve Manufacturer's Address:	51 Terecar Dr. Woodbridge, ON, Canada. L4L 0B5
Did valve meet all required hydrostatic, leakage and other production pressure tests?	Yes
Valve Description for Report Cover:	2" ANSI 900 Full port floating ball valve, 201H series
Valve Product Code:	201H
Valve Description	
Size:	2"
Pressure Rating/Class:	ANSI 900
Pressure Rating at 100F:	2225 pisg
Type:	floating ball valve - soft seated
Weight:	40 lbs
Reduced or Full Bore:	full port
Body/Bonnet Material:	ASTM A352 LCC/LCB, CF8M, WCB
Trim Material:	SS 3016
Seat Material:	Polycarbon, RTFE, Delrin, Devlon, PEEK
Stem Seal Material:	Graphite
Body Seal Material:	Graphite + Elastomeric O-ring
Bolting Material:	A320 L7M -
Is valve considered "Soft-Seated"?	Yes
If valve is fitted with gearbox, state gearbox manufacturer, model # and mech. advantage:	No
State if valve is symmetric or non-symmetric: If non, state direction of flow for test:	Symmetric
For double-seated valves, state maximum allowable cavity pressure:	NA
Is there a reason that test should not measure and record through (seat) leakage?	No
Pre-Test Adjustments, if any:	NA
Valve Markings	
Nameplate Information:	VCI
Casting Markings:	VCI
Assembly Drawing Number / Revision / Date:	
Emailed (PDF) to Yarmouth: Date:	Yes
Form Submission Date:	1/2/2019



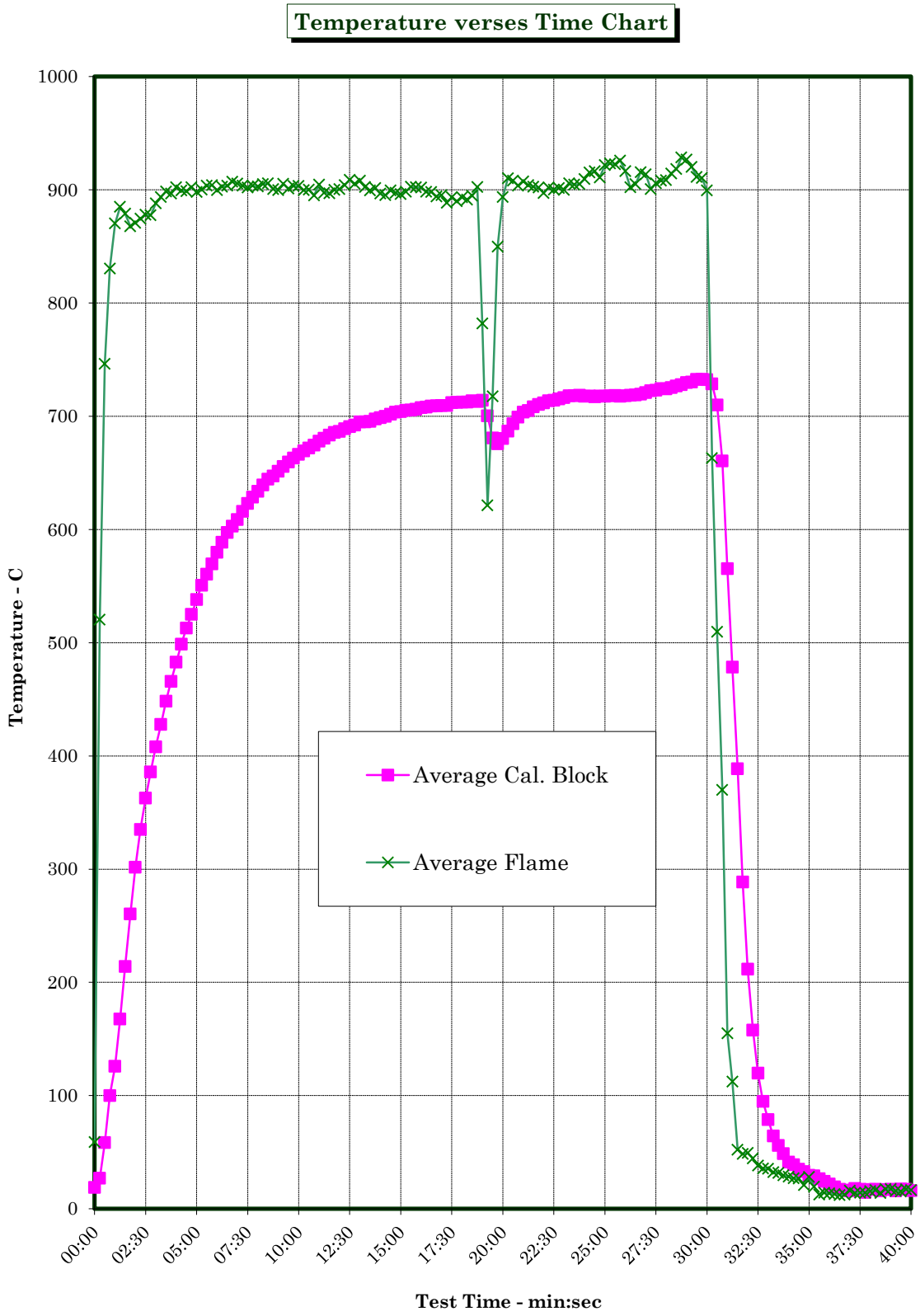


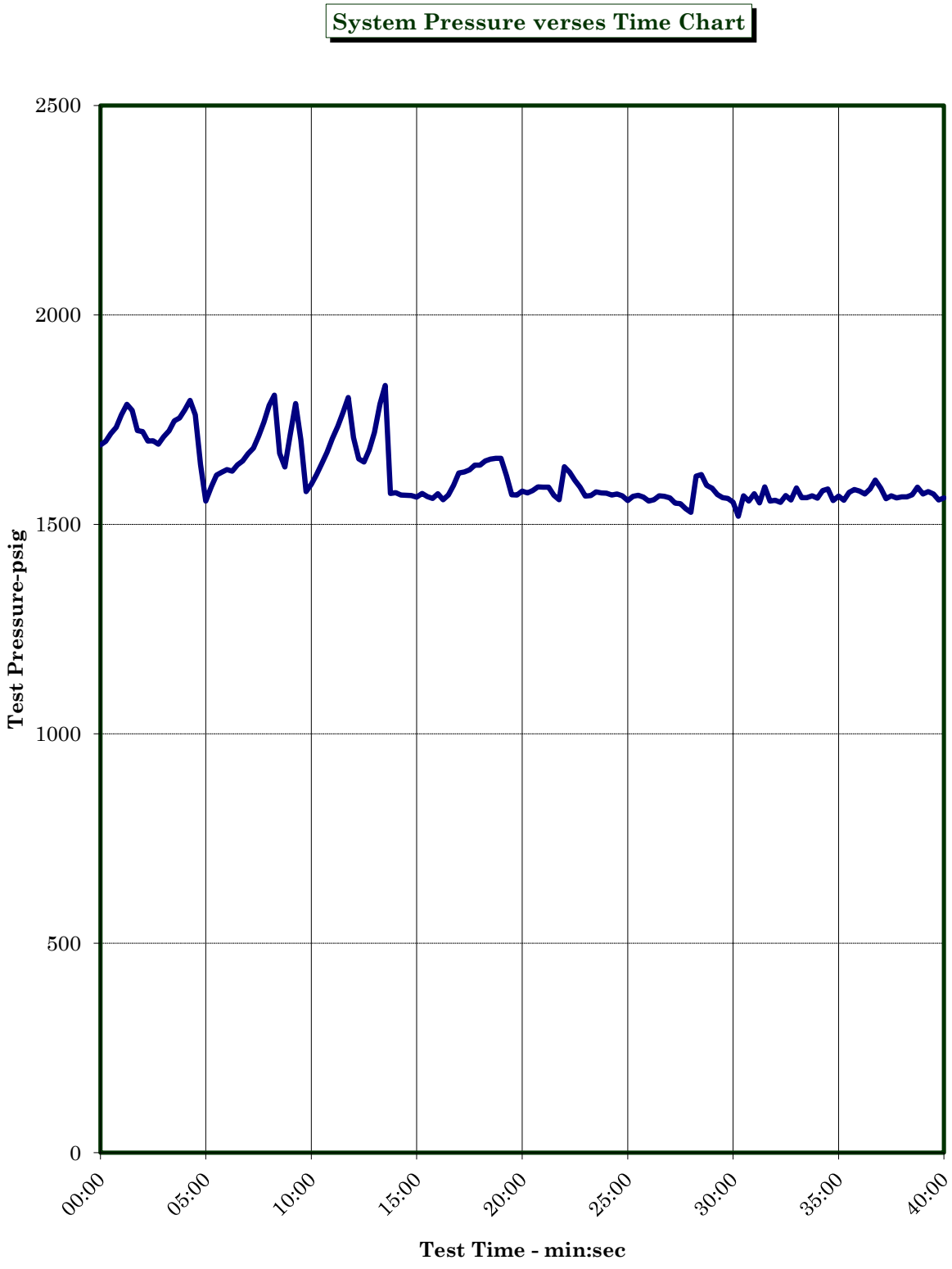
Threaded Ends (NPT)



MATERIALS LIST

NO.	PART NAME	MATERIAL	
1	BODY		
4	BALL	ASTM A351 Gr.CF8M	
5	STEM	S.S.316	
9	END CAP		
11	BODY SEAL	GRAPHITE	
11a	BODY SEAL		
12	SEATS	POLYCARBON	
13 13a	THRUST WASHER	GRAPHITE	
14	STEM PACKING	GRAPHITE	
15	GLAND BUSH	S.S.304	
19	HANDLE	S.S.304	
21	SLEEVE	VINYL GRIP	
22	STEM NUT	S.S.304	
23	HANDLE WASHER	S.S.304	
24	HANDLE NUT	S.S.304	
26	PLUNGER SPRING	S.S.316	
27	ANTI STATIC BALL	S.S.316	
29	BELLEVILLE WASAER	SUS304-USP	
30	STOP	S.S.304	
31	O-RING	FKM	
33	STOP PIN	S.S.304	
35	BODY BOLTS	S.S.316	
37	SPRING WASHER	S.S.304	


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


System Pressure verses Time Chart
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 Markings

Test Setup Prior to Burn

Test Valve During Burn

Fire Test Information

Customer: Guide Valve Limited **Date:** 1/18/2019

Product Code: 2" ANSI 900 Full port floating ball valve, 201H series

Project Number: 219023

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
7:38:00	1690	41781	18	20	19	44	73	59
7:38:15	1699	41787	25	29	27	442	599	520
7:38:30	1718	41793	51	66	58	686	807	746
7:38:45	1732	41782	94	106	100	812	849	831
7:39:00	1762	41761	142	109	126	872	869	870
7:39:15	1787	41784	198	137	168	905	865	885
7:39:30	1772	41785	258	170	214	901	857	879
7:39:45	1724	41782	311	209	260	887	849	868
7:40:00	1722	41763	354	249	302	893	849	871
7:40:15	1699	41759	385	285	335	892	857	874
7:40:30	1700	41787	410	316	363	897	859	878
7:40:45	1692	41766	430	342	386	903	852	878
7:41:00	1709	41759	450	366	408	921	855	888
7:41:15	1724	41771	467	389	428	928	859	894
7:41:30	1747	41756	487	410	448	937	860	899
7:41:45	1754	41790	502	430	466	939	854	897
7:42:00	1774	41778	518	448	483	948	857	902
7:42:15	1796	41769	532	465	499	944	854	899
7:42:30	1761	41817	544	481	513	942	856	899
7:42:45	1643	41780	555	495	525	945	859	902
7:43:00	1556	41783	567	509	538	942	854	898
7:43:15	1589	41752	579	522	551	944	857	900
7:43:30	1618	41762	587	534	561	951	857	904
7:43:45	1625	41790	594	544	569	949	859	904
7:44:00	1631	41777	604	556	580	944	856	900
7:44:15	1627	41764	612	565	589	944	862	903
7:44:30	1642	41778	620	574	597	946	862	904
7:44:45	1652	41786	623	582	603	949	866	907
7:45:00	1668	41771	628	589	609	944	867	906
7:45:15	1682	41747	634	598	616	947	860	904
7:45:30	1711	41769	641	605	623	944	859	902
7:45:45	1744	41759	646	611	629	942	865	904
7:46:00	1784	41796	650	617	634	941	865	903

Fire Test Data - continued

7:46:15	1809	41739	656	623	639	944	866	905
7:46:30	1670	41786	659	629	644	947	865	906
7:46:45	1637	41794	661	634	647	942	859	901
7:47:00	1713	41755	663	639	651	936	863	900
7:47:15	1789	41757	668	643	656	944	866	905
7:47:30	1702	41773	671	648	659	933	869	901
7:47:45	1578	41779	674	652	663	943	863	903
7:48:00	1596	41779	677	656	666	944	862	903
7:48:15	1619	41767	679	659	669	938	861	900
7:48:30	1645	41769	681	663	672	931	870	900
7:48:45	1673	41773	683	666	674	929	861	895
7:49:00	1705	41760	687	669	678	942	867	905
7:49:15	1734	41762	688	673	681	936	859	898
7:49:30	1767	41757	692	675	683	935	859	897
7:49:45	1803	41796	694	677	686	932	868	900
7:50:00	1707	41773	693	680	687	928	873	901
7:50:15	1656	41771	696	682	689	931	877	904
7:50:30	1649	41764	698	684	691	941	877	909
7:50:45	1678	41788	699	686	692	935	876	905
7:51:00	1720	41744	702	688	695	941	876	908
7:51:15	1787	41767	701	689	695	938	867	903
7:51:30	1832	41755	701	691	696	932	867	899
7:51:45	1574	41770	702	693	698	938	865	902
7:52:00	1576	41750	704	693	699	934	859	897
7:52:15	1570	41770	705	695	700	929	861	895
7:52:30	1569	41763	707	697	702	926	873	899
7:52:45	1569	41744	709	698	704	928	867	898
7:53:00	1565	41747	709	699	704	932	861	896
7:53:15	1574	41780	710	701	705	930	867	898
7:53:30	1567	41739	709	702	706	927	878	903
7:53:45	1562	41764	710	702	706	931	873	902
7:54:00	1573	41752	711	704	708	930	874	902
7:54:15	1559	41765	711	705	708	921	876	898
7:54:30	1570	41766	711	707	709	923	873	898
7:54:45	1593	41753	712	707	709	924	864	894
7:55:00	1623	41774	711	708	709	926	865	895
7:55:15	1625	41750	711	708	709	914	863	889
7:55:30	1630	41750	714	710	712	918	868	893
7:55:45	1641	41734	714	710	712	918	862	890
7:56:00	1641	41764	714	711	713	919	867	893
7:56:15	1652	41759	713	712	713	922	861	891
7:56:30	1656	41776	716	712	714	923	866	895
7:56:45	1658	41777	714	712	713	937	868	903

Fire Test Data - continued

7:57:00	1658	41752	715	713	714	807	757	782
7:57:15	1617	41773	693	708	700	626	617	621
7:57:30	1571	41774	666	696	681	604	831	718
7:57:45	1570	41767	660	691	676	822	877	850
7:58:00	1580	41772	668	693	680	892	895	894
7:58:15	1576	41755	678	696	687	926	894	910
7:58:30	1581	41763	689	698	693	931	886	908
7:58:45	1590	41743	697	701	699	937	870	904
7:59:00	1589	41740	703	704	704	947	868	908
7:59:15	1589	41764	706	704	705	942	867	904
7:59:30	1570	41750	709	707	708	939	866	903
7:59:45	1559	41774	712	708	710	939	865	902
8:00:00	1638	41702	714	709	712	934	860	897
8:00:15	1624	41773	717	711	714	937	867	902
8:00:30	1605	41766	716	712	714	931	869	900
8:00:45	1589	41779	718	713	715	934	869	902
8:01:00	1568	41704	719	713	716	936	864	900
8:01:15	1569	41705	721	715	718	938	874	906
8:01:30	1578	41726	721	716	718	933	877	905
8:01:45	1575	41708	722	716	719	933	877	905
8:02:00	1575	41744	719	716	718	934	884	909
8:02:15	1570	41733	720	716	718	939	891	915
8:02:30	1573	41772	719	715	717	941	892	916
8:02:45	1569	41756	720	716	718	939	883	911
8:03:00	1557	41731	719	716	718	946	898	922
8:03:15	1567	41706	720	716	718	939	908	923
8:03:30	1570	41747	719	717	718	934	911	923
8:03:45	1565	41762	717	718	718	940	912	926
8:04:00	1556	41726	718	718	718	942	891	916
8:04:15	1559	41684	719	718	719	937	867	902
8:04:30	1568	41728	719	718	719	936	874	905
8:04:45	1567	41707	719	719	719	933	898	916
8:05:00	1564	41744	720	722	721	935	892	914
8:05:15	1551	41668	721	724	723	922	879	901
8:05:30	1549	41683	721	726	723	937	875	906
8:05:45	1538	41749	722	727	724	926	891	908
8:06:00	1529	41686	721	728	724	924	893	909
8:06:15	1615	41652	722	729	725	942	887	914
8:06:30	1619	41705	725	728	727	952	885	918
8:06:45	1593	41673	727	728	728	954	903	929
8:07:00	1587	41679	730	729	730	947	907	927
8:07:15	1572	41714	731	729	730	950	891	920
8:07:30	1564	41675	734	731	733	954	869	911

Fire Test Data - continued

8:07:45	1562	41702	734	731	733	953	868	911
8:08:00	1554	41718	733	731	732	943	856	899
8:08:15	1519	41660	729	728	729	748	578	663
8:08:30	1569	41625	706	714	710	602	418	510
8:08:45	1556	41673	634	687	661	403	337	370
8:09:00	1573	41600	514	616	565	36	274	155
8:09:15	1552	41492	429	528	478	26	199	112
8:09:30	1590	41440	360	417	389	18	87	52
8:09:45	1556	41375	293	284	289	16	81	48
8:10:00	1558	41379	229	194	212	13	86	49
8:10:15	1553	41317	184	131	158	12	77	44
8:10:30	1569	41283	147	92	120	8	68	38
8:10:45	1558	41338	119	70	95	9	62	36
8:11:00	1587	41272	98	59	79	10	61	35
8:11:15	1564	41229	81	48	64	8	56	32
8:11:30	1564	41218	68	43	56	11	53	32
8:11:45	1569	41227	58	39	49	11	48	29
8:12:00	1562	41184	48	34	41	9	47	28
8:12:15	1581	41198	43	34	39	9	44	27
8:12:30	1585	41180	38	32	35	13	40	27
8:12:45	1557	41159	33	32	33	9	33	21
8:13:00	1568	41170	30	29	29	11	45	28
8:13:15	1558	41134	28	31	29	7	32	19
8:13:30	1576	41102	26	27	26	7	18	13
8:13:45	1583	41069	23	25	24	9	19	14
8:14:00	1580	41113	21	23	22	9	18	14
8:14:15	1573	41080	19	19	19	9	17	13
8:14:30	1585	41064	16	19	17	9	14	12
8:14:45	1606	41103	16	17	16	11	14	13
8:15:00	1587	41002	17	15	16	15	17	16
8:15:15	1562	40994	17	18	18	14	13	14
8:15:30	1569	41019	17	18	17	11	18	14
8:15:45	1563	41011	11	18	14	16	12	14
8:16:00	1566	41052	17	17	17	16	15	16
8:16:15	1566	40977	17	18	17	14	19	16
8:16:30	1571	41024	16	16	16	12	16	14
8:16:45	1589	41031	16	18	17	17	18	18
8:17:00	1573	40984	17	18	17	20	15	18
8:17:15	1578	41051	13	18	16	14	18	16
8:17:30	1573	41040	18	17	18	15	16	15
8:17:45	1558	41023	15	19	17	18	16	17
8:18:00	1563	41042	16	16	16	16	17	16

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:	739	mls
Water Collected in System Relief Valve:	500	mls
Calculated External Leakage During 40 Minute Duration:	239	mls
Average External Leak Rate Over 40 Minute Duration:	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:	1832	psig
Average Pressure During Burn/Cool Down:	1621	psig
Minimum Pressure During Burn/Cool Down:	1519	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:	733	deg. C
Average Cal Block Temperature:	502	deg. C
Lowest Avg Cal. Block Temperature:	14.4	deg. C
Maximum Body Flame Temperature During Burn:	912	deg. C
Average Body Flame Temperature During Burn:	858	deg. C
Maximum Bonnet Flame Temperature During Burn:	954	deg. C
Average Bonnet Flame Temperature During Burn:	915	deg. C
Average of Both Flame Temperatures During Burn:	886	deg. C

Notes

Were Test Conditions Within Compliance?	**Yes**

Post-Burn Seat Test Information

Customer: Guide Valve Limited	**Date:** 1/18/2019
Product Code: 2" ANSI 900 Full port floating ball valve, 201H series	
Project Number: 219023	

API 6FA 4th Edition Test Data

This test is not required for this pressure class.

Post-Burn Seat Test Information

Customer: Guide Valve Limited	**Date:** 1/18/2019
Product Code: 2" ANSI 900 Full port floating ball valve, 201H series	
Project Number: 219023	

API 607 7th Edition Test Data

This test is not required for this pressure class.

Yarmouth Research and Technology, LLC

Operational Test Information

Customer: Guide Valve Limited **Date:** 1/18/2019

Product Code: 2" ANSI 900 Full port floating ball valve, 201H series

Project Number: 219023

Test Data after Operating Valve

Time	Pressure (psig)	Cal Block Temp - C
8:23:13	1644	19
8:23:28	1638	19
8:23:43	1632	19
8:23:58	1618	18
8:24:13	1615	19
8:24:28	1613	19
8:24:43	1614	20
8:24:58	1592	19
8:25:13	1597	19
8:25:28	1587	18
8:25:43	1579	21
8:25:58	1577	17
8:26:13	1603	19
8:26:28	1613	18
8:26:43	1650	18
8:26:58	1648	19
8:27:13	1640	19
8:27:28	1630	18
8:27:43	1622	20
8:27:58	1639	20
8:28:13	1651	17

Leakages were collected manually.

Total External Leakage Collected Over 5 Minute Duration:	60	mls
Average Leak Rate Over 5 Minute Duration:	12	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**