Fire Test Report

ANSI/API Standard 607, 8th Edition, 2022
Modified for External Leakage Only

Performed for

Crane ChemPharma Flow Solutions

www.cranecpe.com

2 inch L067FT Class 150 Plug Valve
Valve Code: SPV-L00037

Project Number: 222341
Test Date: November 28, 2022

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:	Crane ChemPharma Flow Solutions	**Date:**	11/28/2022
Specification:	ANSI/API Standard 607, Eighth Edition, October 2022		
	Modified for External Leakage Only		
Product Description:	2" L067FT Class 150 Plug Valve		
Valve Code:	SPV-L00037		
Project Number:	222341		

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:	10:22:00	
Average Pressure During Burn:	218	psig
External Leak Rate During Burn/Cool Down:	0	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:	216	psig
External Leak Rate After Operating:	0	ml/min
Allowable External Leak Rate:	50	ml/min
Was the Leakage Below the Allowable?	Yes	
Does Valve Pass or Fail the Test Standard?	**PASS**	

Certified by

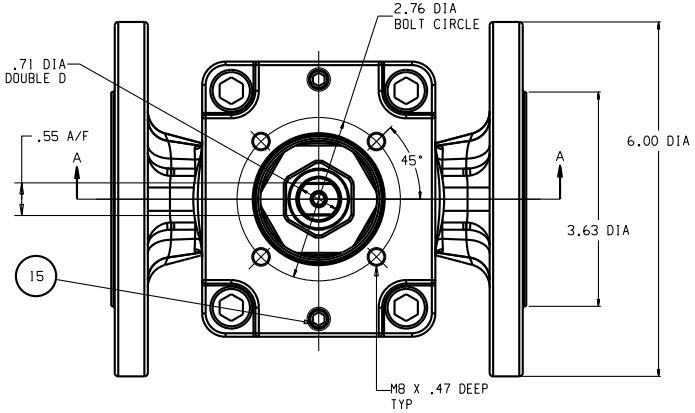
Matthew J. Wasielewski, PE
President and Manager
Yarmouth Research & Technology, LLC

YARMOUTH RESEARCH AND TECHNOLOGY, LLC

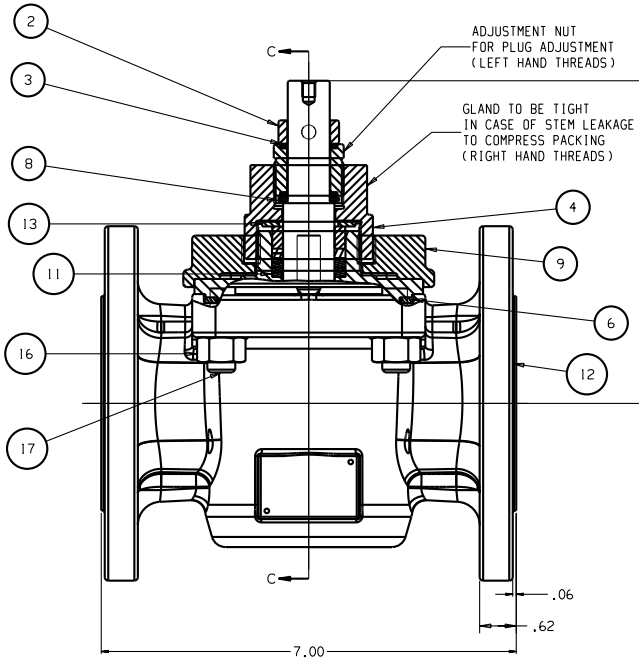
Fire Test Information Sheet

Fire Test Specification and Revision: (ie. API 607 8th, API 6FA 5th, etc)	API 607 8th Annex A (External Leakage)
Yarmouth Proposal Number:	222341A
Customer Purchase Order Number:	PO114354
Customer's Contact Name:	Rick Walker Jr.
Customer's Name (used in test report as specified):	Crane ChemPharma Flow Solutions
Company Web Address to be listed on report cover:	www.cranecpe.com
Valve Manufacturer's Address:	4444 Cooper Rd. Cincinnati, Ohio 45242
Did valve meet all required hydrostatic, leakage and other production pressure tests?	Yes
Valve Description for Report Cover:	2" L067FT Class 150 Plug Valve
Valve Product Code:	SPV-L00037
Valve Description	
Size:	2"
Pressure Rating/Class:	150
Pressure Rating at 100F:	285 PSI
Type:	Plug Valve
Weight:	45 Lbs.
Reduced or Full Bore:	Reduced
Body/Bonnet Material:	SS316
Trim Material:	SS316
Seat Material:	PFA
Stem Seal Material:	Graphite
Body Seal Material:	SS316/GRAPHITE
Bolting Material:	ASTM A193 GRADE B8 CLASS 2
Is valve considered "Soft-Seated"?	Yes
If valve is fitted with gearbox, state gearbox manufacturer, model # and mech. advantage:	Mastergear M10 gear / 12" handwheel Mechanical Advantage 11.0
State if valve is symmetric or non-symmetric: If non, state direction of flow for test:	NON-SYMMETRIC PLUG VENT HOLE UP STREAM
IMPORTANT - Cavity pressure tap is required for ALL dual-seated valves. Please refer to quote	
For double-seated valves, state maximum allowable cavity pressure:	430 PSI
Should testing be performed for external leakage only per API 607, 8th ed, Annex A?	Yes
Pre-Test Adjustments, if any:	N/A
Valve Markings	
Nameplate Information:	N/A
Casting Markings:	L-TORQ, XOMOX, 2", 150, CF8M/1.4408
Assembly Drawing Number / Revision / Date:	NP221101 REV. 00 & NP221102 REV. 00
Emailed (PDF) to Yarmouth: Date:	11/9/2022
Form Submission Date:	11/9/2022

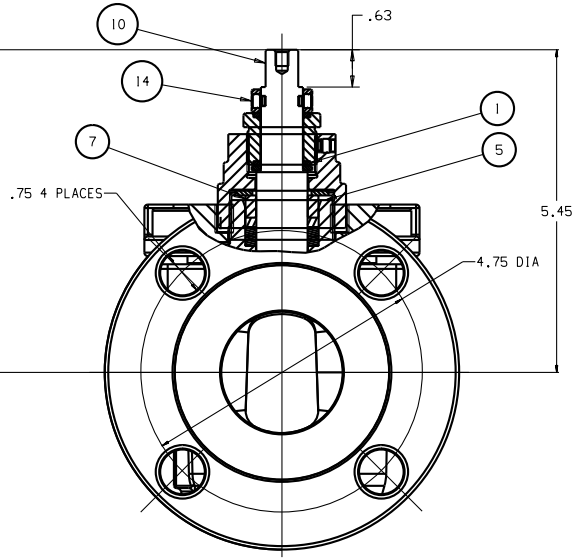
NP221102



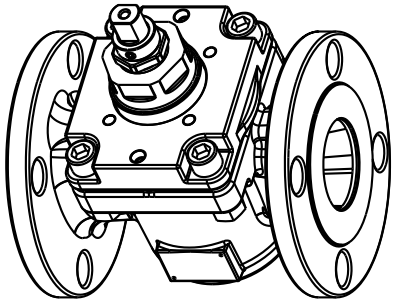
BILL OF MATERIALS			
POS	QTY	PART NAME	MATERIAL
1	2	SOFT WASHER	COPPER-NICKEL ALUMINIUM
2	1	COLLAR	SS321
3	1	ADJUSTMENT NUT	SS2205
4	1	GLAND	SS316
5	1	CAGE	SS316 LINED WITH PFA
6	1	COVER-GASKET	SS316/GRAPHITE
7	1	FOLLOWER	SS316
8	1	HARD WASHER	17-4 PH
9	1	COVER	SS316
10	1	PLUG	SS316
11	3	PACKING	GRAPHITE
12	1	BODY	SS316
13	1	SPRING WASHER	17-7 PH
14	3	M6X6 DOG POINT SCREW	SS316
15	2	M10X20 JACKING SCREW	SS316
16	4	1/2-13 COVER NUT	ASTM A194, GRADE 8 CLASS 2
17	4	1/2-13 X 2" COVER BOLT	ASTM A193, GRADE B8 CLASS 2



SECTION A-A



SECTION C-C



SCALE 0.750

REV	ECO-	DESCRIPTION	BY / DATE	CHK / DATE	APP / DATE

ALL DIMENSIONS IN INCHES

TOLERANCES, UNLESS OTHERWISE SPECIFIED :
.XX ±.03
.XXX ±.010
ANGULAR ±0°30'

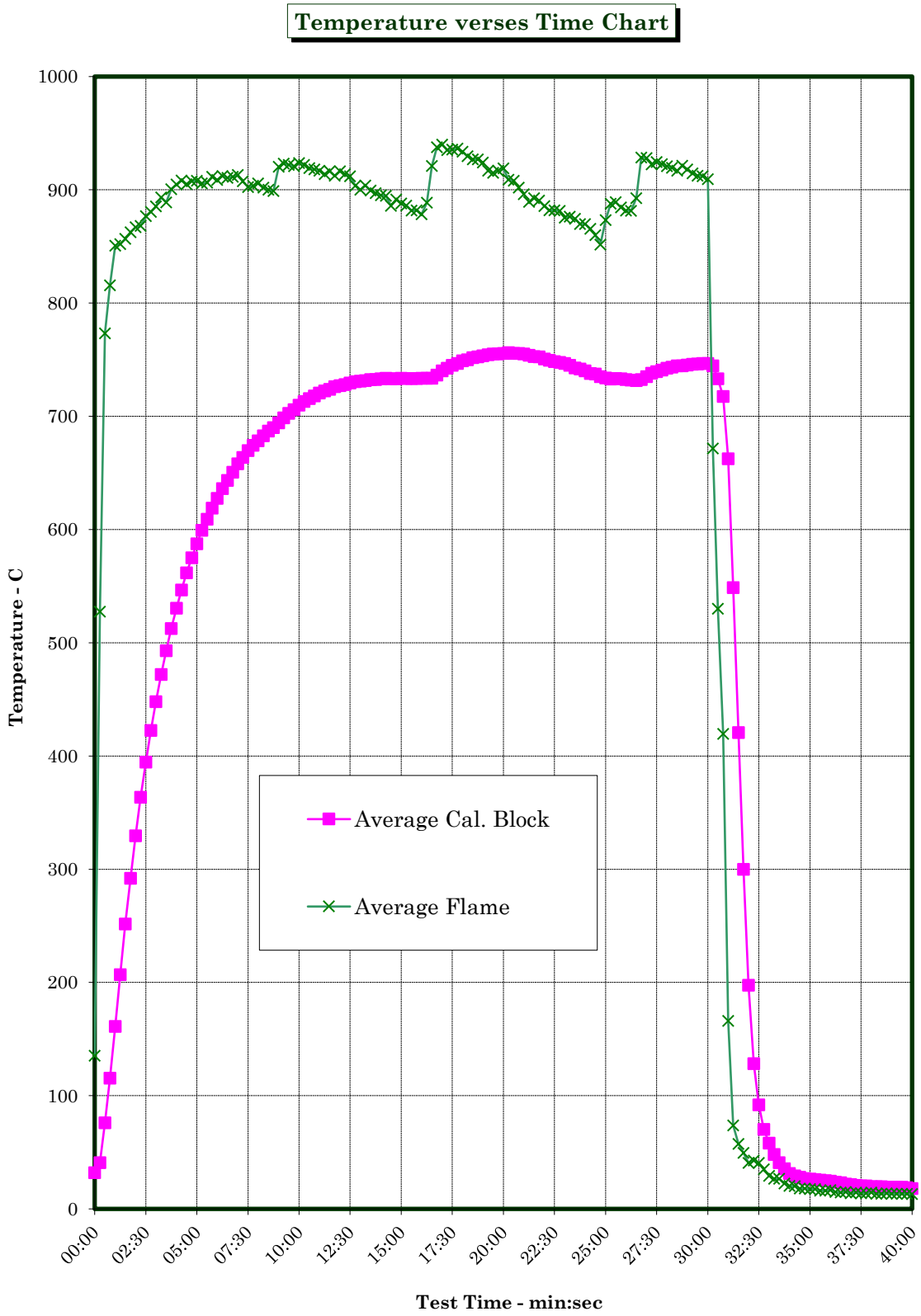
DO NOT SCALE DRAWING

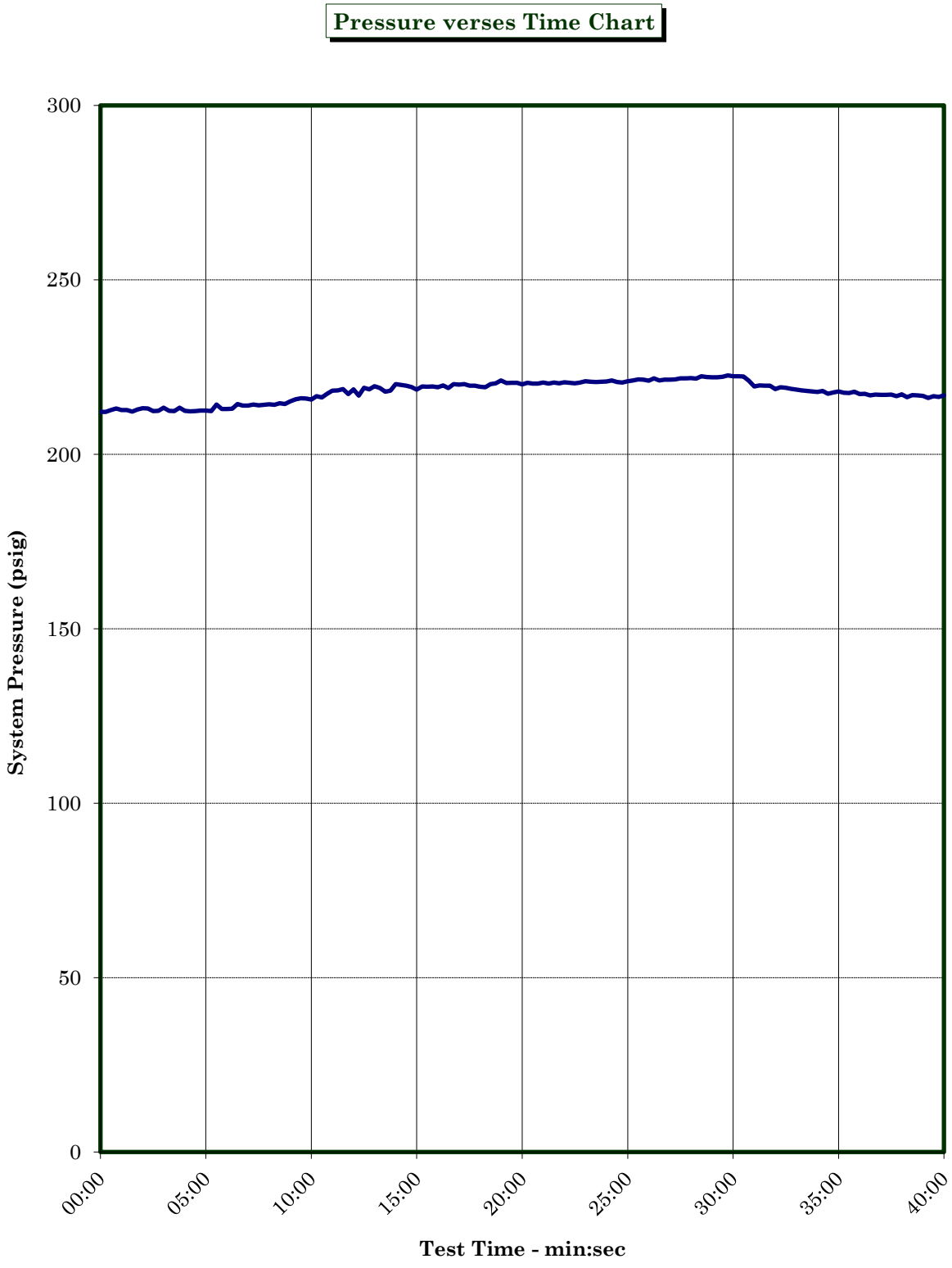
XOMOX® TURLINE® CRANE CHEMPHARMA FLOW SOLUTIONS
4444 COOPER ROAD
CINCINNATI, OHIO 45242

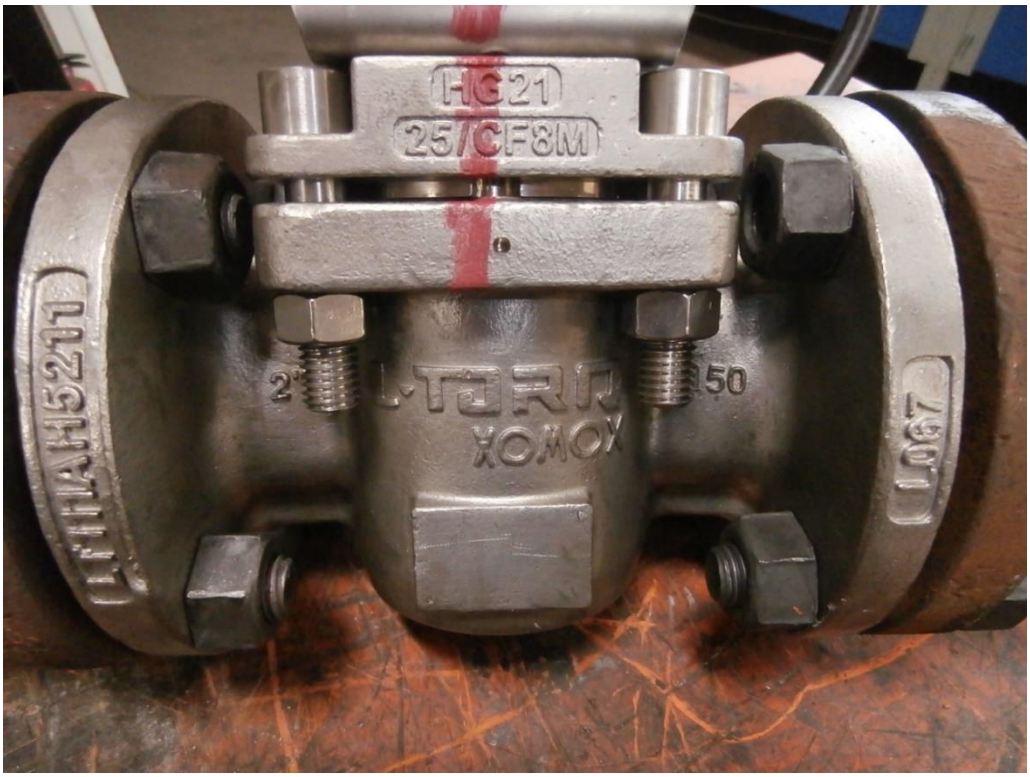
		SIZE	CLASS	FIGURE NO.	SCALE
DWN	REW 11/7/22	2"	150	L067FT	1.000
CHK	TJC 11/8/22				
APP	SK 11/8/22				
REL					

2" L067FT CLASS 150 FIRE TEST ASSEMBLY

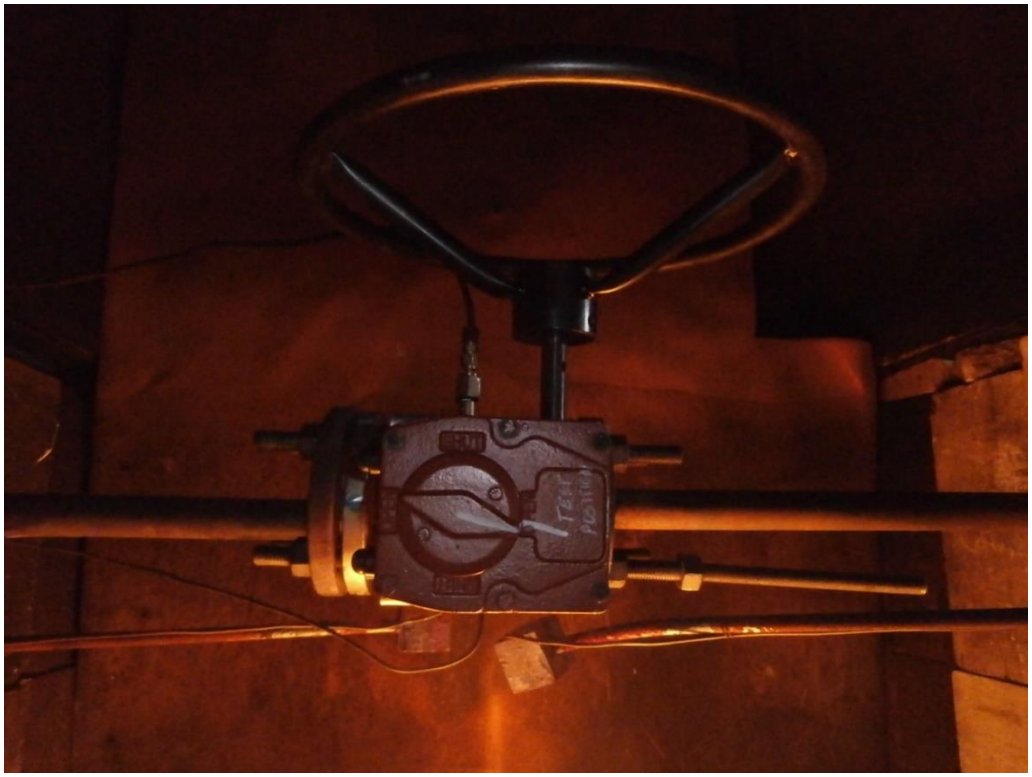
CRANE | SIZE D | DWG NO. NP221102 | REV. 00


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


Pressure verses Time Chart
300
250
200
150
100
50
0
System 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: Crane ChemPharma Flow Solutions **Date:** 11/28/2022

Product Code: 2" L067FT Class 150 Plug Valve

Project Number: 222341

Fire Test Raw Data

Time	Pressure (psig)	Water Volume (mls)	Bonnet Temp-C	Body Temp-C	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
10:22:00	212	27584	59	44	33	31	32	128	143	135
10:22:15	212	28457	215	186	43	39	41	497	558	528
10:22:30	213	28350	343	308	81	71	76	753	794	773
10:22:45	213	27897	387	344	119	112	116	792	839	816
10:23:00	213	27819	417	356	162	160	161	852	849	851
10:23:15	213	27955	438	370	206	208	207	853	851	852
10:23:30	212	28067	452	374	247	256	252	862	851	857
10:23:45	213	28256	463	410	285	299	292	873	852	863
10:24:00	213	27835	474	418	321	338	329	876	858	867
10:24:15	213	27932	485	424	355	372	364	877	859	868
10:24:30	212	27999	497	420	386	403	394	881	872	877
10:24:45	212	28259	507	447	414	431	423	887	874	881
10:25:00	213	27702	517	455	440	456	448	888	883	885
10:25:15	212	27996	527	473	464	480	472	888	899	893
10:25:30	212	27781	538	483	485	501	493	875	903	889
10:25:45	213	27690	548	489	504	521	513	885	916	901
10:26:00	212	27690	556	492	522	539	531	882	927	905
10:26:15	212	27656	564	493	537	556	547	883	934	908
10:26:30	212	28314	568	495	551	572	562	873	937	905
10:26:45	213	28342	577	493	564	586	575	878	937	908
10:27:00	213	27897	583	497	576	599	588	875	941	908
10:27:15	212	28088	591	499	587	611	599	869	942	906
10:27:30	214	27888	596	516	596	622	609	869	944	906
10:27:45	213	28124	602	518	605	633	619	878	945	911
10:28:00	213	28057	608	526	613	642	628	871	946	909
10:28:15	213	28063	614	525	621	651	636	877	947	912
10:28:30	214	27958	619	531	628	659	643	866	955	911
10:28:45	214	27830	622	533	635	666	651	869	954	911
10:29:00	214	28174	625	538	642	674	658	872	954	913
10:29:15	214	28108	629	544	647	680	664	862	953	908
10:29:30	214	28222	631	549	652	687	670	846	959	903
10:29:45	214	28207	637	553	656	693	674	850	957	904
10:30:00	214	28219	639	551	659	698	678	850	961	906

Fire Test Data - continued

10:30:15	214	28229	640	548	663	703	683	843	961	902
10:30:30	215	28344	644	553	666	708	687	840	960	900
10:30:45	214	28174	645	554	668	712	690	838	960	899
10:31:00	215	28318	654	557	671	717	694	873	968	920
10:31:15	216	28535	659	553	676	721	699	880	966	923
10:31:30	216	28529	662	554	680	725	703	878	966	922
10:31:45	216	28285	666	559	684	728	706	873	969	921
10:32:00	216	28012	667	570	687	732	710	877	970	924
10:32:15	217	28529	669	572	691	735	713	878	966	922
10:32:30	216	28332	672	579	694	737	716	872	966	919
10:32:45	217	28550	674	587	697	739	718	870	966	918
10:33:00	218	28581	676	595	699	742	721	869	965	917
10:33:15	218	28602	675	594	701	744	723	865	963	914
10:33:30	219	28826	676	598	703	745	724	868	965	916
10:33:45	217	28465	678	601	705	747	726	869	956	913
10:34:00	219	29130	682	604	706	748	727	875	958	916
10:34:15	217	28194	683	609	707	749	728	865	963	914
10:34:30	219	29360	684	614	708	751	729	860	964	912
10:34:45	219	27976	684	609	709	752	731	866	941	904
10:35:00	220	29144	685	604	710	752	731	853	947	900
10:35:15	219	29142	684	606	710	753	731	865	943	904
10:35:30	218	28919	685	609	711	754	733	850	949	899
10:35:45	218	28155	687	611	711	754	733	836	958	897
10:36:00	220	28998	687	612	711	755	733	843	948	895
10:36:15	220	29120	690	612	711	756	734	852	937	895
10:36:30	220	29038	690	606	710	756	733	838	934	886
10:36:45	219	28646	690	611	710	756	733	840	943	891
10:37:00	219	28219	691	611	710	757	734	837	939	888
10:37:15	219	28498	687	614	709	758	733	820	952	886
10:37:30	219	28767	691	610	708	759	733	831	932	882
10:37:45	219	28816	691	611	708	759	733	826	938	882
10:38:00	219	28873	695	605	707	760	734	824	933	878
10:38:15	220	28940	695	612	707	760	734	832	945	889
10:38:30	219	28479	704	640	707	760	734	876	966	921
10:38:45	220	28808	710	641	710	763	736	907	968	938
10:39:00	220	29066	712	645	714	766	740	910	970	940
10:39:15	220	28992	715	641	717	768	743	905	965	935
10:39:30	220	28795	715	646	719	771	745	902	969	936
10:39:45	220	28563	719	640	721	772	747	910	963	936
10:40:00	219	28606	721	641	724	774	749	901	966	934
10:40:15	219	28658	720	643	725	775	750	892	967	930
10:40:30	220	28970	723	648	726	777	752	886	968	927
10:40:45	220	29089	725	651	727	778	753	891	963	927

Fire Test Data - continued

10:41:00	221	28743	726	649	728	779	753	886	962	924
10:41:15	220	28962	727	649	729	780	754	884	950	917
10:41:30	220	28871	729	647	730	780	755	889	941	915
10:41:45	220	29001	728	644	730	780	755	890	944	917
10:42:00	220	28713	728	642	731	780	756	889	949	919
10:42:15	220	28773	728	644	732	780	756	868	950	909
10:42:30	220	28820	727	642	731	780	756	862	954	908
10:42:45	220	28761	728	641	731	780	756	855	949	902
10:43:00	221	28757	729	643	730	780	755	840	952	896
10:43:15	220	28724	729	641	729	779	754	838	941	889
10:43:30	221	28764	727	642	728	778	753	840	945	893
10:43:45	220	28811	728	642	727	778	753	840	941	891
10:44:00	221	28785	731	639	725	776	751	836	935	886
10:44:15	221	28827	731	641	724	775	749	831	933	882
10:44:30	220	28697	731	638	723	774	748	830	934	882
10:44:45	221	28708	733	639	722	773	748	830	933	881
10:45:00	221	28774	735	630	721	772	747	833	918	875
10:45:15	221	28808	735	631	720	770	745	824	929	876
10:45:30	221	28725	734	628	718	768	743	831	918	874
10:45:45	221	28783	733	632	717	766	742	802	937	870
10:46:00	221	28827	737	635	715	765	740	807	932	870
10:46:15	221	28745	735	624	713	763	738	824	907	866
10:46:30	221	28711	736	627	712	762	737	803	917	860
10:46:45	221	28827	734	626	710	760	735	796	907	852
10:47:00	221	28736	737	624	709	759	734	838	909	873
10:47:15	221	28739	741	634	708	758	733	843	933	888
10:47:30	221	28699	743	639	709	758	733	851	927	889
10:47:45	221	28660	744	633	709	757	733	846	923	884
10:48:00	221	28686	744	629	710	755	733	852	911	882
10:48:15	222	28651	743	632	710	754	732	848	915	881
10:48:30	221	28766	747	629	710	753	731	872	913	893
10:48:45	221	28795	755	651	712	753	733	915	942	929
10:49:00	221	28807	757	651	716	754	735	929	927	928
10:49:15	221	28807	760	646	721	755	738	936	909	923
10:49:30	222	28747	761	651	725	754	739	924	925	924
10:49:45	222	28885	763	647	728	754	741	923	923	923
10:50:00	222	28951	763	648	731	754	743	919	923	921
10:50:15	222	28830	764	649	733	754	743	914	925	919
10:50:30	222	28574	764	645	735	754	744	921	913	917
10:50:45	222	28833	767	651	736	753	744	913	930	921
10:51:00	222	28745	768	655	738	753	745	910	926	918
10:51:15	222	28907	768	652	739	753	746	913	916	914
10:51:30	222	28750	771	648	740	752	746	911	914	913

Fire Test Data - continued

10:51:45	223	28517	772	646	741	752	747	909	915	912
10:52:00	222	28817	773	648	742	751	747	896	923	909
10:52:15	222	28796	688	568	741	748	744	662	681	672
10:52:30	222	28774	628	506	731	735	733	513	547	530
10:52:45	221	28503	594	474	717	718	718	389	450	419
10:53:00	219	28558	534	456	661	664	663	82	250	166
10:53:15	220	28521	496	435	525	572	549	61	86	74
10:53:30	220	28621	458	141	372	469	421	47	68	58
10:53:45	220	28449	428	132	238	362	300	41	58	49
10:54:00	219	28252	408	128	140	255	198	41	40	41
10:54:15	219	28426	402	127	88	169	128	43	43	43
10:54:30	219	28298	391	122	66	118	92	40	41	41
10:54:45	219	28314	375	131	53	88	70	33	37	35
10:55:00	219	28323	364	125	46	70	58	26	32	29
10:55:15	218	28574	344	121	39	57	48	22	31	27
10:55:30	218	28115	324	121	34	48	41	21	32	27
10:55:45	218	28253	308	114	30	41	36	20	25	23
10:56:00	218	28306	233	110	28	35	31	18	23	20
10:56:15	218	28250	113	105	26	32	29	18	22	20
10:56:30	217	28320	99	102	27	29	28	17	19	18
10:56:45	218	28191	97	99	28	26	27	17	19	18
10:57:00	218	28112	92	93	28	25	26	16	19	18
10:57:15	218	28196	88	91	29	23	26	16	19	18
10:57:30	218	28124	83	90	29	22	26	15	17	16
10:57:45	218	28094	76	90	29	21	25	15	17	16
10:58:00	217	28201	71	88	28	21	24	16	17	17
10:58:15	217	28163	65	85	27	20	24	14	16	15
10:58:30	217	28074	61	81	26	20	23	13	16	14
10:58:45	217	28118	59	77	25	19	22	15	15	15
10:59:00	217	28097	55	73	25	18	21	13	15	14
10:59:15	217	28032	53	69	24	18	21	14	15	14
10:59:30	217	28172	50	66	23	18	20	13	15	14
10:59:45	217	28196	47	63	23	18	20	13	15	14
11:00:00	217	28010	46	60	22	17	20	14	15	14
11:00:15	216	28170	43	58	22	17	20	13	14	13
11:00:30	217	28078	42	55	22	17	20	13	14	13
11:00:45	217	28002	40	53	21	17	19	13	15	14
11:01:00	217	28106	39	50	21	17	19	13	14	13
11:01:15	216	28141	38	48	21	17	19	13	14	13
11:01:30	217	28047	38	47	21	17	19	13	14	13
11:01:45	216	28056	37	45	20	17	19	13	14	13
11:02:00	217	27893	36	43	20	16	18	12	14	13

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 Water Volume Lost Over 40 Minute Burn and Cool Down:	-309	mls
Water Collected in System Relief Valve:	0	mls
Calculated External Leakage During 40 Minute Duration:	-309	mls
Average Leak Rate Over 40 Minute Duration:	0	ml/min
Allowable 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:	223	psig
Average Pressure During Burn/Cool Down:	218	psig
Minimum Pressure During Burn/Cool Down:	212	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:	756	deg. C
Average Cal Block Temperature:	529	deg. C
Lowest Avg Cal. Block Temperature:	18.1	deg. C
Maximum Body Flame Temperature During Burn:	970	deg. C
Average Body Flame Temperature During Burn:	926	deg. C
Maximum Bonnet Flame Temperature During Burn:	936	deg. C
Average Bonnet Flame Temperature During Burn:	858	deg. C
Average of Both Flame Temperatures During Burn:	892	deg. C

Notes

Were Test Conditions Within Compliance?	**Yes**

Yarmouth Research and Technology, LLC

Operational Test Information

Customer: Crane ChemPharma Flow Solutions **Date:** 11/28/2022

Product Code: 2" L067FT Class 150 Plug Valve

Project Number: 222341

Test Data

Time	Pressure (psig)	Cal Block Temp - C
11:07:59	216	19
11:08:14	216	19
11:08:29	216	19
11:08:44	216	19
11:08:59	216	19
11:09:14	216	19
11:09:29	216	19
11:09:44	216	19
11:09:59	216	19
11:10:14	216	19
11:10:29	216	19
11:10:44	216	19
11:10:59	216	19
11:11:14	217	19
11:11:29	216	19
11:11:44	215	19
11:11:59	216	19
11:12:14	216	19
11:12:29	216	19
11:12:44	216	19
11:12:59	216	19

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**

Yarmouth Research and Technology, LLC

ANSI/API Standard 607 Eighth Edition - 2022
Modified for External Leakage Only
Fire Test Certificate

Certificate Number:	222341A	***Test Start Date:***	11/28/2022

Customer Information	
Customer:	Crane ChemPharma Flow Solutions
Web Address:	www.cranecpe.com

Valve Information			
Valve Description:	2" L067FT Class 150 Plug Valve		
Product Code:	SPV-L00037		
Body/Bonnet Material:	SS316		
Seat Material:	PFA	Valve Size:	2"
Stem Seal Material:	Graphite	ANSI Pressure Class:	150
Body Seal Material:	SS316/GRAPHITE		
Body/Bonnet Bolting:	ASTM A193 GRADE B8 CLASS 2		

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

Test Results

The above mentioned product is certified to have successfully completed the test requirements of the test standard(s) listed, with leakages below the allowables. This certificate does not imply assessment of the production of the product.

Other Valve Qualifications

Valves of the same construction may also be qualified according to the applicable section of the test standard.

Certified By

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