

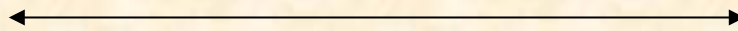
Fire Test Report

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

Performed for

EV Metalvaerk A/S

www.evmetal.dk



1/2 inch Class 300
Monoflange Instrument Valve SDBB
Product Code: 10#300 1/2 RFxNPT

Project Number: 215374
Test Date: March 7, 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: 3/7/2016

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

Product Description: 0.5 inch Class 300 Monoflange instrument valve SDBB

Project Number: 215374

Product Code: 10#300 1/2 RFxNPT

Equipment Confirmed to be in Calibration to NIST Standards: Yes

Burn and Cool Down Test

Burn Start Time:	10:40:00	
Average Pressure During Burn:	536	psig
Seat Leak Rate During Burn:	0	ml/min
Allowable Seat Leak Rate:	200	ml/min
External Leak Rate During Burn/Cool Down:	1.6	ml/min
Allowable External Leak Rate:	50	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	

Post-burn Test

Average Pressure During Test:	51	psig
Seat Leak Rate:	0	ml/min
Allowable Seat Leak Rate:	20	ml/min
Average Leak Rate Over 5 Minute Duration:	0	ml/min
Allowable Leak Rate:	10	ml/min
Was the Leakage Below the Allowable?	Yes	

Operational Test

Did Valve Unseat and Open Fully?:	Yes	
Average Pressure During Test:	538	psig
External Leak Rate After Operating:	0	ml/min
Allowable External Leak Rate:	100	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

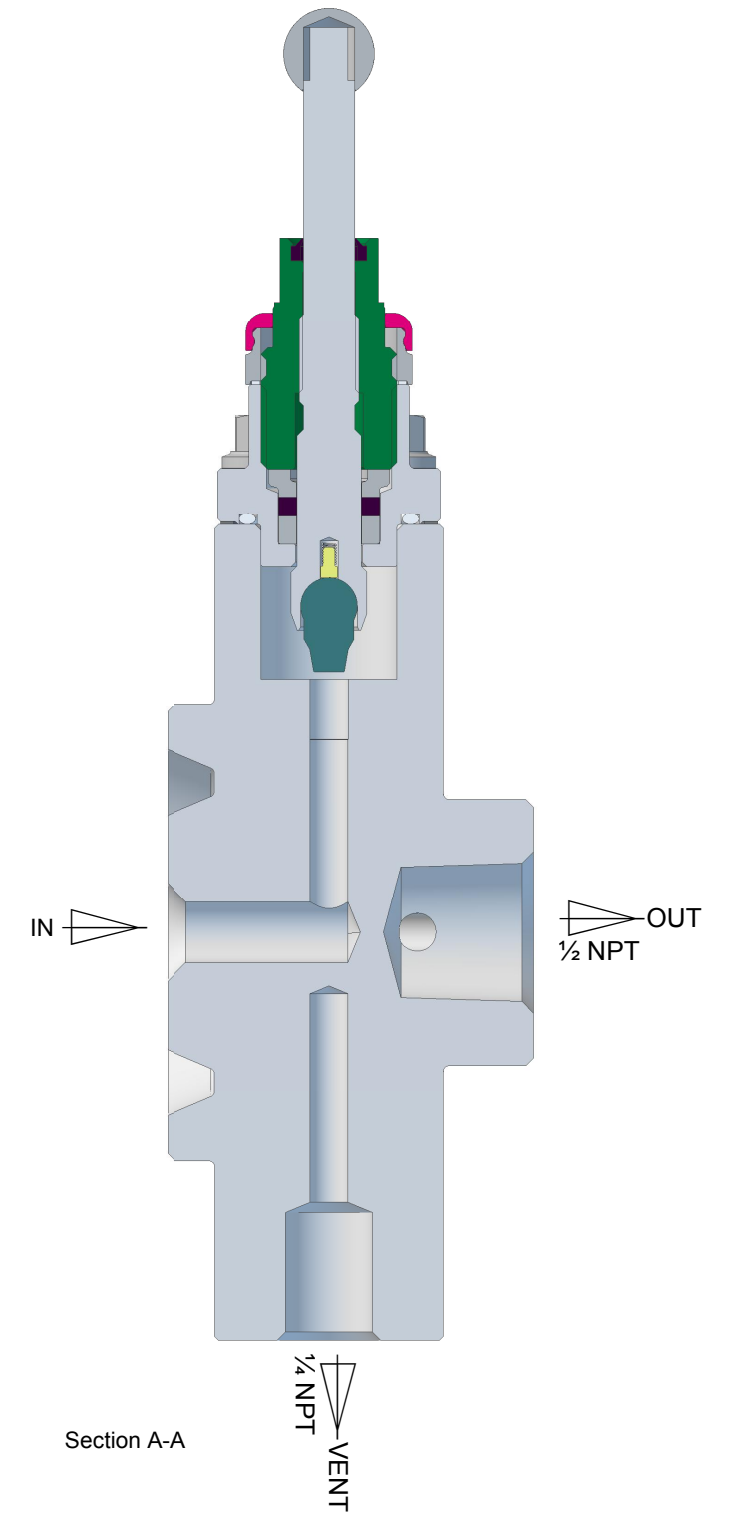
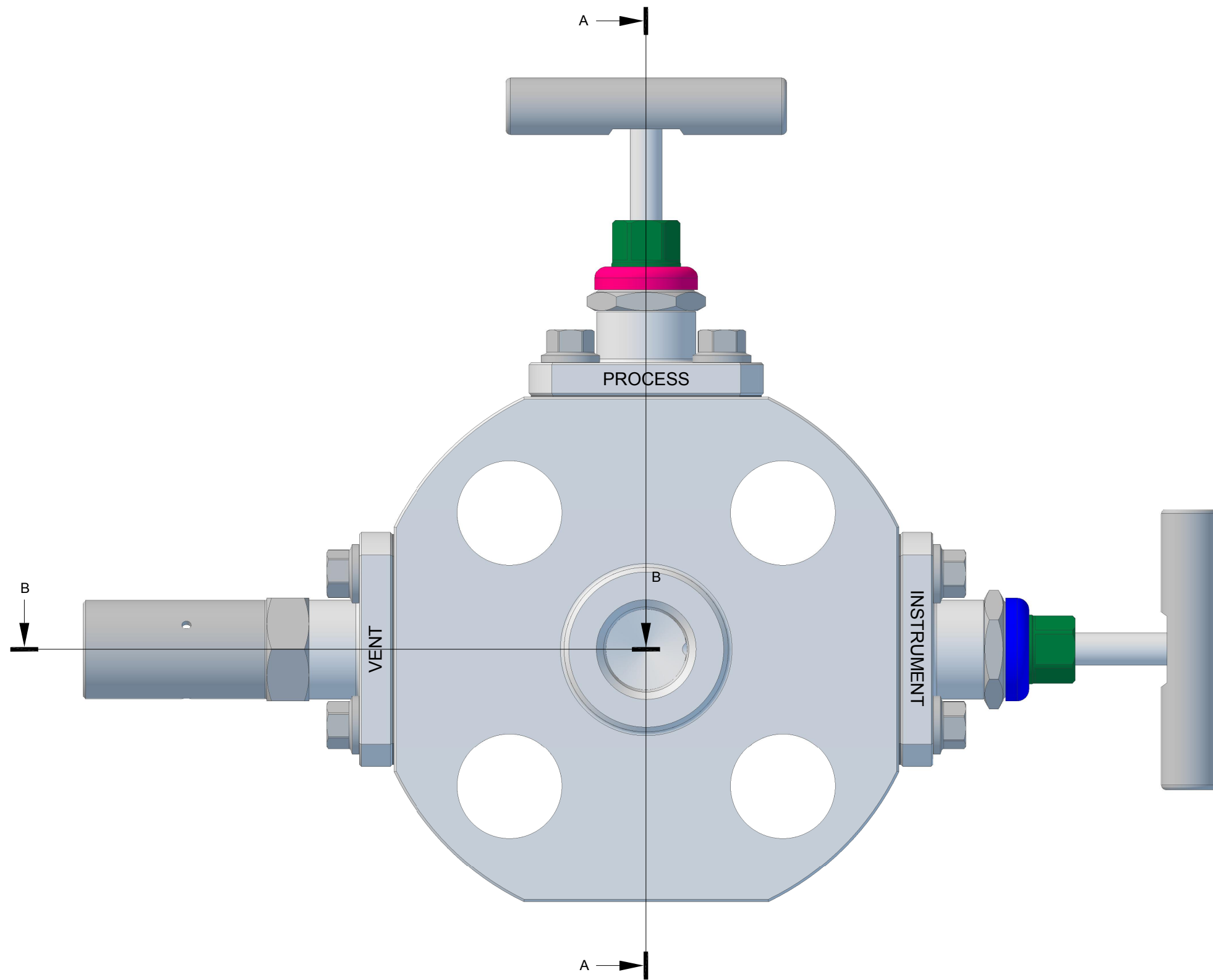


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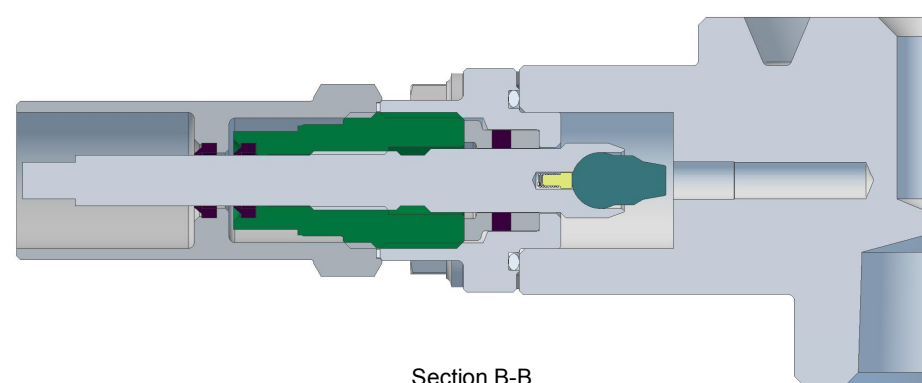
Fire Test Information Sheet

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 Ringkøbing, 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#300 1/2 RFxNPT
Valve Description	
Size:	1/2"
Pressure Rating/Class:	# 300
Pressure Rating at 100F (psig):	720 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:	15-12-2015

PLEASE RETURN AS AN EXCEL DOCUMENT



Section A-A



Section B-B

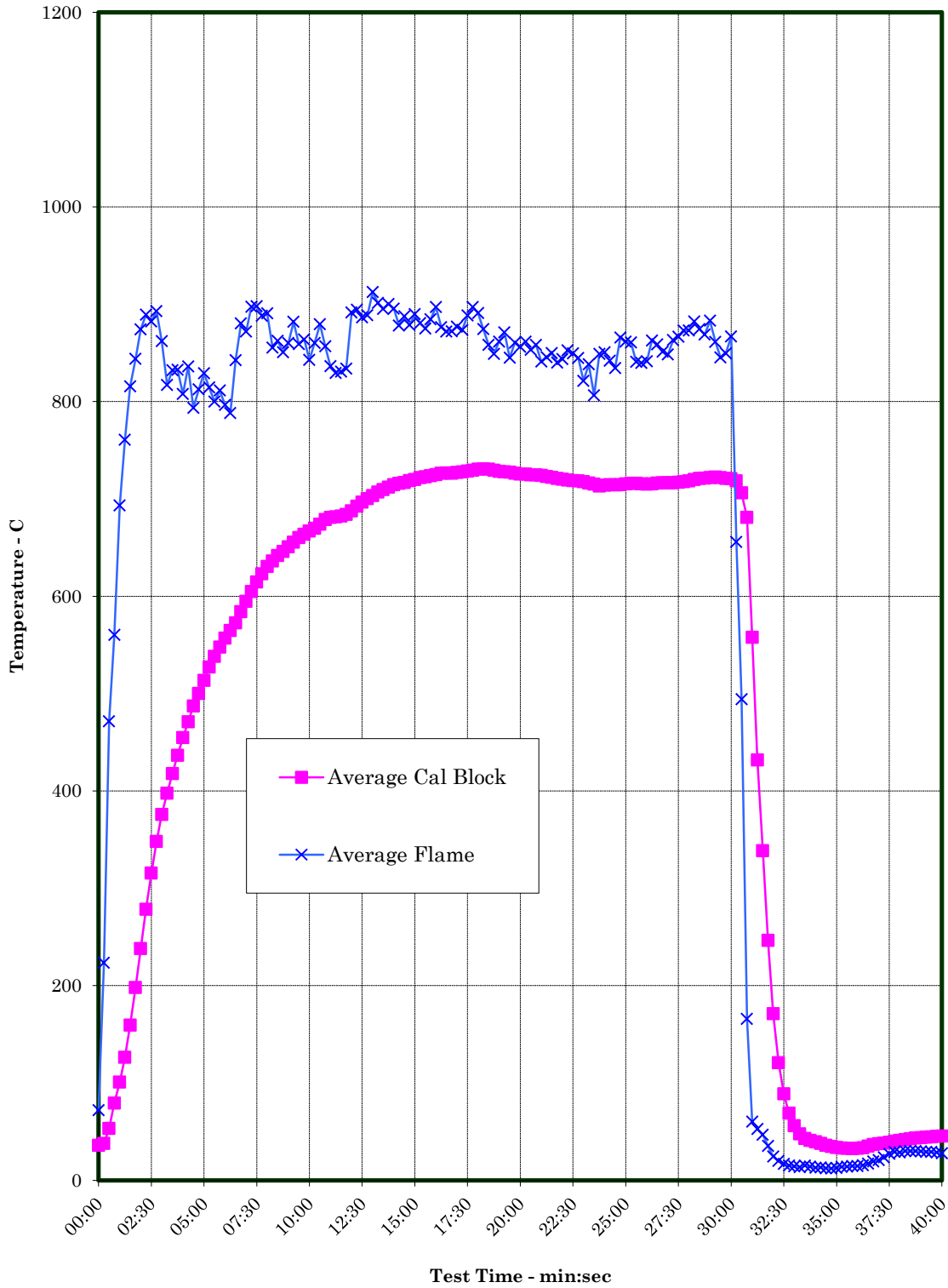


EV METALVÆRK A/S
RIBOVEJ 1
DK-6950 RINGKØBING

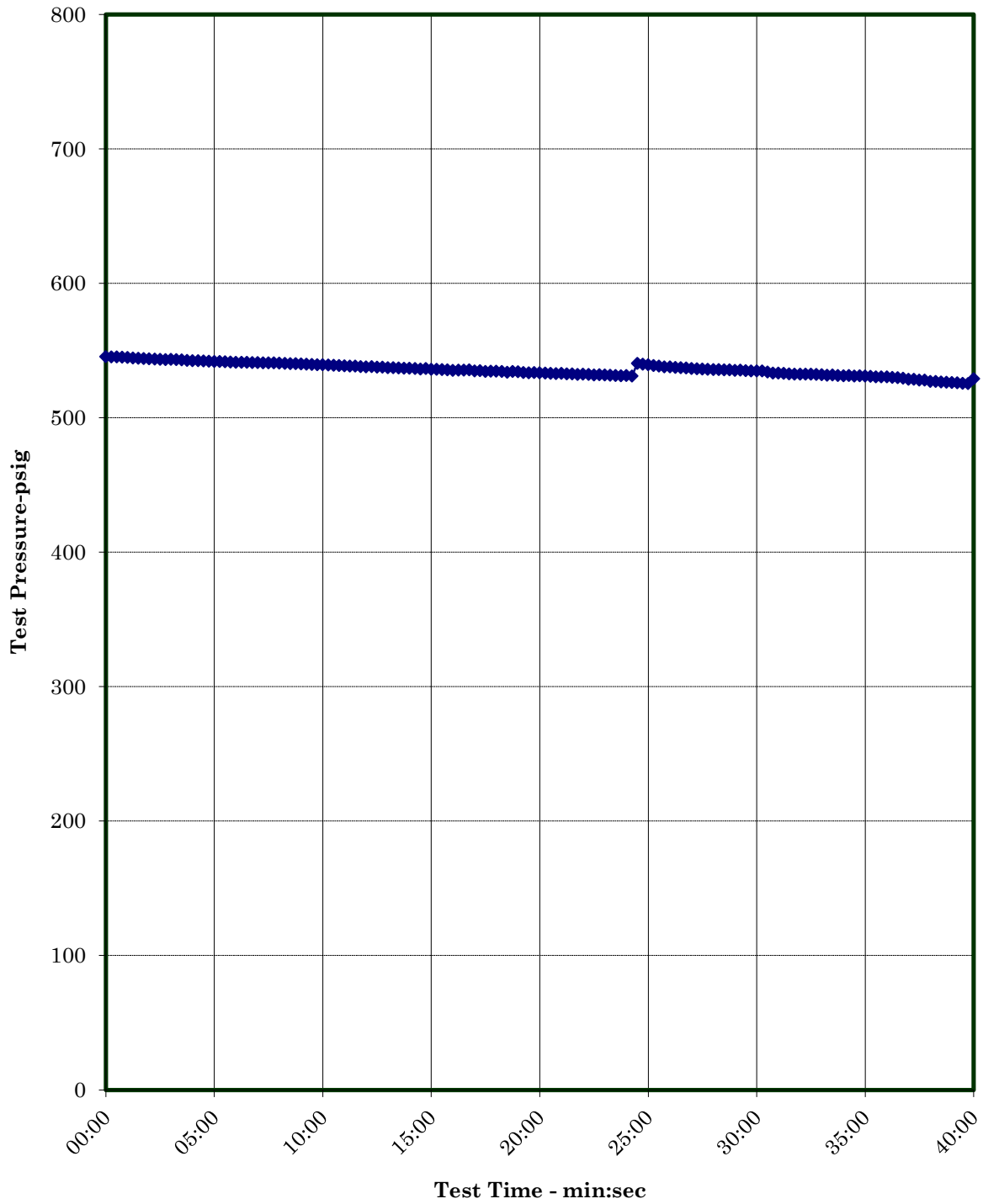
Scale	Date	Drawn by	Material	Weight	Dim.
1:1	19.01.15	NBJ			
A3	Post treatment				
Edges deburred. Dimensions without tolerance ±0.1 mm					
Designation			Dwg. no.		
Slimline Block & Bleed valve					

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: 3/7/2016

Product Code: 0.5 inch Class 300 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
10:40:00	546	38243	37	35	36	73	71	72
10:40:15	545	38253	39	37	38	314	133	224
10:40:30	545	38253	61	46	53	653	290	472
10:40:45	545	38262	99	60	79	743	378	560
10:41:00	545	38255	121	81	101	772	614	693
10:41:15	544	38266	143	110	126	828	693	761
10:41:30	544	38248	175	144	159	844	787	816
10:41:45	544	38265	214	182	198	855	833	844
10:42:00	544	38271	256	221	238	864	884	874
10:42:15	544	38257	298	258	278	876	902	889
10:42:30	544	38259	341	291	316	874	891	882
10:42:45	543	38272	377	319	348	883	902	893
10:43:00	543	38258	407	344	376	877	848	862
10:43:15	543	38246	432	364	398	859	774	817
10:43:30	543	38266	453	382	418	859	806	832
10:43:45	543	38260	473	401	437	867	798	833
10:44:00	542	38200	492	418	455	859	757	808
10:44:15	542	38254	508	434	471	868	804	836
10:44:30	542	38258	524	450	487	847	740	794
10:44:45	542	38258	537	463	500	864	761	813
10:45:00	542	38273	550	477	514	844	814	829
10:45:15	542	38257	561	493	527	851	778	814
10:45:30	542	38251	572	504	538	847	753	800
10:45:45	542	38296	582	514	548	863	759	811
10:46:00	541	38290	591	523	557	844	749	797
10:46:15	541	38300	598	531	565	841	736	788
10:46:30	541	38299	606	539	573	892	793	843
10:46:45	541	38302	618	551	584	931	829	880
10:47:00	541	38291	629	561	595	940	804	872
10:47:15	541	38313	638	571	605	936	859	898
10:47:30	541	38320	647	583	615	937	859	898
10:47:45	541	38323	654	592	623	937	839	888
10:48:00	541	38356	662	599	631	935	846	891

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Fire Test Data - continued

10:48:15	540	38354	668	604	636	918	793	855
10:48:30	540	38318	674	609	642	922	803	863
10:48:45	540	38327	679	613	646	922	779	851
10:49:00	540	38343	684	617	651	922	799	860
10:49:15	540	38345	689	622	656	921	843	882
10:49:30	540	38359	694	627	660	921	798	859
10:49:45	539	38339	698	629	664	927	801	864
10:50:00	539	38328	703	631	667	921	764	843
10:50:15	539	38326	707	633	670	921	800	860
10:50:30	539	38365	711	637	674	934	825	879
10:50:45	539	38325	715	642	679	914	799	857
10:51:00	539	38352	717	644	681	909	764	836
10:51:15	539	38341	719	644	682	911	748	829
10:51:30	538	38359	721	644	683	919	742	831
10:51:45	538	38370	723	645	684	892	776	834
10:52:00	538	38354	724	651	688	906	877	891
10:52:15	538	38361	726	659	693	912	877	894
10:52:30	538	38348	727	667	697	901	872	886
10:52:45	538	38335	728	673	700	896	882	889
10:53:00	537	38357	728	679	703	913	912	913
10:53:15	537	38365	729	684	707	915	888	901
10:53:30	537	38362	731	688	709	904	887	895
10:53:45	537	38353	732	692	712	908	893	900
10:54:00	537	38345	733	696	714	907	884	896
10:54:15	537	38331	733	698	716	910	846	878
10:54:30	536	38370	734	699	717	914	861	888
10:54:45	537	38370	735	703	719	907	850	879
10:55:00	536	38377	735	705	720	898	881	890
10:55:15	536	38350	735	709	722	897	864	881
10:55:30	536	38391	734	711	723	889	861	875
10:55:45	536	38342	734	713	724	911	858	884
10:56:00	535	38407	735	715	725	903	892	897
10:56:15	536	38375	736	717	726	884	869	876
10:56:30	535	38386	734	719	727	886	858	872
10:56:45	536	38371	733	719	726	882	862	872
10:57:00	535	38393	733	722	727	870	884	877
10:57:15	535	38327	731	724	728	863	884	874
10:57:30	534	38369	731	727	729	893	884	888
10:57:45	535	38417	731	728	729	891	903	897
10:58:00	535	38389	730	731	731	871	911	891
10:58:15	534	38391	728	733	731	847	902	874
10:58:30	534	38370	726	736	731	834	882	858
10:58:45	534	38345	723	736	729	818	879	849

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Fire Test Data - continued

10:59:00	534	38370	720	737	728	844	879	862
10:59:15	534	38384	719	737	728	867	876	871
10:59:30	534	38353	719	736	728	857	833	845
10:59:45	534	38383	718	735	726	838	883	861
11:00:00	533	38406	716	736	726	834	878	856
11:00:15	533	38345	714	737	726	837	886	862
11:00:30	533	38397	713	737	725	832	874	853
11:00:45	533	38380	712	738	725	831	885	858
11:01:00	533	38362	710	738	724	829	853	841
11:01:15	533	38370	708	738	723	804	887	846
11:01:30	533	38379	705	739	722	811	889	850
11:01:45	532	38379	703	739	721	818	862	840
11:02:00	532	38367	701	739	720	836	851	844
11:02:15	532	38352	701	738	719	839	866	853
11:02:30	532	38384	700	738	719	853	846	849
11:02:45	532	38363	700	737	719	839	850	845
11:03:00	532	38422	699	737	718	795	847	821
11:03:15	532	38377	696	737	716	809	867	838
11:03:30	531	38370	693	737	715	782	831	806
11:03:45	531	38404	691	736	713	829	869	849
11:04:00	531	38381	692	736	714	848	853	851
11:04:15	531	38352	693	736	714	816	868	842
11:04:30	541	38370	692	736	714	833	836	834
11:04:45	540	38369	693	736	714	848	884	866
11:05:00	539	38360	694	737	715	850	873	862
11:05:15	539	38362	694	737	716	838	884	861
11:05:30	539	38355	694	737	716	846	836	841
11:05:45	538	38398	696	734	715	862	818	840
11:06:00	538	38369	697	733	715	836	847	841
11:06:15	538	38379	697	733	715	829	897	863
11:06:30	537	38358	697	736	716	826	891	859
11:06:45	537	38354	697	737	717	839	863	851
11:07:00	537	38380	697	736	716	853	843	848
11:07:15	536	38372	698	734	716	861	866	863
11:07:30	536	38359	699	735	717	852	881	867
11:07:45	536	38363	700	736	718	851	895	873
11:08:00	536	38366	701	737	719	854	892	873
11:08:15	536	38369	702	738	720	857	907	882
11:08:30	536	38385	703	739	721	863	886	874
11:08:45	536	38382	703	739	721	851	887	869
11:09:00	535	38379	703	741	722	867	899	883
11:09:15	535	38392	704	741	723	852	871	861
11:09:30	535	38376	703	741	722	813	878	845

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Fire Test Data - continued

11:09:45	535	38353	701	741	721	828	871	849
11:10:00	535	38366	700	742	721	843	891	867
11:10:15	535	38363	698	739	719	664	647	656
11:10:30	534	38389	689	723	706	523	466	494
11:10:45	533	38332	666	696	681	258	73	166
11:11:00	533	38304	527	589	558	68	52	60
11:11:15	533	38299	382	482	432	71	35	53
11:11:30	533	38299	279	398	339	59	34	47
11:11:45	533	38315	202	291	246	42	28	35
11:12:00	532	38299	143	199	171	31	18	24
11:12:15	532	38301	103	139	121	24	16	20
11:12:30	532	38307	78	100	89	19	14	17
11:12:45	532	38296	62	76	69	17	14	15
11:13:00	532	38310	52	61	56	15	14	14
11:13:15	532	38303	44	51	48	13	14	14
11:13:30	532	38311	40	46	43	13	18	15
11:13:45	531	38309	37	46	41	12	16	14
11:14:00	531	38277	34	45	39	12	14	13
11:14:15	531	38306	32	43	38	12	15	13
11:14:30	531	38299	31	41	36	11	14	13
11:14:45	531	38296	30	39	35	11	13	12
11:15:00	531	38308	29	38	34	12	13	13
11:15:15	531	38288	29	37	33	13	14	14
11:15:30	530	38266	29	37	33	13	15	14
11:15:45	530	38277	29	36	33	14	16	15
11:16:00	530	38279	29	36	33	14	16	15
11:16:15	530	38280	29	37	33	14	17	16
11:16:30	530	38264	29	41	35	14	21	17
11:16:45	529	38230	30	43	37	14	25	19
11:17:00	529	38245	30	45	38	14	28	21
11:17:15	529	38211	30	46	38	14	33	24
11:17:30	528	38222	30	48	39	14	41	27
11:17:45	528	38174	31	50	40	14	44	29
11:18:00	527	38256	31	52	41	14	43	29
11:18:15	527	38213	31	53	42	14	46	30
11:18:30	527	38183	31	55	43	14	46	30
11:18:45	526	38078	31	56	44	15	45	30
11:19:00	526	38142	31	57	44	15	44	30
11:19:15	526	38104	31	58	44	15	43	29
11:19:30	526	38188	31	58	45	16	43	29
11:19:45	525	38089	31	59	45	16	42	29
11:20:00	529	37681	32	59	46	16	40	28

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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:	200	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:	562	mls
Water Collected in System Relief Valve:	500	mls
Calculated External Leakage During 40 Minute Duration:	62	mls
Average Leak Rate Over 40 Minute Duration:	1.6	ml/min
Allowable Leak Rate:	50	ml/min

Were the Valve Leakages Below the Allowables?	Yes
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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:	546	psig
Average Pressure During Burn/Cool Down:	536	psig
Minimum Pressure During Burn/Cool Down:	525	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:	731	deg. C
Average Cal Block Temperature:	501	deg. C
Lowest Avg Cal. Block Temperature:	33	deg. C
Maximum Body Flame Temperature During Burn:	912	deg. C
Average Body Flame Temperature During Burn:	825	deg. C
Maximum Bonnet Flame Temperature During Burn:	940	deg. C
Average Bonnet Flame Temperature During Burn:	857	deg. C
Average of Both Flame Temperatures During Burn:	841	deg. C

Note

Were Test Conditions Within Compliance?	Yes
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Yarmouth Research and Technology, LLC

Post-Burn Seat Test Information

Customer: EV Metalværk A/S

Date: 3/7/2016

Product Code: 0.5 inch Class 300 Monoflange instrument valve SDBB

Project Number: 215374

Test Data

Time	Pressure (psig)	Cal Block Temp - C
11:25:10	51	43
11:25:25	51	43
11:25:40	51	43
11:25:55	51	43
11:26:10	51	43
11:26:25	51	43
11:26:40	51	42
11:26:55	51	42
11:27:10	51	42
11:27:25	51	42
11:27:40	51	42
11:27:55	51	42
11:28:10	51	42
11:28:25	51	42
11:28:40	51	41
11:28:55	51	42
11:29:10	51	41
11:29:25	51	41
11:29:40	51	41
11:29:55	51	41
11:30:10	51	41

Total Seat Leakage Collected Over 5 Minute Duration:	0	mls
Average Leak Rate Over 5 Minute Duration:	0	ml/min
Allowable Leak Rate:	20	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:	10	ml/min

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

Yarmouth Research and Technology, LLC

Operational Test Information

Customer: EV Metalværk A/S

Date: 3/7/2016

Product Code: 0.5 inch Class 300 Monoflange instrument valve SDBB

Project Number: 215374

Test Data

Time	Pressure (psig)	Cal Block Temp - C
11:35:09	546	37
11:35:24	544	37
11:35:39	542	37
11:35:54	541	37
11:36:09	540	37
11:36:24	539	37
11:36:39	539	37
11:36:54	538	37
11:37:09	538	37
11:37:24	537	37
11:37:39	537	37
11:37:54	537	37
11:38:09	536	37
11:38:24	536	37
11:38:39	536	37
11:38:54	536	37
11:39:09	535	37
11:39:24	535	37
11:39:39	535	37
11:39:54	535	37
11:40:09	535	37

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
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