Fire Test Report

API Standard 6FA, Third Edition, April 1999
"Specification for Fire Testing of Valves"

Performed for

EV Metalvaerk A/S

www.evmetal.dk

1 inch Class 150
Monoflange Instrument Valve SDBB
Product Code: 10#150 1 RFxNPT

Project Number: 215374
Test Date: January 13, 2016

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: EV Metalværk A/S	**Date:** 1/13/2016
Specification: API Standard 6FA, Third Edition, April 1999 (R2008)	
Product Description: 1 inch Class 150 Monoflange Instrument Valve SDBB	
Project Number: 215374	
Product Code: 10# 150 1 RFxNPT	

Equipment Confirmed to be in Calibration to NIST Standards: Yes

Burn and Cool Down Test

Burn Start Time:	13:59:00	
Average Pressure During Burn:	210	psig
Seat Leak Rate During Burn:	0	ml/min
Allowable Seat Leak Rate:	400	ml/min
External Leak Rate During Burn/Cool Down:	0.8	ml/min
Allowable External Leak Rate:	100	ml/min
Amount of Time of Avg. Cal. Blocks > 650 deg. C:	22.3	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:	209	psig
External Leak Rate After Operating:	0	ml/min
Allowable External Leak Rate:	200	ml/min
Was the Leakage Below the Allowable?	Yes	
Does Valve Pass or Fail the Test Standard?	**PASS**	

Certified By:

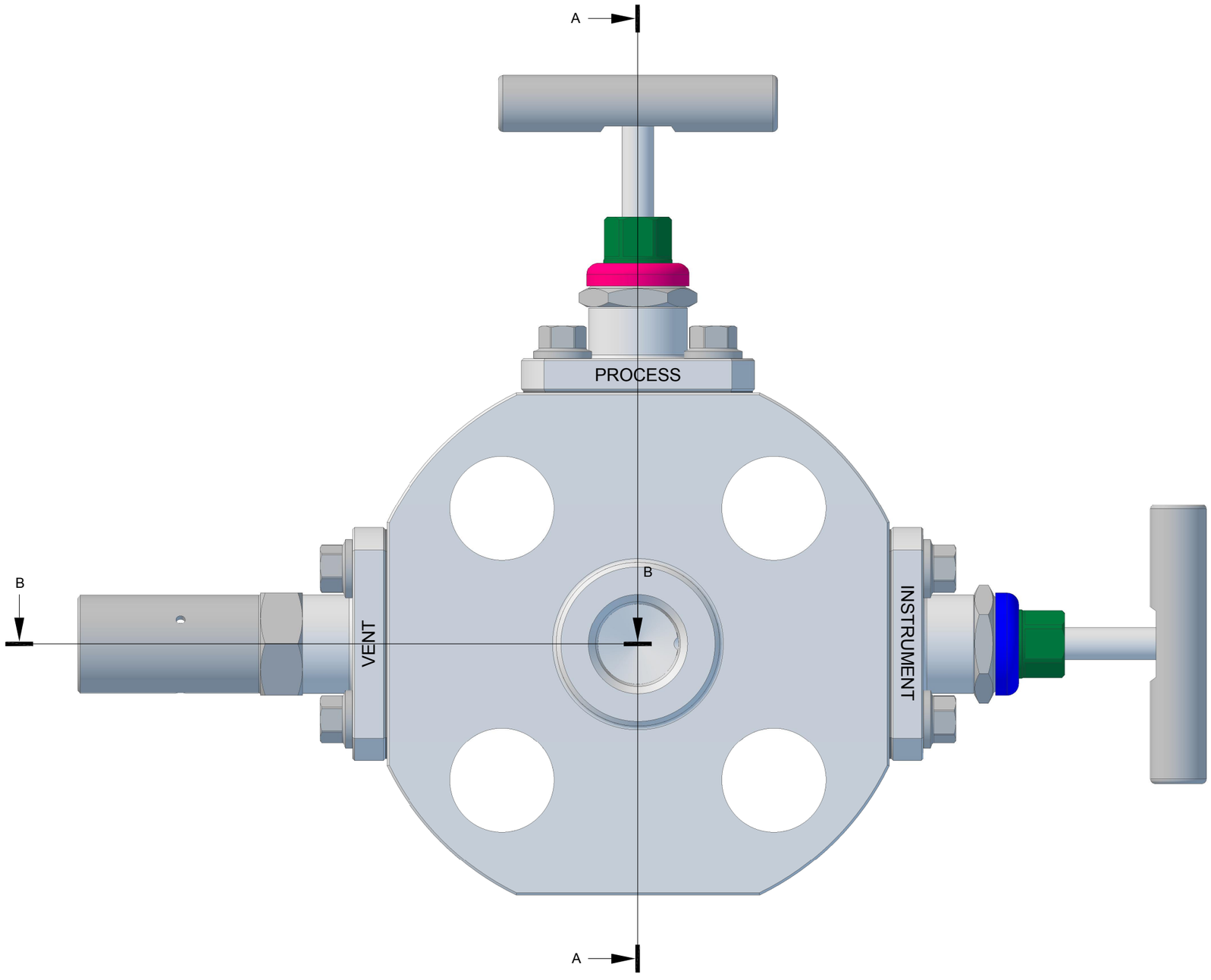
Matthew Wasielewski, PE
President and Manager
Yarmouth Research and Technology, LLC

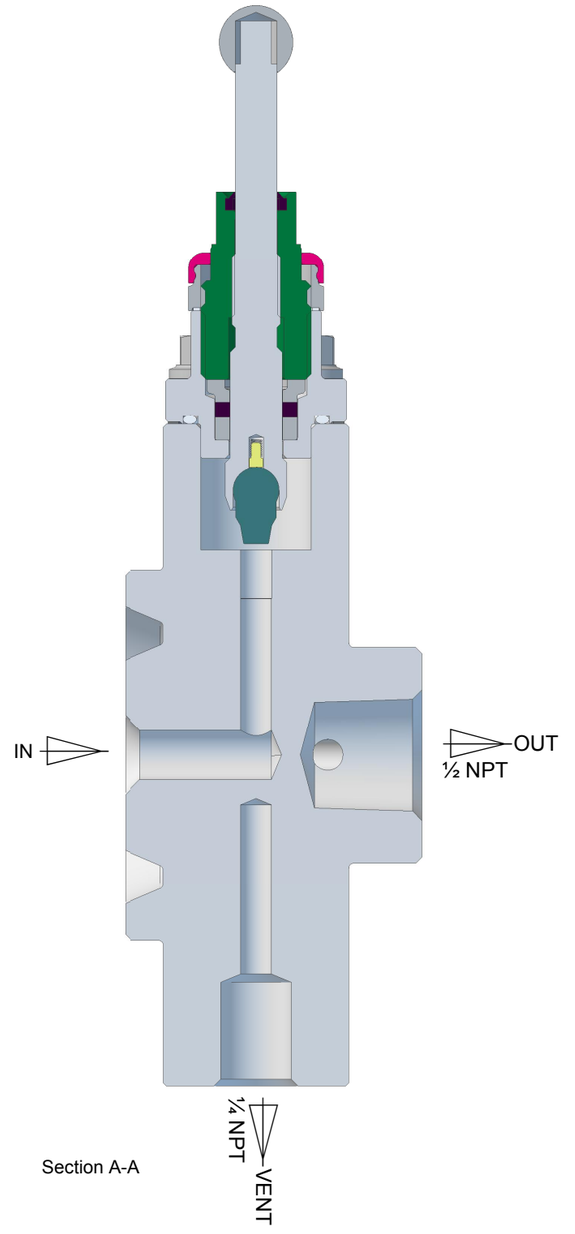
YARMOUTH RESEARCH AND TECHNOLOGY, LLC

Fire Test Information Sheet

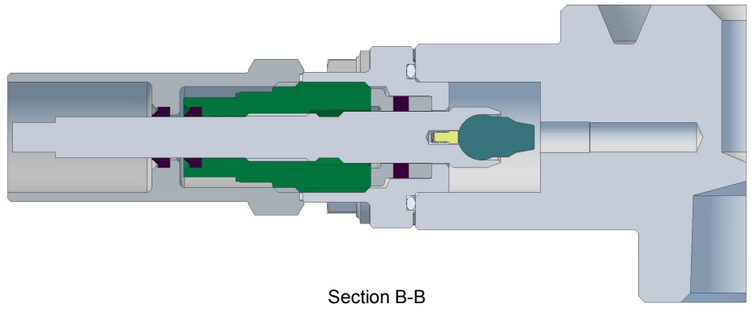
Fire Test Specification and Revision: (ie. API 607 6th, API 6FA 3rd, etc)	API 6FA 3rd.
Yarmouth Proposal Number:	215374A
Customer Purchase Order Number:	5028401
Customer's Contact Name:	Erling Tofting
Valve Manufacturer's Name (used in test report as specified):	EV Metalværk A/S
Company Web Address for Report Cover:	www.evmetal.dk
Valve Manufacturer's Address:	Ribovej 1, 6950 Ringkobing, Denmark
Did valve meet all required hydrostatic, leakage and other production pressure tests?	Yes
Valve Description for Report Cover:	Monoflange instrument valve SDBB
Valve Product Code:	10#150 1 RFxNPT
Valve Description	
Size:	1"
Pressure Rating/Class:	# 150
Pressure Rating at 100F (psig):	275 psig
Type:	SDBB valve
Weight:	
Reduced or Full Bore:	Needle valve
Body/Bonnet Material:	EN 1.4404
Trim Material:	NA
Seat Material:	EN 1.4404
Stem Seal Material:	PCTFE
Body Seal Material:	PTFE
Bolting Material:	EN 1.4410
Is valve considered "Soft-Seated"?	No
Valve Markings	
Nameplate Information:	Se enclosed drawing
Casting Markings:	NA
Assembly Drawing Number / Revision / Date of Issue:	Se enclosed drawing.
Emailed (PDF) to Yarmouth: Date:	
If valve is fitted with gearbox, state gearbox manufacturer, model number and mechanical advantage:	No gearbox
If valve is non-symmetric, state direction of flow for test:	See marking drawing
For double-seated valves, state maximum allowable cavity pressure:	NA
Form Submission Date:	22-12-2015

PLEASE RETURN AS AN EXCEL DOCUMENT





Section A-A

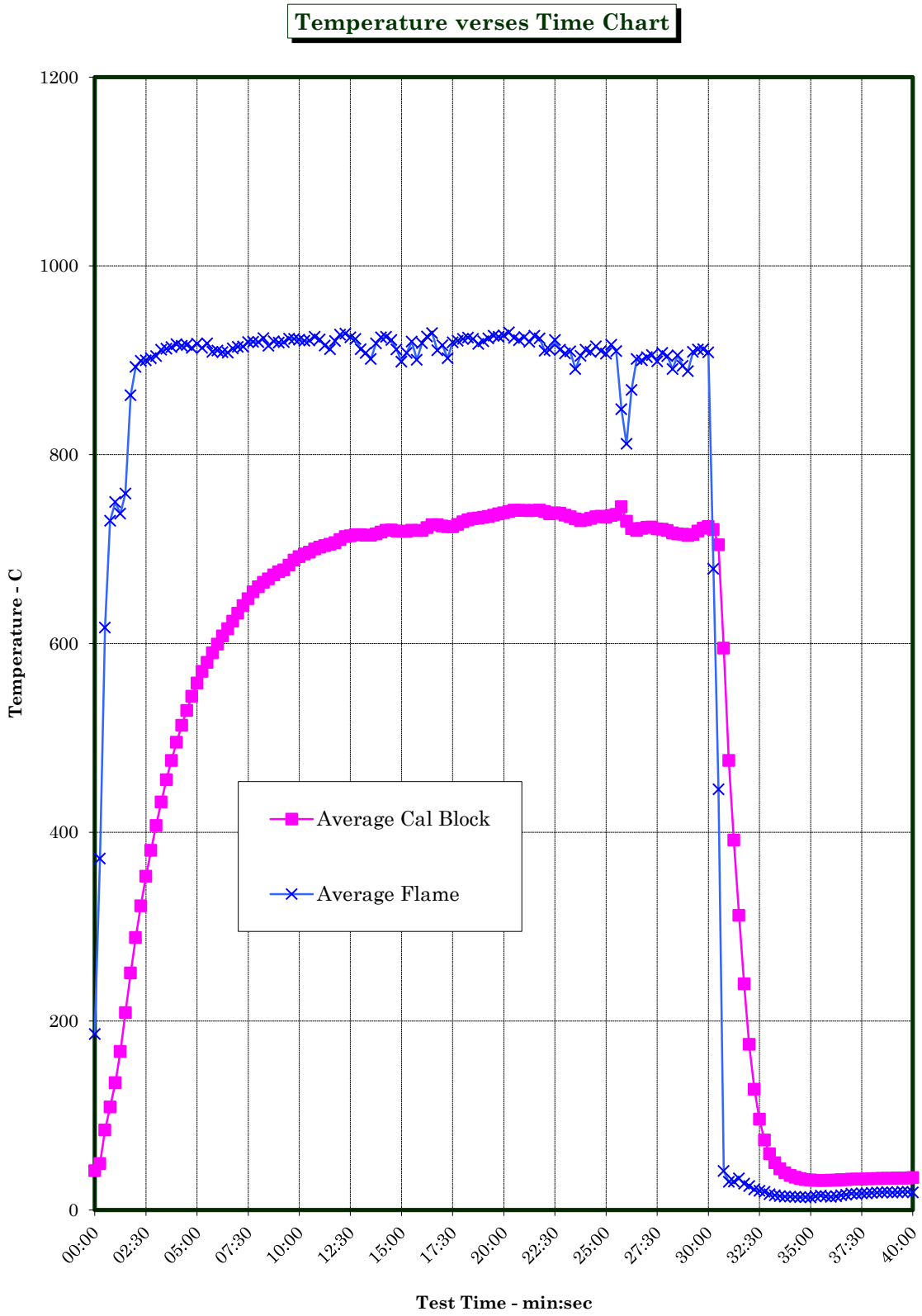


Section B-B

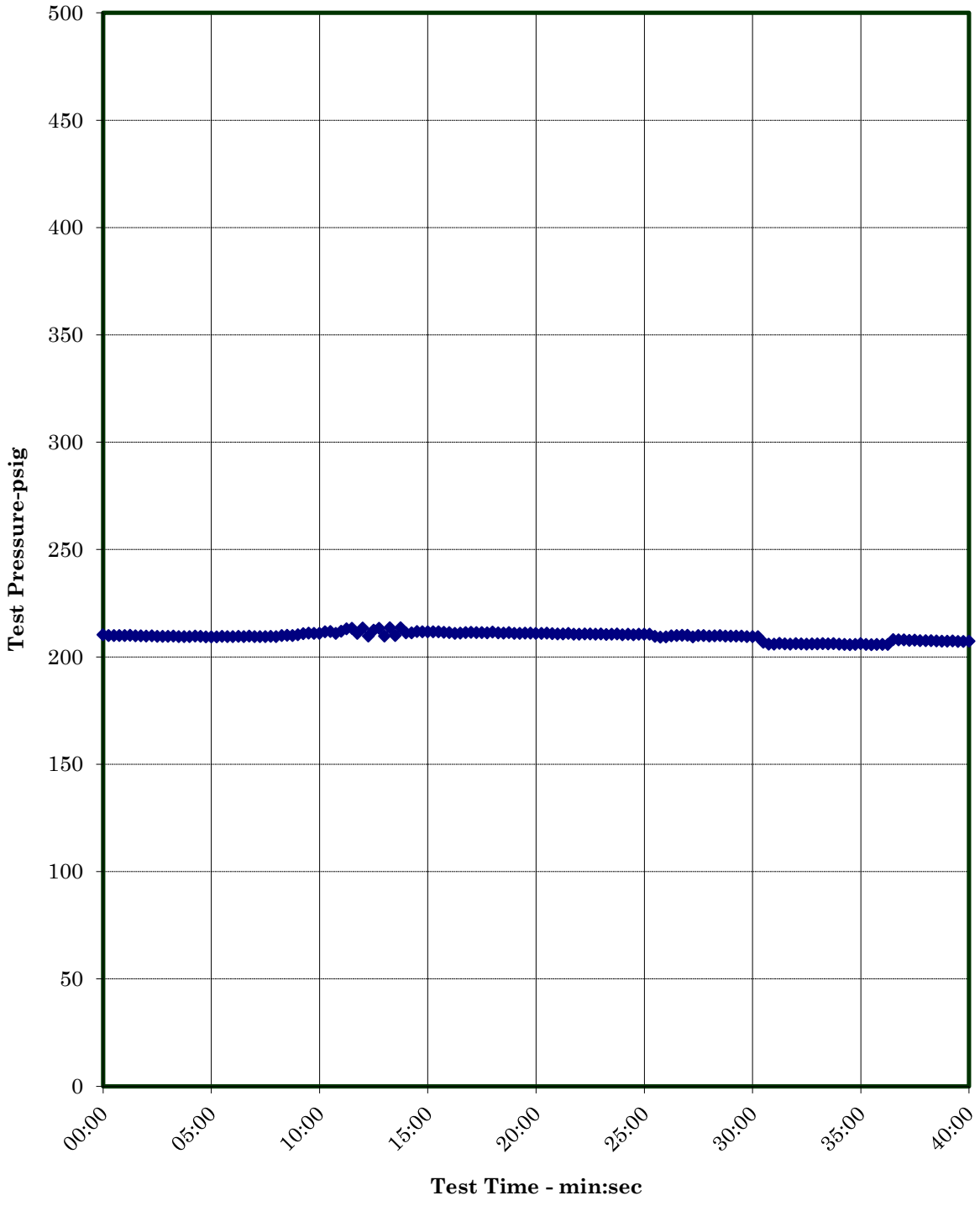
EV METALVÆRK A/S
RIBOVEJ 1
DK-6950 RINGKØBING

Scale	Date	Drawn by	Material
1:1	19.01.15	NBJ	
A3	Post treatment	Weight	Dim.
	Edges deburred. Dimensions without tolerance ±0.1 mm		
Designation: Slimline Block & Bleed valve		Dwg. no.	

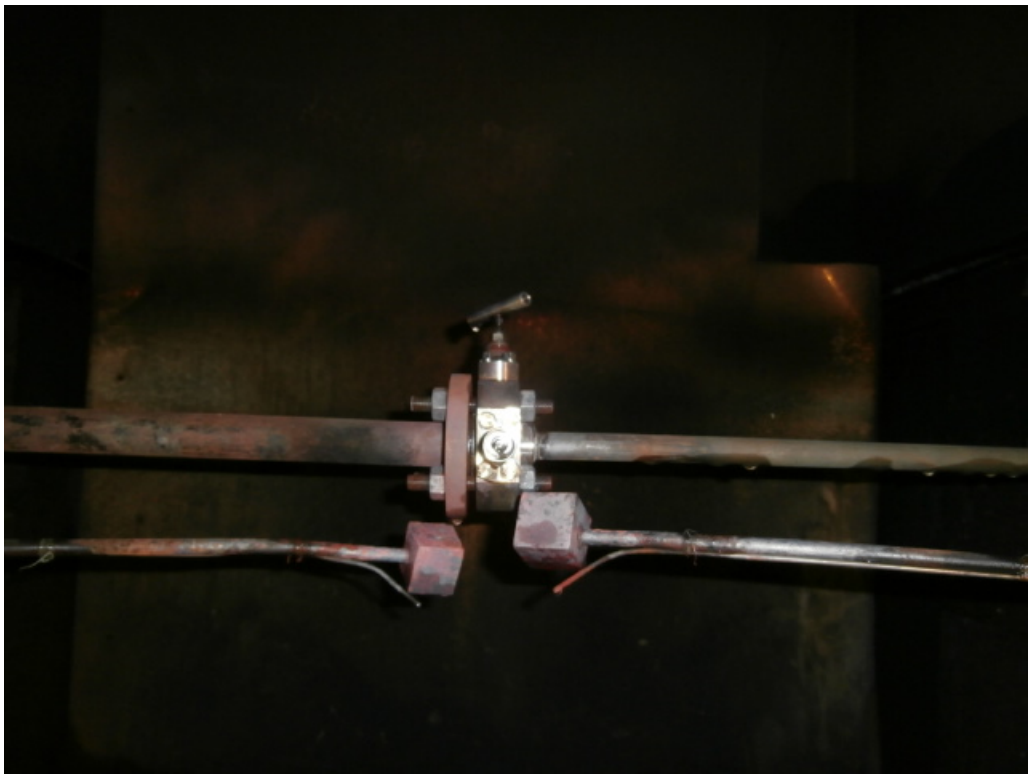
Confidential: Property of EV METALVÆRK A/S. Not to be handed over to, copied or used by third party.
2D/3D reproduction of contents to be authorized by EV METALVÆRK A/S.


Temperature verses Time Chart
1200
1000
800
600
400
200
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



Valve Markings



Test Setup Prior to Burn

Test Valve During Burn

Fire Test Information

Customer: EV Metalværk A/S **Date:** 1/13/2016

Product Code: 1 inch Class 150 Monoflange Instrument Valve SDBB

Project Number: 215374

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
13:59:00	210	41060	42	42	42	174	199	186
13:59:15	210	41086	51	47	49	367	377	372
13:59:30	210	40999	104	66	85	624	610	617
13:59:45	210	41134	120	98	109	767	693	730
14:00:00	210	41065	149	121	135	738	761	750
14:00:15	210	41071	194	142	168	708	767	738
14:00:30	210	41112	242	176	209	736	782	759
14:00:45	210	41073	288	214	251	866	861	863
14:01:00	210	41079	321	256	288	909	877	893
14:01:15	210	41086	347	297	322	920	879	899
14:01:30	210	41060	372	335	353	922	878	900
14:01:45	210	41071	394	368	381	927	878	902
14:02:00	210	41096	417	398	407	938	871	904
14:02:15	210	41110	440	424	432	945	877	911
14:02:30	209	41065	462	449	456	948	877	912
14:02:45	209	41060	481	472	476	945	883	914
14:03:00	209	41044	498	493	495	946	888	917
14:03:15	210	41088	515	512	513	948	882	915
14:03:30	210	41059	529	529	529	947	886	916
14:03:45	209	41137	544	544	544	945	881	913
14:04:00	209	41059	557	559	558	952	883	918
14:04:15	209	41132	567	573	570	941	885	913
14:04:30	210	41080	574	586	580	949	886	918
14:04:45	209	41071	582	598	590	944	873	909
14:05:00	209	41092	589	609	599	945	876	910
14:05:15	210	41047	596	620	608	937	881	909
14:05:30	209	41110	601	630	616	939	877	908
14:05:45	210	41127	608	639	624	946	879	913
14:06:00	209	41139	616	648	632	937	892	914
14:06:15	209	41105	624	656	640	938	891	914
14:06:30	209	41116	632	663	648	952	887	919
14:06:45	210	41155	640	669	655	952	887	919
14:07:00	209	41148	645	675	660	950	888	919

Fire Test Data - continued

14:07:15	210	41215	649	681	665	954	892	923
14:07:30	210	41181	651	686	668	948	882	915
14:07:45	210	41308	654	691	673	944	896	920
14:08:00	210	41118	657	695	676	947	891	919
14:08:15	211	41220	657	699	678	947	891	919
14:08:30	211	41470	663	703	683	951	895	923
14:08:45	211	41441	670	707	688	955	890	923
14:09:00	211	41440	674	710	692	951	893	922
14:09:15	212	41456	677	713	695	946	895	921
14:09:30	212	41279	678	716	697	947	895	921
14:09:45	211	40467	682	718	700	953	896	925
14:10:00	212	42674	683	721	702	956	888	922
14:10:15	213	42236	683	724	704	951	881	916
14:10:30	213	42179	683	727	705	952	872	912
14:10:45	211	42129	684	729	707	957	884	920
14:11:00	213	41962	688	732	710	959	894	927
14:11:15	210	40159	693	733	713	962	894	928
14:11:30	212	42990	693	734	714	955	893	924
14:11:45	213	41817	694	736	715	956	889	923
14:12:00	210	40425	692	738	715	952	872	912
14:12:15	214	42846	689	739	714	956	859	908
14:12:30	210	40741	688	741	714	952	851	901
14:12:45	214	42790	689	742	716	953	883	918
14:13:00	211	42092	693	743	718	956	892	924
14:13:15	211	41958	696	744	720	955	894	925
14:13:30	212	41678	696	745	720	951	892	921
14:13:45	212	41673	693	745	719	945	878	911
14:14:00	212	41638	692	746	719	941	857	899
14:14:15	212	41642	691	747	719	948	867	908
14:14:30	212	41627	692	748	720	952	888	920
14:14:45	211	41609	691	749	720	942	859	901
14:15:00	211	41626	689	750	720	947	889	918
14:15:15	211	41589	694	751	723	954	896	925
14:15:30	211	41435	699	752	726	959	898	929
14:15:45	211	41614	699	753	726	944	877	911
14:16:00	211	41615	694	754	724	948	883	916
14:16:15	211	41641	692	755	724	935	869	902
14:16:30	211	41624	691	756	724	946	892	919
14:16:45	211	41641	696	757	726	957	884	921
14:17:00	212	41619	701	757	729	957	888	923
14:17:15	211	41656	704	758	731	959	889	924
14:17:30	211	41619	706	759	732	954	891	923
14:17:45	211	41622	706	759	733	956	879	917

Fire Test Data - continued

14:18:00	211	41582	707	761	734	959	881	920
14:18:15	211	41631	707	762	734	957	889	923
14:18:30	211	41612	709	762	736	958	894	926
14:18:45	211	41564	711	763	737	958	891	925
14:19:00	211	41610	713	764	738	963	889	926
14:19:15	211	41614	715	764	740	964	894	929
14:19:30	211	41601	717	766	741	964	883	924
14:19:45	211	41560	716	766	741	954	888	921
14:20:00	211	41584	714	767	741	953	896	924
14:20:15	211	41589	713	768	741	953	886	919
14:20:30	211	41595	713	769	741	958	894	926
14:20:45	211	41612	713	769	741	956	890	923
14:21:00	211	41590	709	771	740	942	878	910
14:21:15	211	41567	703	771	737	938	884	911
14:21:30	211	41520	704	772	738	956	887	921
14:21:45	211	41582	702	773	738	946	876	911
14:22:00	211	41563	698	774	736	930	884	907
14:22:15	210	41608	694	774	734	931	888	909
14:22:30	211	41553	689	775	732	926	856	891
14:22:45	211	41620	685	775	730	928	882	905
14:23:00	210	41593	687	776	731	941	882	911
14:23:15	211	41598	689	776	733	942	876	909
14:23:30	210	41582	692	776	734	943	887	915
14:23:45	210	41585	693	776	735	936	883	910
14:24:00	211	41607	691	776	734	938	876	907
14:24:15	211	41596	694	777	736	952	881	916
14:24:30	210	41417	697	777	737	933	886	910
14:24:45	209	41425	712	777	745	885	811	848
14:25:00	209	41461	685	774	729	802	821	811
14:25:15	210	41468	677	767	722	868	869	869
14:25:30	210	41450	676	764	720	932	871	901
14:25:45	210	42609	681	763	722	943	857	900
14:26:00	210	40668	683	763	723	939	867	903
14:26:15	209	41684	684	763	723	928	883	906
14:26:30	210	41534	681	762	721	922	876	899
14:26:45	210	41528	680	762	721	928	888	908
14:27:00	210	41512	677	762	720	929	879	904
14:27:15	210	41495	672	763	717	903	878	891
14:27:30	210	41529	668	764	716	924	887	905
14:27:45	210	41517	667	764	716	928	859	894
14:28:00	210	41540	663	765	714	917	859	888
14:28:15	210	41483	665	766	715	937	881	909
14:28:30	210	41514	672	767	719	941	882	911

Fire Test Data - continued

14:28:45	209	41525	677	767	722	943	881	912
14:29:00	209	41495	680	768	724	941	876	908
14:29:15	209	41489	674	768	721	700	658	679
14:29:30	207	42047	649	760	704	423	468	446
14:29:45	206	40893	462	728	595	33	50	41
14:30:00	206	41084	311	642	476	27	33	30
14:30:15	206	40859	252	531	392	24	36	30
14:30:30	206	40954	218	406	312	24	42	33
14:30:45	206	40969	192	287	239	33	23	28
14:31:00	206	40979	157	193	175	31	19	25
14:31:15	206	40967	123	132	128	25	18	22
14:31:30	206	40951	98	94	96	23	17	20
14:31:45	206	40958	77	71	74	22	17	19
14:32:00	206	40949	62	57	59	18	16	17
14:32:15	206	40945	52	48	50	16	15	16
14:32:30	206	40942	45	42	44	14	15	15
14:32:45	206	40965	40	38	39	14	14	14
14:33:00	206	40947	37	36	36	14	14	14
14:33:15	206	40945	35	34	34	13	14	14
14:33:30	206	40926	33	33	33	13	14	14
14:33:45	206	40905	32	32	32	13	14	14
14:34:00	206	40980	32	32	32	13	14	13
14:34:15	206	40969	31	31	31	14	15	14
14:34:30	206	40937	31	32	31	14	16	15
14:34:45	206	40892	31	32	31	13	16	14
14:35:00	206	40960	31	32	31	12	16	14
14:35:15	206	40935	30	33	31	13	16	14
14:35:30	208	40952	30	34	32	15	16	16
14:35:45	208	40929	30	34	32	16	17	16
14:36:00	208	40939	31	34	33	17	18	17
14:36:15	208	40939	31	34	33	17	17	17
14:36:30	208	40926	31	34	33	17	18	18
14:36:45	208	40896	31	34	33	18	17	18
14:37:00	208	40952	31	35	33	18	18	18
14:37:15	207	40911	31	35	33	18	18	18
14:37:30	207	40937	32	35	33	19	18	19
14:37:45	207	40910	32	35	33	19	19	19
14:38:00	207	40940	32	35	33	19	18	18
14:38:15	207	40957	32	35	34	19	18	19
14:38:30	207	40915	32	35	34	19	19	19
14:38:45	207	40932	32	35	34	19	19	19
14:39:00	207	40927	33	36	34	19	18	19

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:	400	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:	133	mls
Water Collected in System Relief Valve:	100	mls
Calculated External Leakage During 40 Minute Duration:	33	mls
Average Leak Rate Over 40 Minute Duration:	0.8	ml/min
Allowable Leak Rate:	100	ml/min

Were the Valve Leakages Below the Allowables?	**Yes**

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:	214	psig
Average Pressure During Burn/Cool Down:	210	psig
Minimum Pressure During Burn/Cool Down:	206	psig
Amount of Time of Avg. Cal Block > 650 deg.C:	22.3	minutes
Minimum Allowable Time at Temperature:	15.0	minutes
Maximum Avg Cal Block Temperature:	745	deg. C
Average Cal Block Temperature:	513	deg. C
Lowest Avg Cal. Block Temperature:	31	deg. C
Maximum Body Flame Temperature During Burn:	898	deg. C
Average Body Flame Temperature During Burn:	865	deg. C
Maximum Bonnet Flame Temperature During Burn:	964	deg. C
Average Bonnet Flame Temperature During Burn:	922	deg. C
Average of Both Flame Temperatures During Burn:	893	deg. C

Note

Were Test Conditions Within Compliance?	**Yes**

Yarmouth Research and Technology, LLC

Post-Burn Seat Test Information

Customer: EV Metalværk A/S **Date:** 1/13/2016

Product Code: 1 inch Class 150 Monoflange Instrument Valve SDBB

Project Number: 215374

Test Data

Time	Pressure (psig)	Cal Block Temp - C
14:41:37	30	34
14:41:52	30	34
14:42:07	30	34
14:42:22	30	34
14:42:37	30	34
14:42:52	30	34
14:43:07	30	35
14:43:22	30	35
14:43:37	30	36
14:43:52	30	36
14:44:07	30	34
14:44:22	29	36
14:44:37	30	36
14:44:52	29	35
14:45:07	30	36
14:45:22	29	35
14:45:37	29	36
14:45:52	30	36
14:46:07	29	36
14:46:22	29	36
14:46:37	29	35

Total Seat Leakage Collected Over 5 Minute Duration:	0	mls
Average Leak Rate Over 5 Minute Duration:	0	ml/min
Allowable Leak Rate:	40	ml/min
Total External Leakage Collected Over 5 Minute Duration:	0	mls
Average Leak Rate Over 5 Minute Duration:	0	ml/min
Allowable Leak Rate:	20	ml/min

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

Yarmouth Research and Technology, LLC

Operational Test Information

Customer: EV Metalværk A/S **Date:** 1/13/2016

Product Code: 1 inch Class 150 Monoflange Instrument Valve SDBB

Project Number: 215374

Test Data

Time	Pressure (psig)	Cal Block Temp - C
14:49:43	210	36
14:49:58	210	36
14:50:13	210	36
14:50:28	209	36
14:50:43	209	36
14:50:58	209	36
14:51:13	209	36
14:51:28	209	36
14:51:43	209	36
14:51:58	209	36
14:52:13	209	36
14:52:28	209	36
14:52:43	209	36
14:52:58	209	36
14:53:13	209	36
14:53:28	209	35
14:53:43	209	36
14:53:58	209	36
14:54:13	209	36
14:54:28	209	36
14:54:43	209	36

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:	200	ml/min

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