

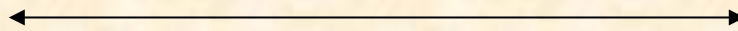
## **Fire Test Report**

**API Standard 6FA, Third Edition, April 1999**  
**“Specification for Fire Testing of Valves”**

*Performed for*

**EV Metalvaerk A/S**

[www.evmetal.dk](http://www.evmetal.dk)



**1/2 inch Class 1500**  
**Monoflange Instrument Valve SDBB**  
Product Code: 10#1500 1/2 RTJxNPT

**Project Number: 215374**  
**Test Date: January 19, 2016**

*Performed by*

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**YARMOUTH RESEARCH AND TECHNOLOGY, LLC**

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

[info@yarmouthresearch.com](mailto:info@yarmouthresearch.com)  
[www.yarmouthresearch.com](http://www.yarmouthresearch.com)

# Yarmouth Research and Technology, LLC

**Customer:** EV Metalværk A/S

**Date:** 1/19/2016

**Specification:** API Standard 6FA, Third Edition, April 1999 (R2008)

**Product Description:** 1/2 inch Class 1500 Monoflange Instrument Valve SDBB

**Project Number:** 215374

**Product Code:** 10# 1500 1/2 RTJxNPT

**Equipment Confirmed to be in Calibration to NIST Standards:** Yes

## ***Burn and Cool Down Test***

Burn Start Time:	10:46:00	
Average Pressure During Burn:	2683	psig
Seat Leak Rate During Burn:	0	ml/min
Allowable Seat Leak Rate:	200	ml/min
External Leak Rate During Burn/Cool Down:	2	ml/min
Allowable External Leak Rate:	50	ml/min
Amount of Time of Avg. Cal. Blocks > 650 deg. C:	22.0	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:	2700	psig
External Leak Rate After Operating:	0	ml/min
Allowable External Leak Rate:	100	ml/min
Was the Leakage Below the Allowable?	Yes	
<b>Does Valve Pass or Fail the Test Standard?</b>	<b>PASS</b>	

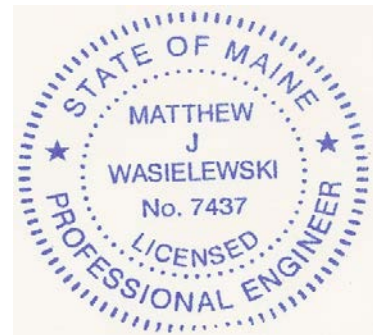
**Certified By:**



Matthew Wasielewski, PE

President and Manager

Yarmouth Research and Technology, LLC

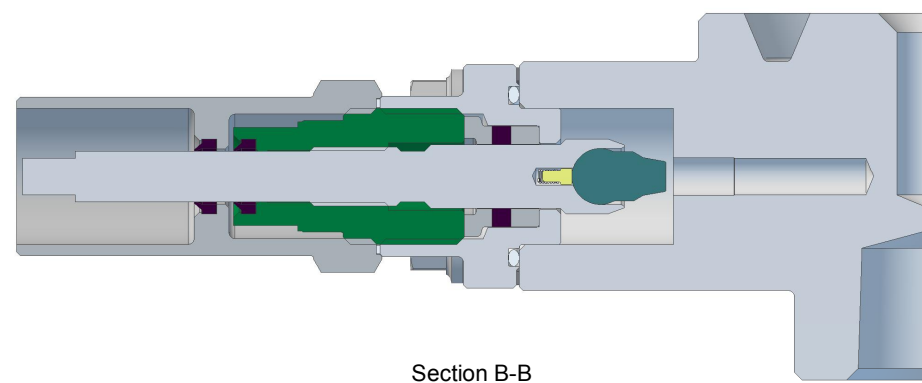
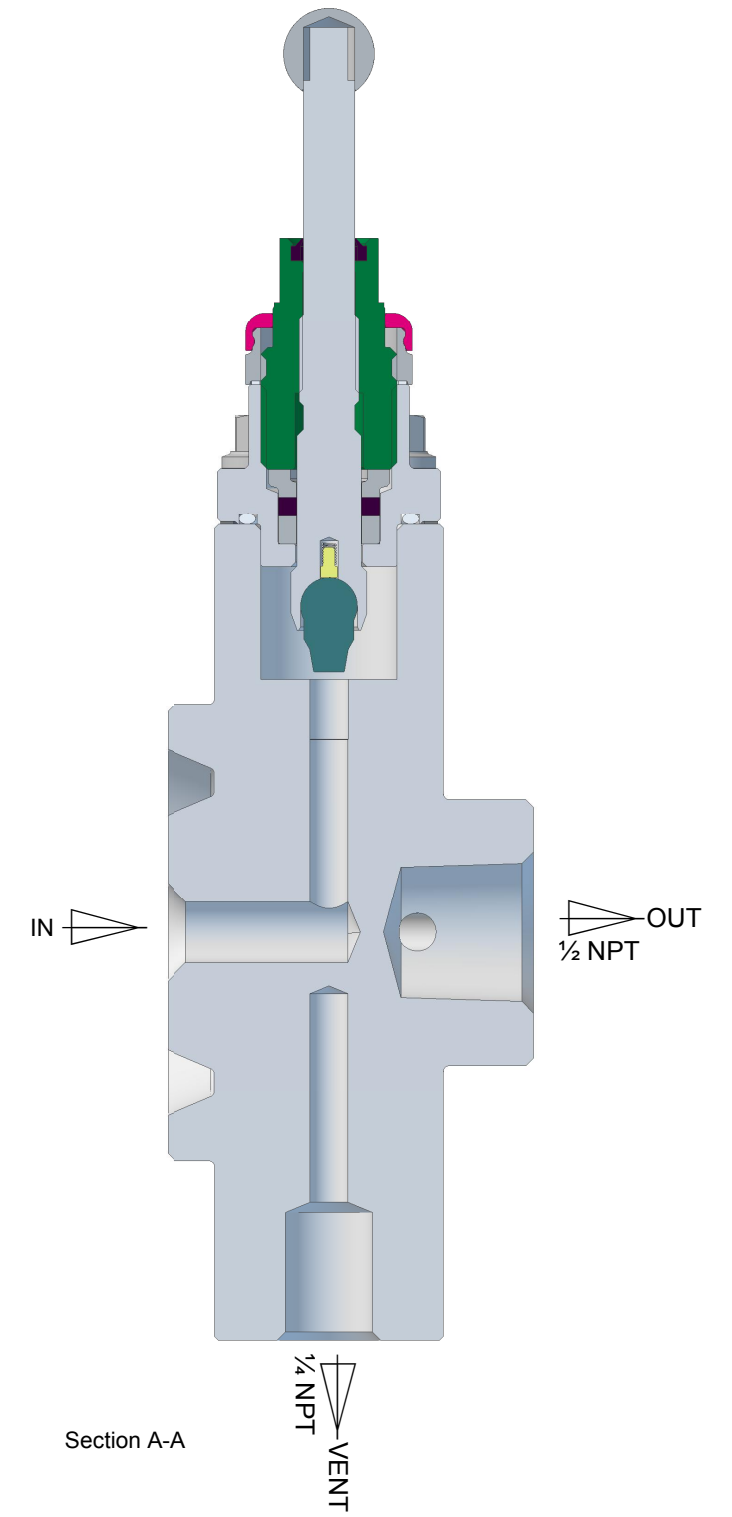
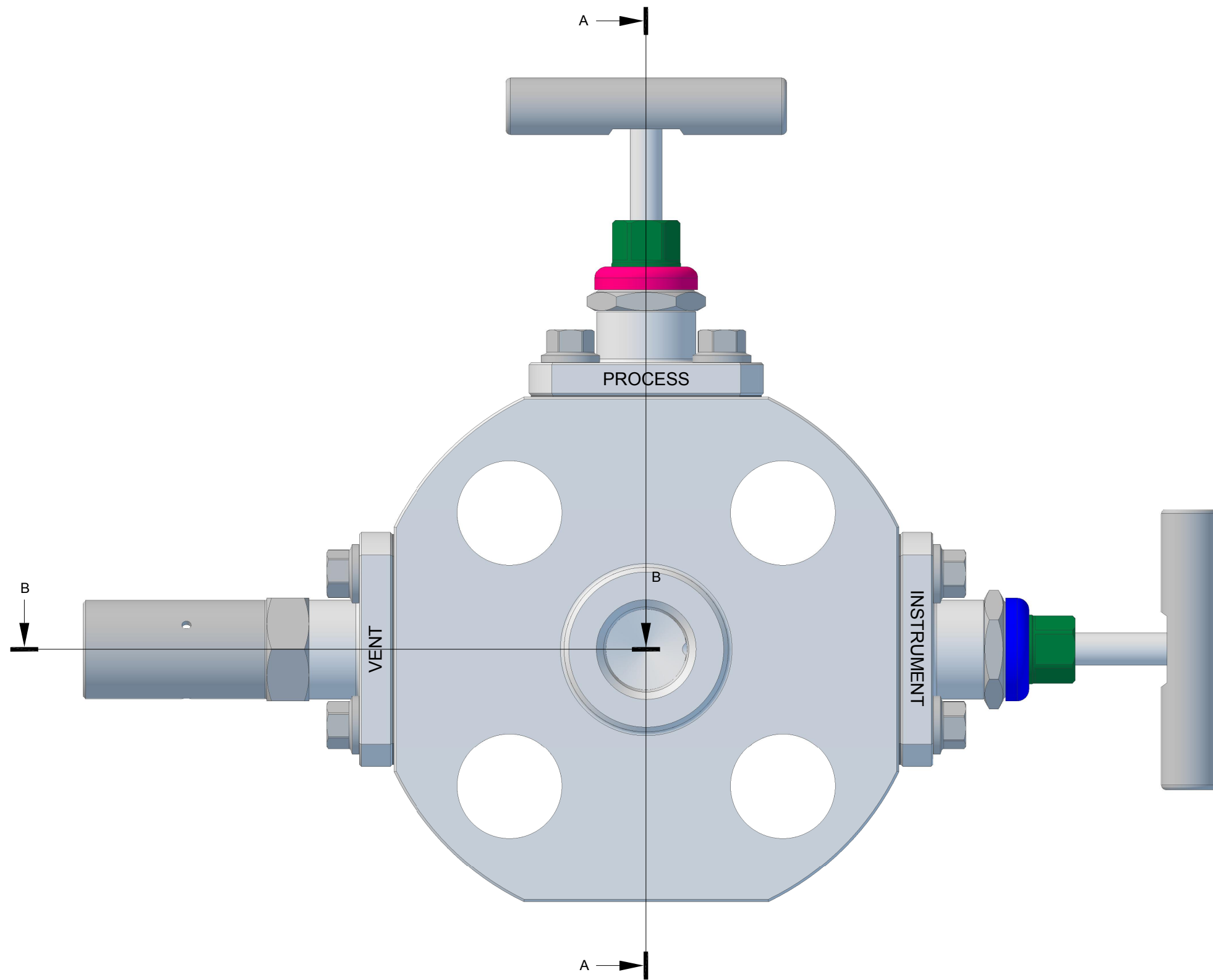



YARMOUTH RESEARCH AND TECHNOLOGY, LLC

**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:	<a href="http://www.evmetal.dk">www.evmetal.dk</a>
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#1500 1/2 RTJxNPT
<b>Valve Description</b>	
Size:	1/2"
Pressure Rating/Class:	# 1500
Pressure Rating at 100F (psig):	3600 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
<b>Valve Markings</b>	
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

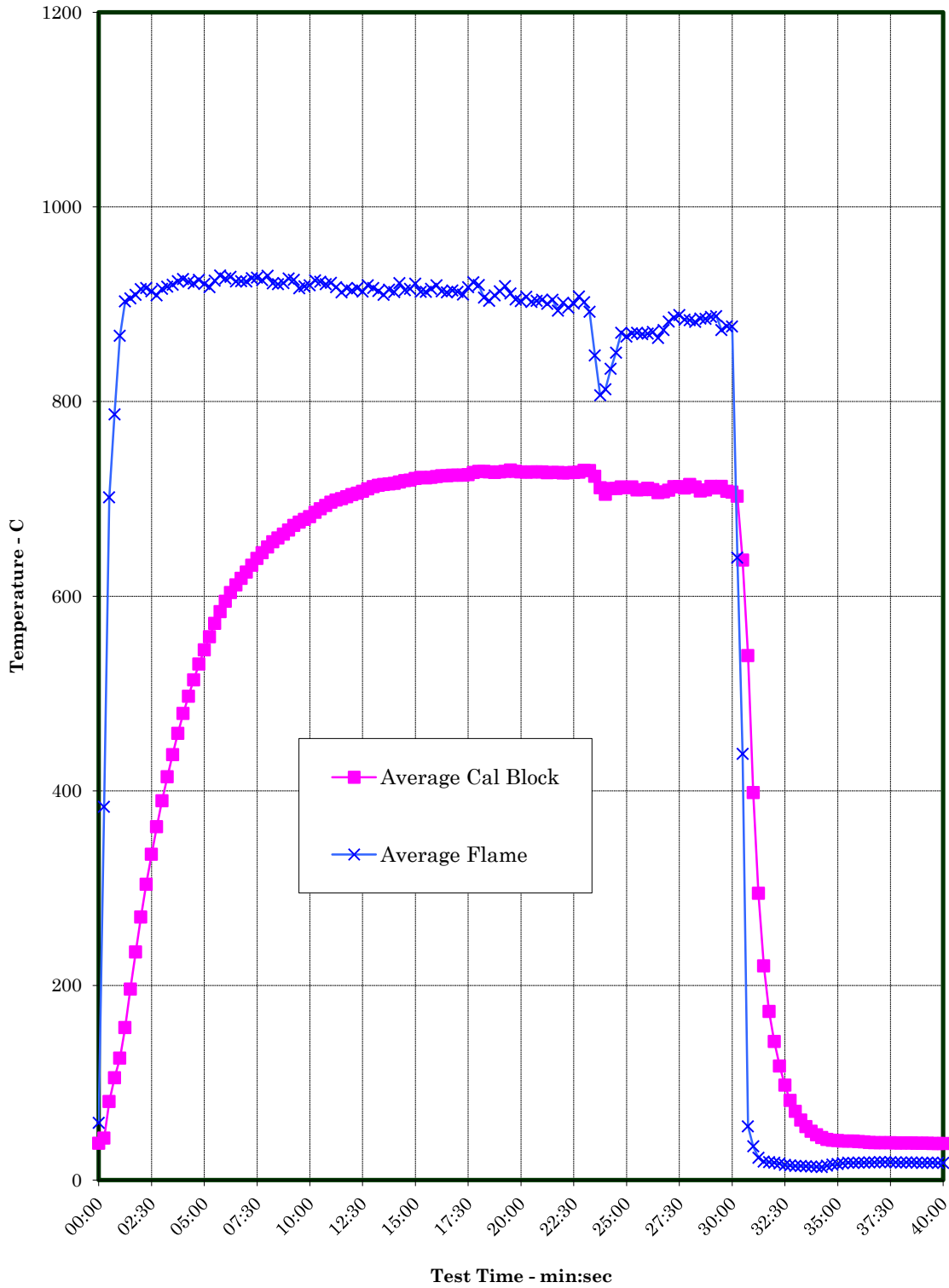
***PLEASE RETURN AS AN EXCEL DOCUMENT***



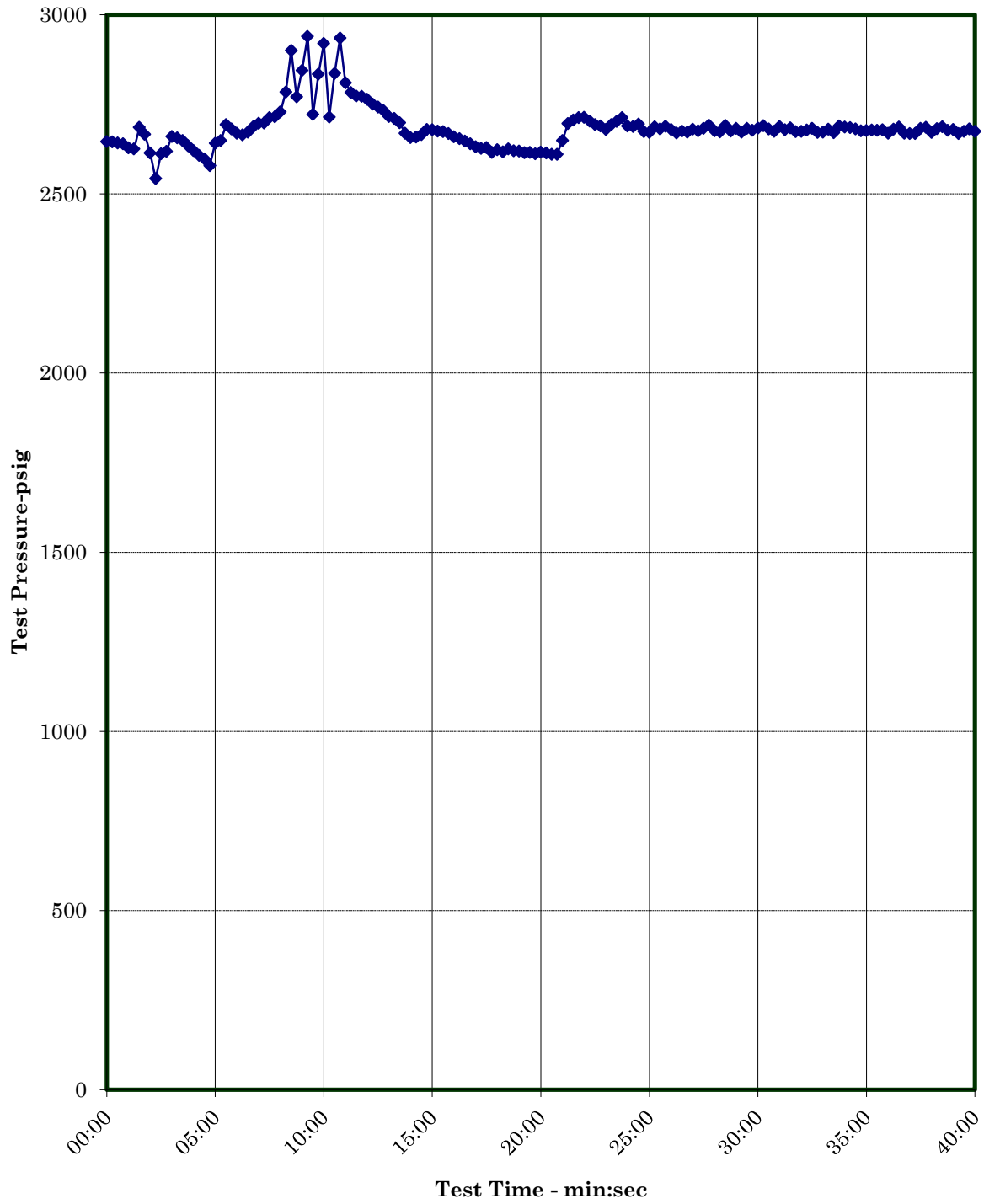
 EV METALVÆRK A/S RIBOVEJ 1 DK-6950 RINGKØBING	Scale	Date	Drawn by	Material		
	1:1	19.01.15	NBJ			
	A3	Post treatment		Weight	Dim.	
Edges deburred. Dimensions without tolerance ±0.1 mm						
Designation				Dwg. no.		
Slimline Block & Bleed valve						

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**



**Pressure verses Time Chart**

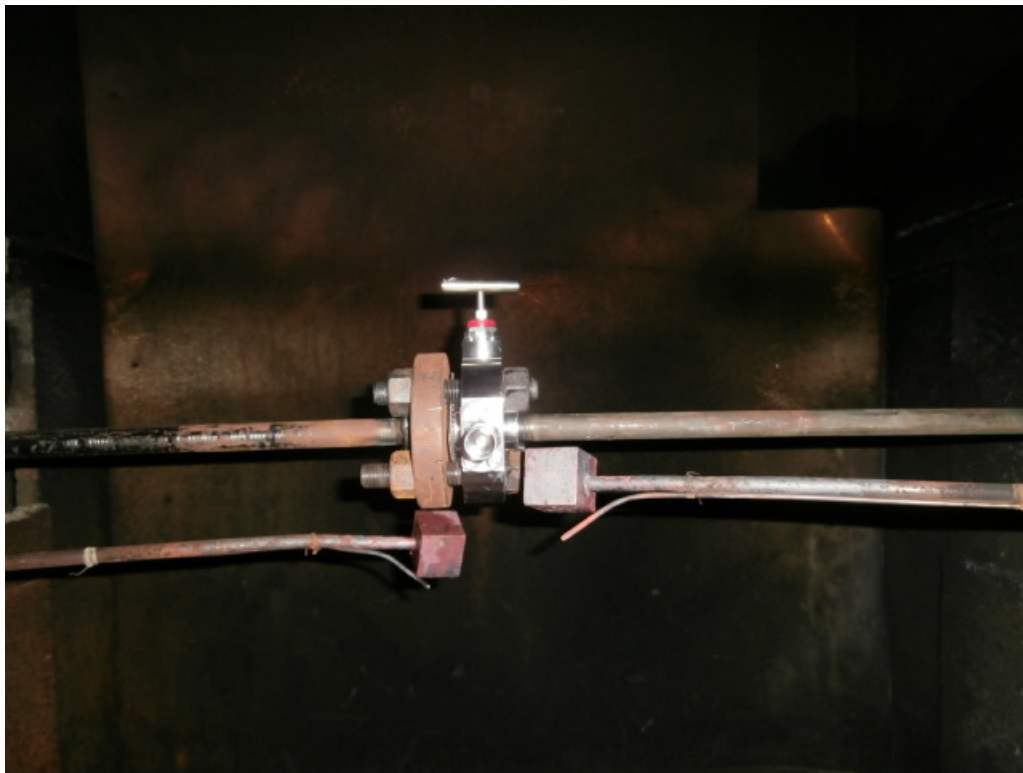




Yarmouth Research and Technology, LLC



Valve Markings



Test Setup Prior to Burn

Yarmouth Research and Technology, LLC



Test Valve During Burn



## Yarmouth Research and Technology, LLC

### Fire Test Information

**Customer:** EV Metalværk A/S

**Date:** 1/19/2016

**Product Code:** 1/2 inch Class 1500 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
10:46:00	2646	33825	34	41	38	31	87	59
10:46:15	2645	33828	43	43	43	284	483	384
10:46:30	2642	33839	101	61	81	658	746	702
10:46:45	2640	33829	119	91	105	744	829	787
10:47:00	2628	33856	133	117	125	879	856	868
10:47:15	2625	33841	174	139	157	940	866	903
10:47:30	2685	33832	224	168	196	943	868	906
10:47:45	2666	33816	276	193	234	946	874	910
10:48:00	2614	33829	324	217	270	954	877	916
10:48:15	2542	33747	366	242	304	957	876	917
10:48:30	2612	33850	400	269	335	954	872	913
10:48:45	2619	33823	427	299	363	947	872	909
10:49:00	2660	33790	451	328	390	956	876	916
10:49:15	2656	33791	472	357	414	963	873	918
10:49:30	2648	33800	491	384	437	961	879	920
10:49:45	2635	33739	509	409	459	968	879	924
10:50:00	2620	33730	526	433	479	969	882	926
10:50:15	2607	33749	539	455	497	964	882	923
10:50:30	2597	33772	552	476	514	966	877	921
10:50:45	2579	33814	566	495	530	968	882	925
10:51:00	2641	33726	577	512	545	968	873	921
10:51:15	2649	33721	588	528	558	962	873	918
10:51:30	2693	33716	600	544	572	967	882	924
10:51:45	2681	33724	611	558	584	976	883	929
10:52:00	2669	33715	618	571	595	969	883	926
10:52:15	2664	33719	623	584	604	969	887	928
10:52:30	2672	33689	627	596	611	963	884	923
10:52:45	2687	33693	631	606	618	966	882	924
10:53:00	2696	33687	633	616	625	963	883	923
10:53:15	2697	33700	638	626	632	966	887	927
10:53:30	2713	33693	643	634	639	967	888	927
10:53:45	2715	33710	646	643	645	962	887	925
10:54:00	2728	33775	650	651	651	971	888	929

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### *Fire Test Data - continued*

10:54:15	2784	33774	653	658	656	957	886	921
10:54:30	2900	33714	654	665	660	957	884	921
10:54:45	2770	33739	656	671	664	954	889	922
10:55:00	2845	33705	659	677	668	963	890	926
10:55:15	2939	33717	663	682	673	962	888	925
10:55:30	2722	33719	665	687	676	943	889	916
10:55:45	2834	33697	666	692	679	949	888	918
10:56:00	2920	33724	667	697	682	947	892	919
10:56:15	2714	33687	671	701	686	958	891	924
10:56:30	2836	33762	674	705	690	952	894	923
10:56:45	2935	33646	677	709	693	949	892	921
10:57:00	2810	33652	680	713	696	949	895	922
10:57:15	2783	33736	681	716	699	939	896	918
10:57:30	2773	33698	681	719	700	932	893	912
10:57:45	2772	33714	682	723	702	939	893	916
10:58:00	2764	33748	683	726	704	934	894	914
10:58:15	2750	33759	683	728	706	938	895	917
10:58:30	2742	33676	684	731	708	932	894	913
10:58:45	2732	33736	687	734	710	949	890	919
10:59:00	2716	33705	689	736	713	941	893	917
10:59:15	2710	33677	689	738	714	933	894	914
10:59:30	2698	33729	689	741	715	924	896	910
10:59:45	2669	33720	688	742	715	936	894	915
11:00:00	2656	33681	688	744	716	935	890	913
11:00:15	2658	33658	689	745	717	950	893	922
11:00:30	2665	33721	691	747	719	939	890	914
11:00:45	2680	33724	691	748	719	938	894	916
11:01:00	2678	33682	692	749	721	950	892	921
11:01:15	2675	33687	693	751	722	932	893	913
11:01:30	2673	33708	692	751	721	931	894	913
11:01:45	2668	33692	692	752	722	938	894	916
11:02:00	2659	33646	692	753	723	947	892	919
11:02:15	2654	33711	693	754	724	932	895	913
11:02:30	2647	33684	692	756	724	931	894	912
11:02:45	2639	33673	692	756	724	935	893	914
11:03:00	2632	33679	691	757	724	933	892	913
11:03:15	2627	33699	690	758	724	925	895	910
11:03:30	2629	33704	690	759	725	941	894	918
11:03:45	2615	33666	693	761	727	950	895	923
11:04:00	2623	33643	695	761	728	947	893	920
11:04:15	2617	33701	694	762	728	921	892	907
11:04:30	2625	33673	692	763	728	914	893	903
11:04:45	2620	33646	690	764	727	923	895	909

## Yarmouth Research and Technology, LLC

### *Fire Test Data - continued*

11:05:00	2619	33696	690	765	728	933	894	913
11:05:15	2615	33670	691	766	728	939	898	919
11:05:30	2616	33614	692	767	729	927	896	911
11:05:45	2611	33694	689	767	728	914	896	905
11:06:00	2616	33679	687	768	728	908	898	903
11:06:15	2614	33627	686	768	727	918	897	908
11:06:30	2610	33593	686	769	728	910	894	902
11:06:45	2610	33699	685	770	728	913	894	903
11:07:00	2649	33634	684	771	728	919	889	904
11:07:15	2696	33660	682	771	727	904	897	900
11:07:30	2706	33627	682	772	727	918	891	904
11:07:45	2713	33636	682	772	727	895	892	893
11:08:00	2713	33655	680	773	726	906	897	901
11:08:15	2703	33646	680	773	727	897	896	896
11:08:30	2693	33666	679	774	727	908	893	901
11:08:45	2689	33678	680	774	727	926	890	908
11:09:00	2679	33648	683	775	729	912	892	902
11:09:15	2693	33677	682	776	729	892	892	892
11:09:30	2702	31558	672	774	723	888	806	847
11:09:45	2713	30820	666	757	711	850	763	806
11:10:00	2689	30494	668	741	705	846	779	813
11:10:15	2688	30513	672	749	710	863	804	834
11:10:30	2694	30493	674	747	711	895	806	850
11:10:45	2673	30491	679	745	712	899	842	871
11:11:00	2671	30478	679	743	711	900	833	867
11:11:15	2687	30507	679	745	712	901	839	870
11:11:30	2681	30512	676	742	709	887	854	871
11:11:45	2688	30515	674	744	709	884	854	869
11:12:00	2679	30521	672	749	711	886	854	870
11:12:15	2669	30505	671	748	709	887	856	871
11:12:30	2675	30498	669	743	706	877	854	865
11:12:45	2672	30489	669	745	707	901	846	873
11:13:00	2680	30516	672	745	709	918	847	882
11:13:15	2676	30524	677	748	712	924	848	886
11:13:30	2683	30506	681	744	712	927	851	889
11:13:45	2691	30513	683	739	711	921	848	884
11:14:00	2675	30512	683	747	715	910	857	884
11:14:15	2672	30497	679	745	712	903	861	882
11:14:30	2691	30517	677	739	708	916	855	885
11:14:45	2675	30507	678	740	709	922	848	885
11:15:00	2683	30502	680	745	713	928	846	887
11:15:15	2672	30513	682	740	711	919	857	888
11:15:30	2682	30513	679	746	713	881	866	873

## Yarmouth Research and Technology, LLC

### *Fire Test Data - continued*

11:15:45	2677	30494	674	742	708	885	869	877
11:16:00	2684	30518	669	744	707	887	867	877
11:16:15	2690	30515	661	745	703	655	624	639
11:16:30	2681	30537	636	638	637	432	444	438
11:16:45	2674	30509	507	571	539	33	78	55
11:17:00	2688	30507	350	446	398	21	48	35
11:17:15	2679	30509	281	309	295	19	27	23
11:17:30	2684	30488	240	200	220	18	21	19
11:17:45	2673	30506	213	134	173	19	18	19
11:18:00	2674	30504	189	96	143	18	17	18
11:18:15	2678	30514	161	74	117	17	17	17
11:18:30	2682	30498	132	63	98	14	17	16
11:18:45	2671	30497	109	54	82	14	16	15
11:19:00	2672	30516	90	51	71	13	16	14
11:19:15	2680	30494	74	49	62	13	16	14
11:19:30	2670	30511	63	47	55	13	15	14
11:19:45	2689	30494	54	46	50	13	15	14
11:20:00	2687	30520	48	44	46	13	14	14
11:20:15	2685	30500	43	44	44	13	14	13
11:20:30	2681	30525	40	43	42	14	15	15
11:20:45	2675	30550	38	43	41	16	16	16
11:21:00	2676	30459	38	43	41	16	17	16
11:21:15	2678	30530	37	43	40	17	17	17
11:21:30	2678	30454	37	43	40	18	18	18
11:21:45	2679	30530	36	44	40	17	18	18
11:22:00	2669	30485	36	43	39	18	18	18
11:22:15	2680	30531	36	43	39	18	18	18
11:22:30	2686	30505	35	42	39	18	18	18
11:22:45	2669	30419	35	42	38	18	18	18
11:23:00	2668	30458	35	42	38	19	18	19
11:23:15	2668	30535	35	42	38	18	18	18
11:23:30	2682	30487	35	42	38	18	19	19
11:23:45	2685	30544	35	41	38	18	18	18
11:24:00	2671	30515	35	41	38	18	18	18
11:24:15	2681	30540	35	41	38	18	18	18
11:24:30	2687	30506	35	41	38	18	18	18
11:24:45	2678	30534	35	41	38	18	18	18
11:25:00	2679	30462	35	41	38	17	18	18
11:25:15	2668	30499	35	41	38	18	18	18
11:25:30	2674	30509	35	40	38	18	18	18
11:25:45	2681	30542	35	40	38	17	18	18
11:26:00	2674	30546	35	40	38	17	18	18

## Yarmouth Research and Technology, LLC

### Leakage Summary for Burn and Cool Down Periods

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All pressure transducers and thermocouples are in calibration per YRT's QA program.

Seat leakages were collected manually. External leakage was collected electronically.

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Total Through Seat Leakage Collected Over 30 Minute Duration:	0	mls
Average Leak Rate Over 30 Minute Duration:	0	ml/min
Allowable Leak Rate:	200	ml/min
<hr/>		
Total Through Seat Leakage Collected Over 10 Minute Cool Down:	0	mls
<hr/>		
Total Water Volume Lost Over 40 Minute Burn and Cool Down:	3279	mls
Water Collected in System Relief Valve:	3200	mls
Calculated External Leakage During 40 Minute Duration:	79	mls
Average Leak Rate Over 40 Minute Duration:	2	ml/min
Allowable Leak Rate:	50	ml/min

<b>Were the Valve Leakages Below the Allowables?</b>	<b>Yes</b>
------------------------------------------------------	------------

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**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:	2939	psig
Average Pressure During Burn/Cool Down:	2683	psig
Minimum Pressure During Burn/Cool Down:	2542	psig
Amount of Time of Avg. Cal Block > 650 deg.C:	22.0	minutes
Minimum Allowable Time at Temperature:	15.0	minutes
Maximum Avg Cal Block Temperature:	729	deg. C
Average Cal Block Temperature:	504	deg. C
Lowest Avg Cal. Block Temperature:	38	deg. C
Maximum Body Flame Temperature During Burn:	898	deg. C
Average Body Flame Temperature During Burn:	867	deg. C
Maximum Bonnet Flame Temperature During Burn:	976	deg. C
Average Bonnet Flame Temperature During Burn:	915	deg. C
Average of Both Flame Temperatures During Burn:	891	deg. C

*Note*

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Were Test Conditions Within Compliance?	Yes
-----------------------------------------	-----



**Yarmouth Research and Technology, LLC**

**Post-Burn Seat Test Information**

**Customer:** EV Metalværk A/S

**Date:** 1/19/2016

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**Product Code:** 1/2 inch Class 1500 Monoflange Instrument Valve SDBB

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**Project Number:** 215374

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*This test is not required for this pressure class.*

# Yarmouth Research and Technology, LLC

## Operational Test Information

Customer: EV Metalværk A/S

Date: 1/19/2016

Product Code: 1/2 inch Class 1500 Monoflange Instrument Valve SDBB

Project Number: 215374

## Test Data

Time	Pressure (psig)	Cal Block Temp - C
11:27:47	2701	37
11:28:02	2700	37
11:28:17	2704	37
11:28:32	2701	37
11:28:47	2697	37
11:29:02	2697	37
11:29:17	2699	37
11:29:32	2701	37
11:29:47	2700	37
11:30:02	2702	37
11:30:17	2700	37
11:30:32	2701	37
11:30:47	2700	37
11:31:02	2701	37
11:31:17	2701	37
11:31:32	2699	37
11:31:47	2700	37
11:32:02	2700	37
11:32:17	2700	37
11:32:32	2701	37
11:32:47	2702	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:	100	ml/min

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