Fire Test Report

ANSI/API Standard 607, Sixth Edition, 2010
ISO 10497:2010

Performed for

Valvtechnologies, Inc.

www.valv.com

2 inch Class 2500
Ball Valve
V021-RF-ST-L020-001AA-001

Project Number: 210175
October 2010

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:**	10/18/2010
Specification:	ANSI/API Standard 607, Sixth Edition, 2010		
	ISO 10497-5:2010		
Product Description:	2 inch Class 2500 Ball Valve		
Project Number:	PN210175		
Comments:	V021-RF-ST-L020-001AA-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:	**14:10:00**	
Average Pressure During Burn:	**4499**	psig
Seat Leak Rate During Burn:	**39**	ml/min
Allowable Seat Leak Rate:	**800**	ml/min
External Leak Rate During Burn/Cool Down:	**0.2**	ml/min
Allowable External Leak Rate:	**200**	ml/min
Amount of Time of Avg. Cal. Blocks > 650 deg. C:	**20.5**	minutes
Were Test Conditions Within Compliance?	**Yes**	
Were the Valve Leakages Below the Allowables?	**Yes**	

Operational Test

Did Valve Unseat and Open Fully?:	**Yes**	
Average Pressure During Test:	**4530**	psig
External Leak Rate After Operating:	**0**	ml/min
Allowable External Leak Rate:	**50**	ml/min
Was the Leakage Below the Allowable?	**Yes**	

Valve Pass or Fail the Test Standard?	**PASS**

Witnesses

VALVE DATASHEET

VALVTECHNOLOGIES
5904 Bingle Road
Houston, TX 77092 - USA
Ph: +1 713 860 0400
Fx: +1 713 860 0499
sales@valv.com
www.valv.com

Project	Fire Test Valve - SO 102521						**Item**	1	
Plant/Unit							**Qty.**	1	
Customer							**Tag No.**		
End User							**Datasheet**	1 **of** 1	
RFQ No.		**Rev.**		**Date**			**VTI Model**	V1	
PO No.		**Rev.**		**Date**			**VTI Code**	V021-RF-ST-L020-001AA-001	
Prop. No.		**Rev.**	0	**Date**	**2-Nov-10**		**Drw No.**		

Fluid | **Service** | **Crit Press** N/A

		Units						Shut-Off
Mass Flow Rate								-
Inlet Pressure (P1)								-
Outlet Pressure (P2)								-
Pressure Drop (ΔP)								CWP
Inlet Temp. (T1)								-
Molecular Weight								-
Ratio Specific Heat								-
Comp. Factor (Z)								-
Flow Coefficient								-
Travel								-
Noise	dBA							-
								-

SERVICE CONDITIONS

LINE

Pipe Line Size & Sch	In	2.0 in.	Matl.
	Out	2.0 in.	Matl.
Pipe Line Insulation		N/A	

VALVE BODY/BONNET

Type		Ball (Seat-Supported)
Size		2.0 in. ASME Class 2500 STD (PN 420)
Design Press/Temp		bar G ℃
Body / End Cap		316H SS / N/A
Body Design		Side-Entry 2-Pieces
Seat Design		Integral Seat Fire Safe
Seal Design		Metal-to-Metal
End Connection	In	RF Flange (Weld-on)
	Out	RF Flange (Weld-on)
Flg. Finish		Per Specification
Studs/Nuts		B8M / 8M
End Ext. Material	In	N/A
	Out	N/A
Flow Direction		Uni-Directional
Grease&Sealant Inj.		N/A
Packing Material		Grafoil® w/ 316SS anti-extrusion Rings
Packing Type		Live-Load

TRIM

Full/Reduced Port	Standard Port
Bore	1.0625 in. Travel 90.0 deg
Characteristic	N/A
Balanced	Unbalanced
Rated Cv	Stages of Press Letdown N/A
Ball Material	410 SS / RAM #31
Upstream Seat	316 SS / QPQ
Spring	Inc 718
Seat Material	316H SS / RAM #31
Stem	A286 / RAM #31
Body Seal	Grafoil®

TEST

Hydro Pressure	Per ANSI B16.34
Leakage Class	Zero Leakage
NACE	N/A
NDE	VTI Standard

ACTUATOR

Actuator Type	Manual Lever		
Mfr. / Model			
Size	N/A	Eff. Area	N/A
On/Off	Yes	Modulating	No
Failure Mode	N/A		
Supply Type	N/A		
Supply Min/Max	/		psig
Actuator Orientation			
Service Factor		Safety Factor	
Handwheel Type	N/A		
Volume Tank	N/A		
Break Torque			in-lbf
Run Torque			in-lbf
Re-Seat Torque			in-lbf

POSITIONER

Positioner Type			
Mfr. / Model			
Input Signal	N/A		
Increasing Signal	N/A		
Cam Characteristic			
Partial Stroke Test	N/A		
Elect. Cert.			

SWITCHES

Type	N/A	Qty.	
Mfr./Model			
Contacts/Rating			
Elec. Cert.			

AIR SET

Air Set Mfr./Model	
Set Pressure	
Press Gauge	

ACCESSORIES

XMTR Mfr./Model	
XMTR Elec. Cert.	
Sol. Mfr. / Model	
Sol. Elec. Cert.	
J. Box Mfr./Model	
J. Box Elec. Cert.	

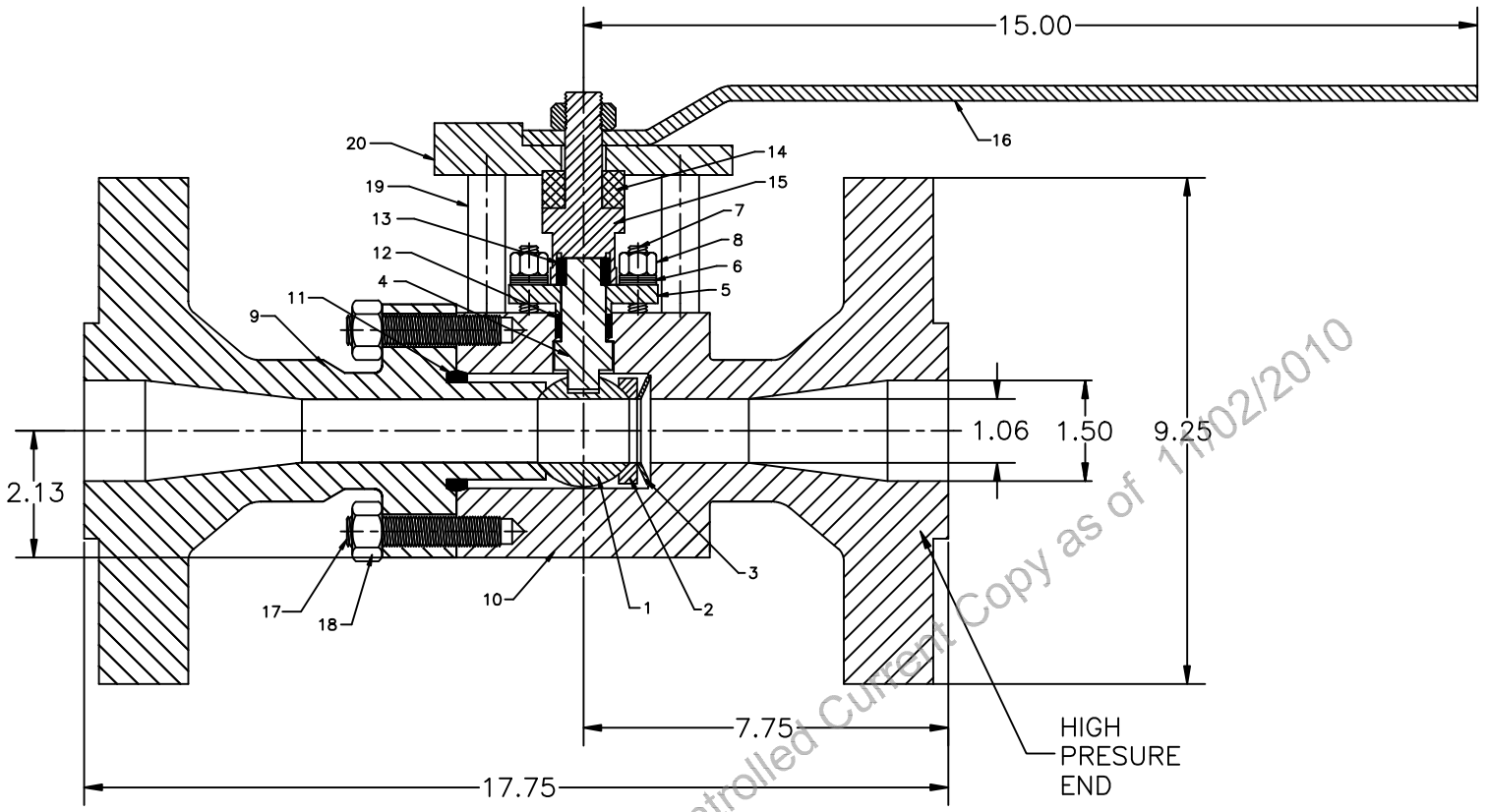
MISC

Open Time (sec.)		Close Time (sec.)	
Valve / Actuator Wt.		/	lbs

NOTES

REVISION LOG

Rev.	Date	Issue Status	Orig.	App.
0	2-Nov-10	Released	DS	



BILL OF MATERIALS

ITEM	DESCRIPTION	MATERIAL	QTY.
1	BALL	410 S.S./RAM31	1
2	UPSTREAM SEAT	316 S.S./QPQ	1
3	BELLEVILLE SPRING	INC 718	1
4	STEM	A286/QPQ	1
5	GLAND	316 S.S./QPQ	1
6	GLAND LOAD SPRING	302 S.S.	24
7	GLAND STUD	A193 Gr. B8M	4
8	GLAND NUT	A194 Gr. 8M	4
9	END CAP	316H/RAM31	1
10	BODY	316H	1
11	BODY SEAL	17-4/PT24	1
12	GLAND PACKING	316 S.S./GRAFOIL	1
13	KEY	1018	1
14	THRUST BEARING	1020/QPQ	1
15	DRIVE SLEEVE	4130	1
16	HANDLE	1018/PVC	1
17	BODY STUD	A193 Gr. B8M	8
18	BODY NUT	A194 Gr. 8M	8
19	YOKE POST	A105	4
20	STOP PLATE	1020	1

** Release For Customer Approval

Approx. Valve Weight: 60 lbs

THIRD ANGLE PROJECTION

REV	DATE	DESCRIPTION	ECN	BY	CHK	APR
–	–	–	–	–	–	–
–	–	–	–	–	–	–
–	–	–	–	–	–	–
–	–	–	–	–	–	–
–	–	–	–	–	–	–

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
MATERIAL – –
COATING – –

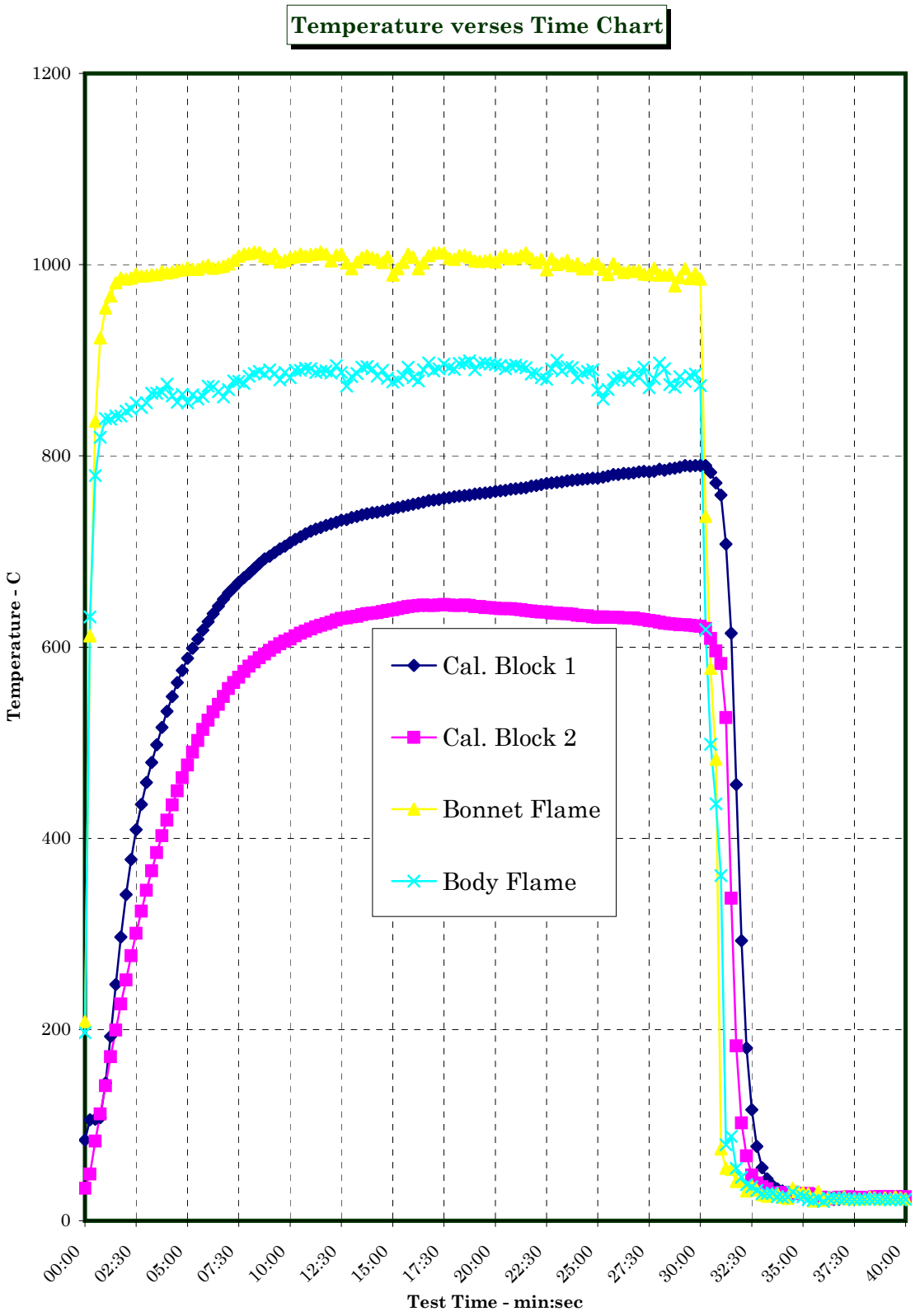
DRAWN BY	SC	DATE 11/01/10
CHECKED BY	RSL	DATE 11/01/10
ENGINEER	SS	DATE 11/1/10
APPROVED BY	SS	DATE 11/1/10

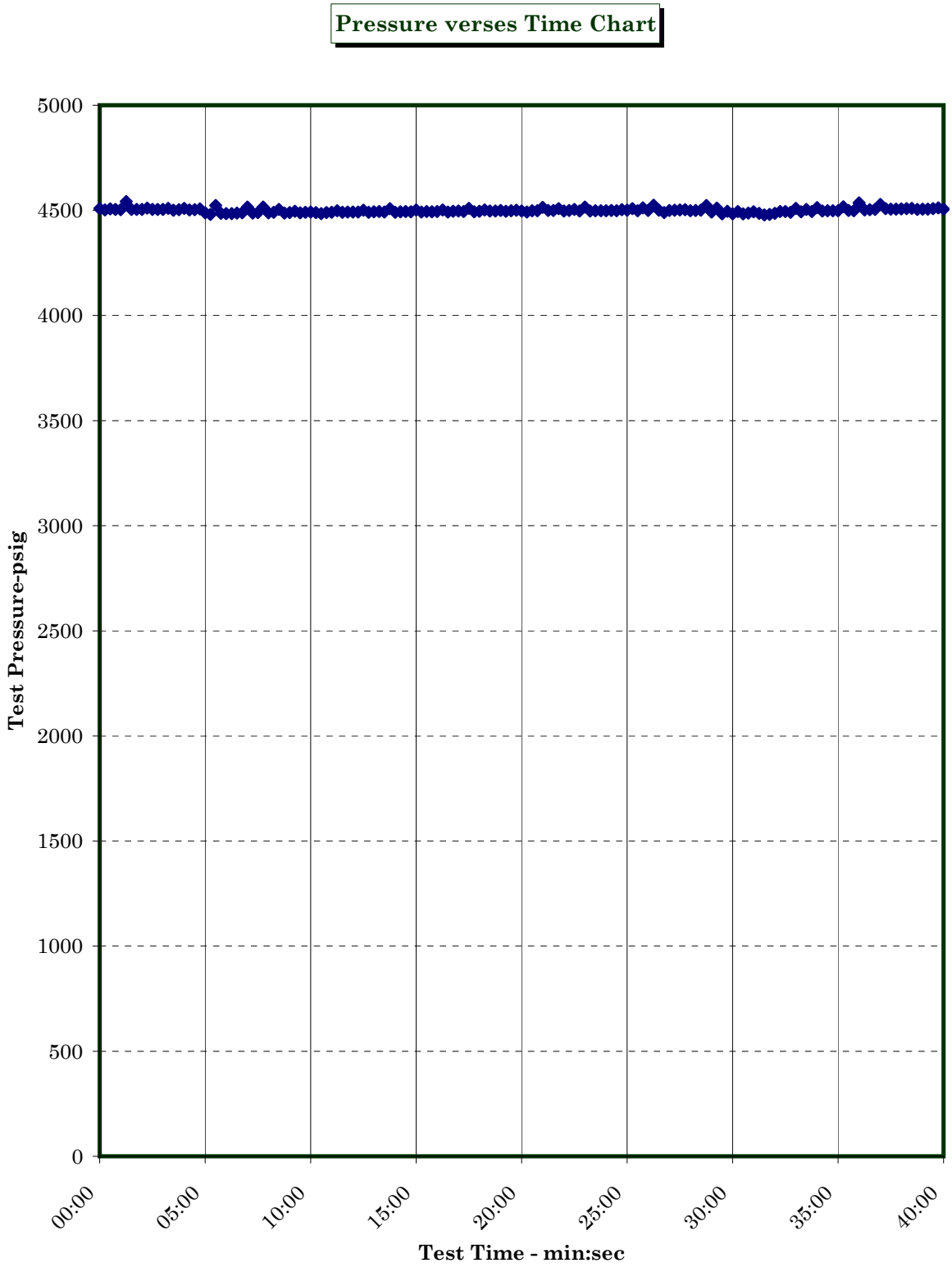
VALVTECHNOLOGIES
5904 BINGLE ROAD, HOUSTON TEXAS 77092
PH: (713) 860-0400 FAX: (713) 860-0499

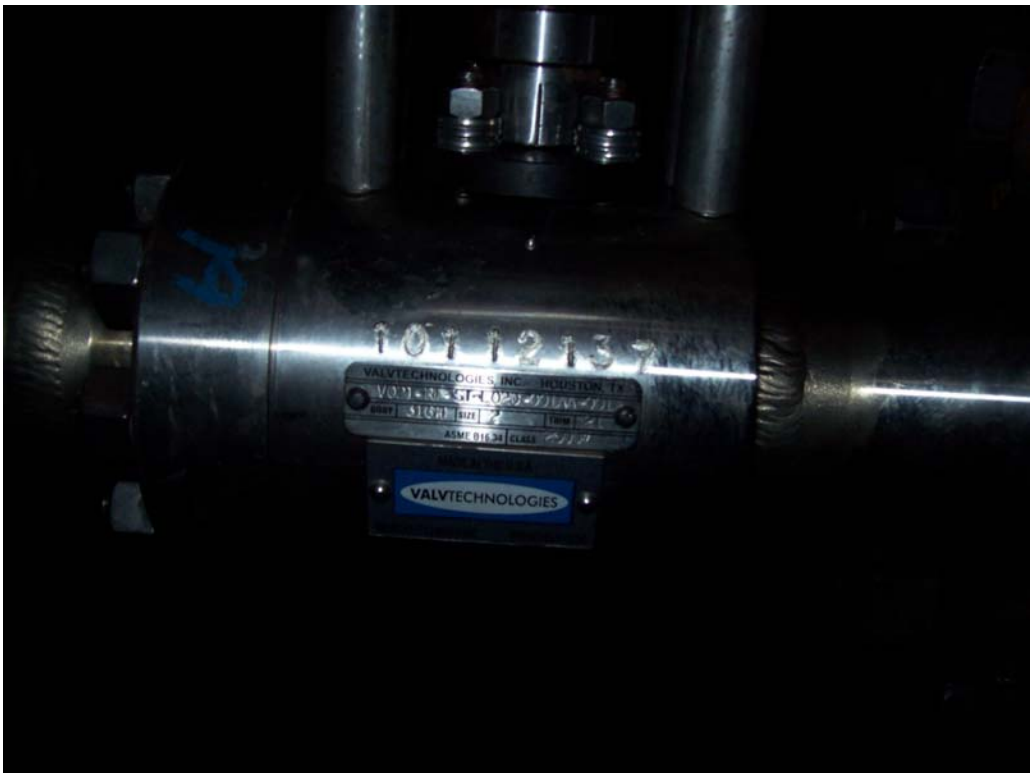
TITLE
V021-RF-ST-L020-001AA-001
WITH LEVER OPERATOR
SCH XXS

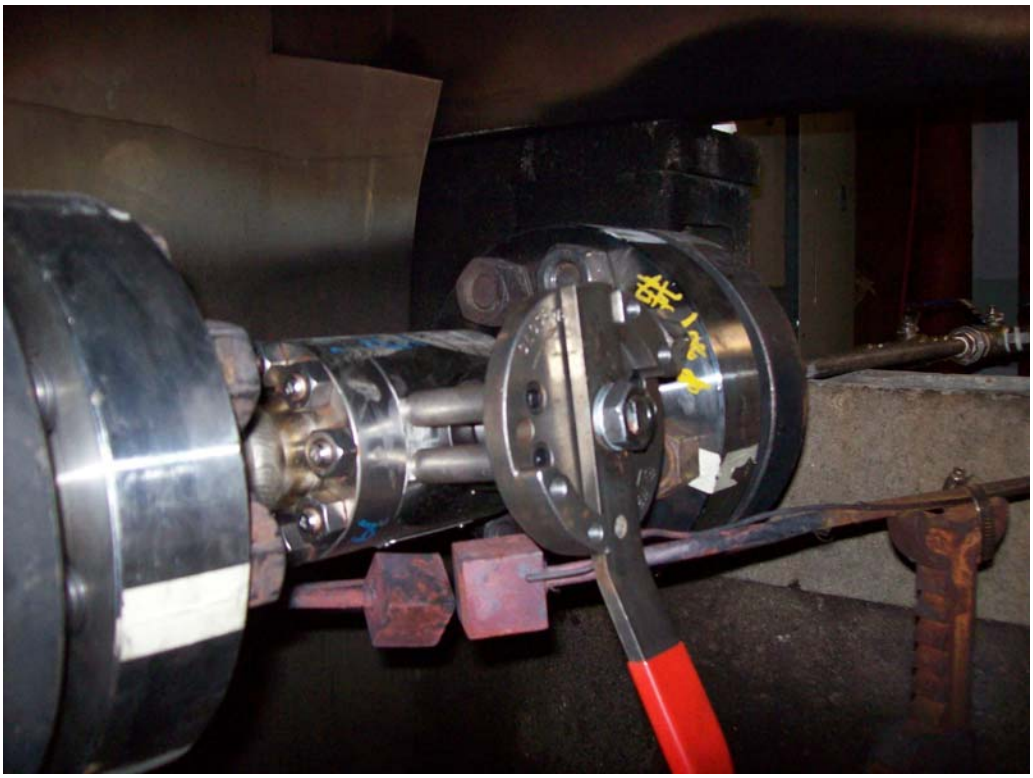
102521-1 REV. 0

SH 1 OF 1


Temperature verses Time Chart
1200
1000
800
600
400
200
0
Temperature - C
Cal. Block 1
Cal. Block 2
Bonnet Flame
Body 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
5000
4500
4000
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 Prior to Test

Valve During Burn.

Fire Test Information

Customer: Valvtechnologies, Inc. **Date:** 10/18/2010

Product Code: 2 inch Class 2500 Ball Valve

Project Number: PN210175

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
14:10:00	4508	31033	84	34	59	208	197	203
14:10:15	4502	31079	106	49	77	612	632	622
14:10:30	4506	31015	106	83	95	836	779	808
14:10:45	4504	31056	108	112	110	923	819	871
14:11:00	4503	31053	144	141	143	954	839	897
14:11:15	4542	31021	193	172	182	967	838	903
14:11:30	4504	30994	247	199	223	981	842	911
14:11:45	4504	31022	297	227	262	986	842	914
14:12:00	4504	31035	341	252	296	985	847	916
14:12:15	4511	30980	378	277	328	986	849	918
14:12:30	4505	31010	409	301	355	990	856	923
14:12:45	4504	31000	436	324	380	988	851	919
14:13:00	4505	30981	458	346	402	988	856	922
14:13:15	4509	30961	479	366	423	989	866	928
14:13:30	4501	30969	498	385	441	989	866	928
14:13:45	4503	30988	516	403	459	993	867	930
14:14:00	4510	30945	533	419	476	991	875	933
14:14:15	4501	30977	548	435	492	992	863	928
14:14:30	4503	30974	563	449	506	994	856	925
14:14:45	4507	30950	576	463	519	994	864	929
14:15:00	4488	30922	588	477	533	997	856	926
14:15:15	4481	30949	599	490	544	995	864	929
14:15:30	4523	30915	608	502	555	995	859	927
14:15:45	4486	30932	618	514	566	998	862	930
14:16:00	4485	30913	627	523	575	999	873	936
14:16:15	4484	29806	635	532	584	996	872	934
14:16:30	4487	30884	643	540	591	997	867	932
14:16:45	4488	30879	650	548	599	998	862	930
14:17:00	4515	30858	657	557	607	1001	869	935
14:17:15	4487	30867	662	563	613	1004	878	941
14:17:30	4490	30888	668	568	618	1009	878	943
14:17:45	4516	30852	673	574	624	1011	876	943
14:18:00	4488	30840	677	580	629	1012	883	948

Fire Test Data - continued

14:18:15	4490	30843	682	584	633	1013	886	950
14:18:30	4505	30826	687	589	638	1013	888	951
14:18:45	4487	30822	692	593	643	1009	886	947
14:19:00	4489	30819	695	597	646	1007	890	948
14:19:15	4496	30800	699	600	649	1011	886	949
14:19:30	4488	30798	703	603	653	1003	879	941
14:19:45	4490	30796	706	606	656	1004	887	946
14:20:00	4492	30772	709	608	659	1007	882	944
14:20:15	4490	30794	713	612	662	1008	889	949
14:20:30	4484	29360	716	614	665	1011	889	950
14:20:45	4489	30758	718	617	668	1009	892	950
14:21:00	4491	30774	721	619	670	1011	891	951
14:21:15	4498	30751	723	621	672	1011	887	949
14:21:30	4490	30757	725	623	674	1013	888	951
14:21:45	4492	30736	727	624	676	1011	889	950
14:22:00	4491	30716	729	626	678	1004	887	945
14:22:15	4492	30732	731	628	679	1010	894	952
14:22:30	4500	30704	733	630	681	1011	887	949
14:22:45	4491	30685	733	631	682	1002	873	937
14:23:00	4493	30703	736	632	684	996	883	939
14:23:15	4494	30680	737	632	684	1003	886	944
14:23:30	4492	30689	738	634	686	1007	893	950
14:23:45	4509	30651	739	635	687	1009	893	951
14:24:00	4491	30647	741	636	688	1007	891	949
14:24:15	4493	30663	741	636	689	1006	883	944
14:24:30	4494	30625	742	637	690	1002	889	946
14:24:45	4493	30636	743	638	691	1008	881	945
14:25:00	4501	30603	745	639	692	989	877	933
14:25:15	4492	30600	746	640	693	996	879	937
14:25:30	4495	30611	747	641	694	1002	883	943
14:25:45	4493	30579	748	642	695	1011	893	952
14:26:00	4494	30578	749	643	696	1008	882	945
14:26:15	4502	30583	751	643	697	996	878	937
14:26:30	4492	30557	752	644	698	1002	890	946
14:26:45	4495	30579	753	643	698	1009	897	953
14:27:00	4497	30530	754	643	699	1012	889	951
14:27:15	4494	30542	754	644	699	1012	891	952
14:27:30	4509	30533	756	644	700	1012	896	954
14:27:45	4494	30516	756	644	700	1007	892	949
14:28:00	4496	30535	757	643	700	1006	891	948
14:28:15	4502	30524	758	643	701	1009	897	953
14:28:30	4496	30482	758	644	701	1010	897	954
14:28:45	4497	30533	759	643	701	1008	899	954

Fire Test Data - continued

14:29:00	4499	30506	760	642	701	1004	890	947
14:29:15	4496	30473	761	642	701	1003	897	950
14:29:30	4498	30498	761	641	701	1004	897	951
14:29:45	4501	30453	762	641	701	1005	896	951
14:30:00	4497	30462	763	641	702	1003	896	949
14:30:15	4492	30461	763	640	702	1008	894	951
14:30:30	4498	30454	764	640	702	1010	891	951
14:30:45	4498	30427	765	640	703	1006	894	950
14:31:00	4514	30410	766	639	703	1007	895	951
14:31:15	4499	30426	766	639	703	1009	893	951
14:31:30	4500	30441	767	638	703	1012	892	952
14:31:45	4508	30407	768	638	703	1007	886	946
14:32:00	4497	30419	769	637	703	1002	887	944
14:32:15	4500	30408	770	637	703	1006	882	944
14:32:30	4504	30385	771	637	704	994	880	937
14:32:45	4497	30407	772	636	704	1006	891	949
14:33:00	4515	30366	772	636	704	1000	900	950
14:33:15	4496	30362	773	635	704	1002	889	945
14:33:30	4498	30382	774	635	704	1004	893	949
14:33:45	4499	30351	774	634	704	999	892	946
14:34:00	4498	30333	775	633	704	1001	882	941
14:34:15	4499	30344	776	633	704	996	887	941
14:34:30	4498	30327	776	633	704	996	888	942
14:34:45	4504	30318	777	632	704	1001	890	946
14:35:00	4500	30300	777	631	704	1001	869	935
14:35:15	4509	30273	778	632	705	995	859	927
14:35:30	4498	30290	779	631	705	989	869	929
14:35:45	4512	30262	781	631	706	1001	879	940
14:36:00	4500	30250	781	631	706	996	882	939
14:36:15	4525	30230	782	631	706	992	883	938
14:36:30	4500	30233	782	631	706	993	879	936
14:36:45	4489	28681	782	631	706	993	886	939
14:37:00	4499	30233	783	629	706	994	882	938
14:37:15	4500	30215	784	629	706	990	893	941
14:37:30	4501	30217	783	628	706	989	871	930
14:37:45	4503	30188	784	627	706	996	881	938
14:38:00	4499	30171	786	626	706	989	897	943
14:38:15	4499	30178	785	625	705	989	891	940
14:38:30	4501	30157	787	624	706	990	874	932
14:38:45	4523	30094	787	624	706	978	872	925
14:39:00	4492	30146	788	623	706	987	883	935
14:39:15	4510	30129	790	623	707	996	878	937
14:39:30	4484	30123	789	623	706	986	884	935

Fire Test Data - continued

14:39:45	4496	30090	790	622	706	991	886	938
14:40:00	4483	30106	790	622	706	985	873	929
14:40:15	4494	30095	790	619	705	737	618	678
14:40:30	4484	30088	783	609	696	578	498	538
14:40:45	4487	30037	772	596	684	483	436	459
14:41:00	4493	30013	759	583	671	75	361	218
14:41:15	4486	30005	708	526	617	55	79	67
14:41:30	4478	29973	614	337	476	54	88	71
14:41:45	4481	29952	456	183	319	41	55	48
14:42:00	4485	29909	293	102	198	42	46	44
14:42:15	4495	29939	181	68	124	31	38	34
14:42:30	4494	29941	116	48	82	37	36	36
14:42:45	4491	29932	78	39	59	32	32	32
14:43:00	4510	29892	56	36	46	27	28	28
14:43:15	4493	29919	44	33	39	26	28	27
14:43:30	4504	29858	37	29	33	28	29	28
14:43:45	4494	29889	33	29	31	28	25	27
14:44:00	4514	29851	31	29	30	24	24	24
14:44:15	4497	29824	29	29	29	23	25	24
14:44:30	4498	29887	29	29	29	34	30	32
14:44:45	4498	29824	28	28	28	31	26	28
14:45:00	4498	29829	28	28	28	29	25	27
14:45:15	4517	29641	27	28	28	28	22	25
14:45:30	4499	29719	27	27	27	21	21	21
14:45:45	4499	30087	25	23	24	31	23	27
14:46:00	4536	29668	24	24	24	21	20	21
14:46:15	4502	29897	23	23	23	24	23	24
14:46:30	4503	29721	22	23	23	24	24	24
14:46:45	4504	29709	22	24	23	24	23	24
14:47:00	4528	29905	23	24	23	25	23	24
14:47:15	4509	29752	22	25	24	23	23	23
14:47:30	4506	29694	23	24	23	23	22	23
14:47:45	4506	29856	23	24	24	23	22	23
14:48:00	4506	29718	23	24	23	23	22	23
14:48:15	4509	29800	23	24	24	24	23	24
14:48:30	4510	29750	23	25	24	24	23	23
14:48:45	4504	29813	23	25	24	23	22	23
14:49:00	4505	29805	23	25	24	24	22	23
14:49:15	4505	29803	23	25	24	23	22	23
14:49:30	4508	29771	23	25	24	25	22	24
14:49:45	4512	29780	23	25	24	24	22	23
14:50:00	4506	29765	24	25	24	23	22	23

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:	1180	mls
Average Leak Rate Over 30 Minute Duration:	39	ml/min
Allowable Leak Rate:	800	ml/min

Total Through Seat Leakage Collected Over 10 Minute Cool Down:	80	mls

Total Water Volume Lost Over 40 Minute Burn and Cool Down:	1268	mls
Water Collected in System Relief Valve:	0	mls
Calculated External Leakage During 40 Minute Duration:	8	mls
Average Leak Rate Over 40 Minute Duration:	0.2	ml/min
Allowable Leak Rate:	200	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:	4541.6	psig
Average Pressure During Burn/Cool Down:	4499.3	psig
Minimum Pressure During Burn/Cool Down:	4477.9	psig
Amount of Time of Avg. Cal Block > 650 deg.C:	20.5	minutes
Minimum Allowable Time at Temperature:	15.0	minutes
Maximum Avg Cal Block Temperature:	706.7	deg. C
Average Cal Block Temperature:	498.2	deg. C
Lowest Avg Cal. Block Temperature:	22.8	deg. C
Maximum Body Flame Temperature During Burn:	900.0	deg. C
Average Body Flame Temperature During Burn:	871.8	deg. C
Maximum Bonnet Flame Temperature During Burn:	1013.3	deg. C
Average Bonnet Flame Temperature During Burn:	989.1	deg. C
Average of Both Flame Temperatures During Burn:	930.4	deg. C

Note

Were Test Conditions Within Compliance?	**Yes**

Post-Burn Seat Test Information

Customer: Valvtechnologies, Inc.	**Date:** 10/18/2010
Product Code: 2 inch Class 2500 Ball Valve	
Project Number: PN210175	

This test not required for this pressure class valve.

Yarmouth Research and Technology

Operational Test Information

Customer: Valvtechnologies, Inc. **Date:** 10/18/2010

Product Code: 2 inch Class 2500 Ball Valve

Project Number: PN210175

Test Data

Time	Pressure (psig)	Cal Block Temp - C
14:57:03	4531	27
14:57:18	4527	27
14:57:33	4526	27
14:57:48	4528	27
14:58:03	4529	27
14:58:18	4529	27
14:58:33	4531	27
14:58:48	4533	27
14:59:03	4532	27
14:59:18	4537	27
14:59:33	4529	27
14:59:48	4527	27
15:00:03	4524	28
15:00:18	4526	27
15:00:33	4527	27
15:00:48	4528	27
15:01:03	4530	27
15:01:18	4531	27
15:01:33	4532	28
15:01:48	4534	28
15:02:03	4535	27

Leakages were collected manually.

Total External Leakage Collected Over 5 Minute Duration:	0	mls
Average Leak Rate Over 5 Minute Duration:	0	ml/min
Allowable Leak Rate:	50	ml/min

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