

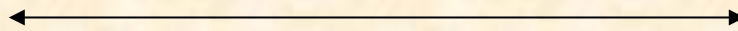
Fire Test Report

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 600

Monoflange Instrument Valve SDBB

Product Code: 10#600 1/2 RTJxNPT

Project Number: 215374

Test Date: December 8, 2015

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 Metalærk A/S

Date: 12/8/2015

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

Product Description: Monoflange instrument valve SDBB

Project Number: 215374

Product Code: 10#600 1/2 RTJxNPT

Equipment Confirmed to be in Calibration to NIST Standards: Yes

Burn and Cool Down Test

Burn Start Time:	15:16:00	
Average Pressure During Burn:	1087	psig
Seat Leak Rate During Burn:	0	ml/min
Allowable Seat Leak Rate:	200	ml/min
External Leak Rate During Burn/Cool Down:	0	ml/min
Allowable External Leak Rate:	50	ml/min
Amount of Time of Avg. Cal. Blocks > 650 deg. C:	22.8	minutes
Were Test Conditions Within Compliance?	Yes	
Were the Valve Leakages Below the Allowables?	Yes	

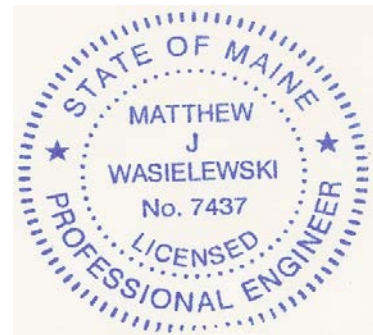
Operational Test

Did Valve Unseat and Open Fully?:	Yes	
Average Pressure During Test:	1124	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

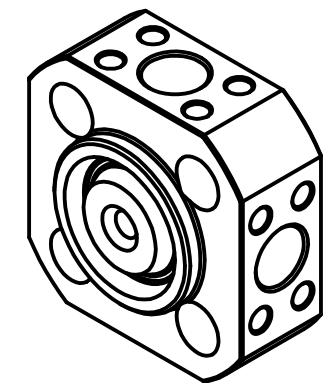
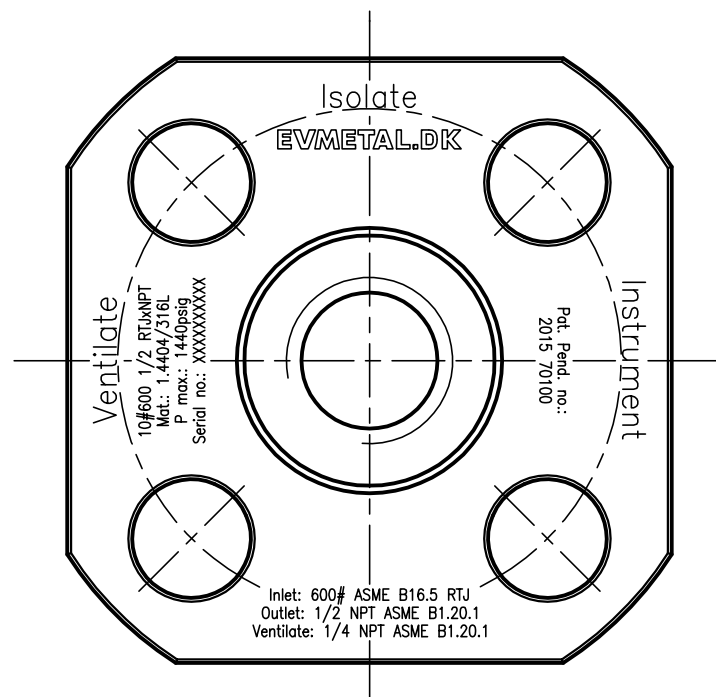


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
Fire Test Information Sheet

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#600 1/2 RTJxNPT
Valve Description	
Size:	1/2" - 2" (1/2" sent as test valve)
Pressure Rating/Class:	#2500 (#600 sent as test valve)
Pressure Rating at 100F (psig):	6250 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:	24-11-2015

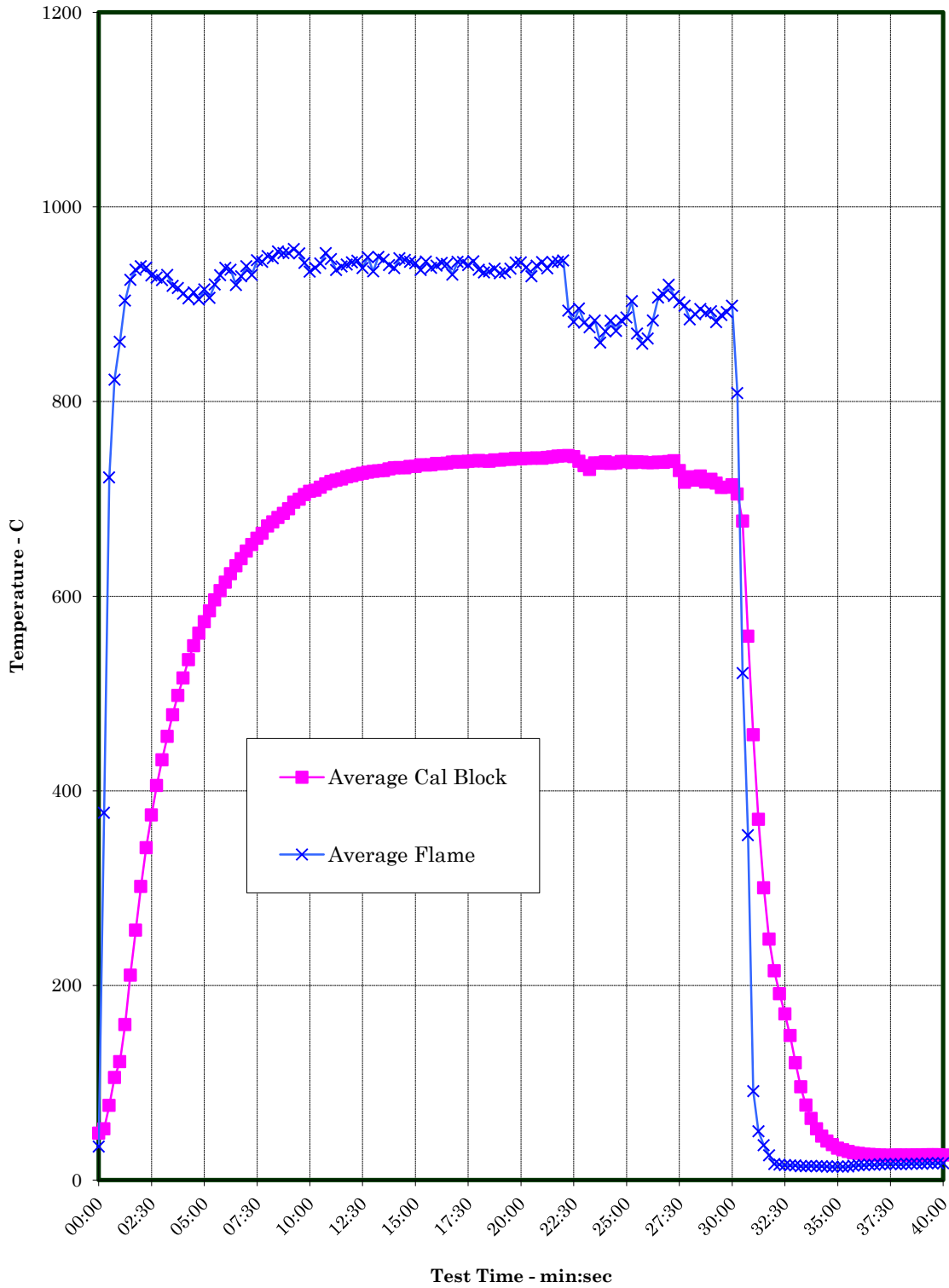
PLEASE RETURN AS AN EXCEL DOCUMENT



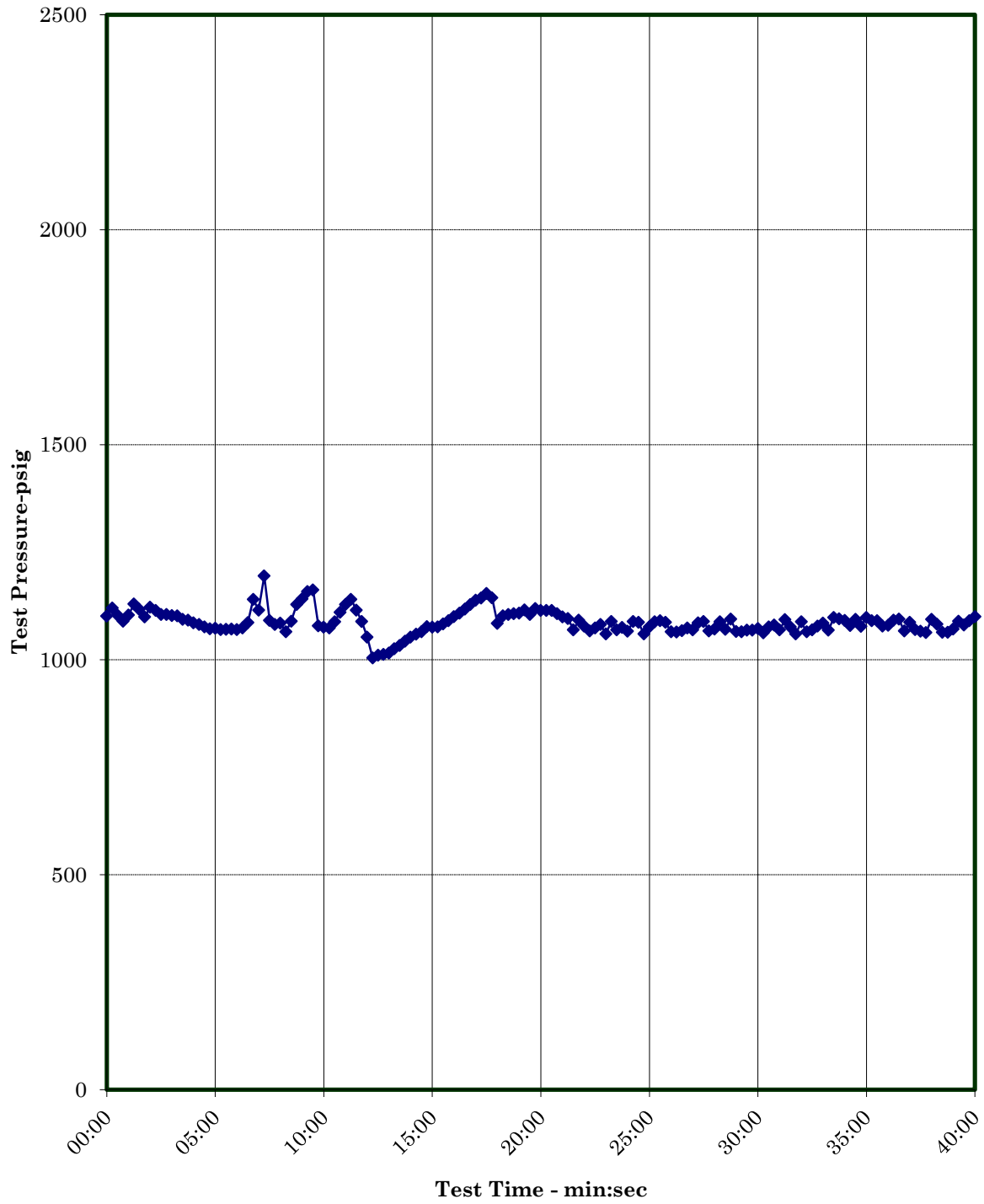
Bejdses i Gelbbrønderi efter lasermærkning. Procedure som AISI316L.
 Typehøjde af Isolate, Ventilate og Instrument 3 mm, Tekstfont Calibri fed
 Typehøjde af EVMETAL.DK 2.5 mm, øvrig tekst 1.5 mm. Tekstfont Calibri

 EV METALVÆRK A/S RIBOVEJ 1 DK-6950 RINGKØBING	Scale	Date	Drawn by	Material
	1:1	05.03.15	TN	AISI316L (W. Nr. 1.4404)
	A3	Post treatment	Weight	Dim.
	XX	XX	1.2 kg	Ø100
 Edges deburred. Dimensions without tolerance ±0.1 mm				
Designation			Dwg. no.	Kunde Nr. XXXXXX
Flangehus #600 1/2 RTJxNPT			10#600 1/2 RTJxNPT-0	
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.				

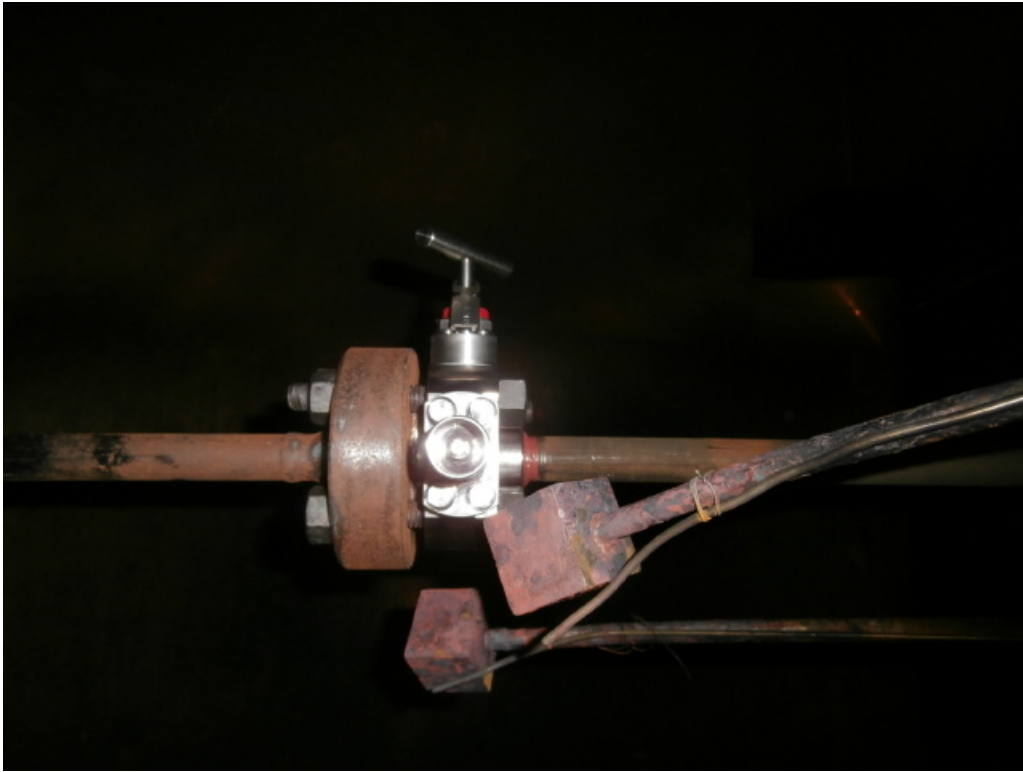
Temperature verses Time Chart



Pressure versus Time Chart



Yarmouth Research and Technology, LLC



Test Setup Prior to Burn



Test Valve During Burn

Yarmouth Research and Technology, LLC



Test Valve During Burn



Post-Burn Test Valve

Yarmouth Research and Technology, LLC

Fire Test Information

Customer: EV Metalærk A/S

Date: 12/8/2015

Product Code: 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
15:16:00	1102	39439	74	23	48	37	32	34
15:16:15	1120	39454	74	31	53	289	466	378
15:16:30	1103	39469	83	71	77	726	718	722
15:16:45	1090	39444	104	107	105	849	796	823
15:17:00	1104	39461	136	108	122	887	836	861
15:17:15	1129	39479	173	146	160	936	872	904
15:17:30	1117	39460	212	209	211	950	900	925
15:17:45	1100	39465	250	264	257	969	901	935
15:18:00	1122	39445	287	317	302	977	902	939
15:18:15	1114	39463	322	361	341	964	911	938
15:18:30	1105	39457	354	397	375	969	890	929
15:18:45	1105	39459	383	428	406	954	901	927
15:19:00	1102	39457	409	454	432	938	911	925
15:19:15	1102	39399	432	479	456	953	907	930
15:19:30	1094	39444	453	503	478	929	909	919
15:19:45	1092	39456	473	523	498	938	895	917
15:20:00	1086	39488	492	539	516	951	871	911
15:20:15	1082	39431	510	559	535	937	875	906
15:20:30	1076	39448	526	572	549	930	894	912
15:20:45	1072	39387	541	583	562	931	878	905
15:21:00	1073	39471	553	594	574	947	883	915
15:21:15	1070	39435	566	604	585	948	864	906
15:21:30	1071	39474	578	614	596	953	887	920
15:21:45	1071	39440	589	622	606	954	906	930
15:22:00	1070	39457	599	629	614	955	919	937
15:22:15	1074	39434	609	637	623	937	934	935
15:22:30	1086	39429	618	644	631	942	898	920
15:22:45	1141	39426	627	650	638	957	901	929
15:23:00	1115	39458	636	657	646	952	927	939
15:23:15	1195	39453	644	662	653	949	911	930
15:23:30	1091	39439	652	667	659	963	928	945
15:23:45	1082	39418	660	669	664	952	936	944
15:24:00	1085	39438	667	678	672	956	943	949

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Fire Test Data - continued

15:24:15	1065	39459	673	680	676	946	948	947
15:24:30	1090	39426	678	683	681	963	946	954
15:24:45	1128	39433	684	686	685	967	938	953
15:25:00	1141	39439	690	689	690	968	937	953
15:25:15	1158	39444	696	697	696	971	942	957
15:25:30	1162	39459	701	698	699	966	938	952
15:25:45	1079	39401	705	704	704	958	927	943
15:26:00	1076	39470	709	707	708	957	909	933
15:26:15	1074	39419	712	706	709	953	922	937
15:26:30	1088	39453	714	710	712	960	924	942
15:26:45	1110	39429	716	714	715	972	933	953
15:27:00	1129	39436	718	717	718	960	933	946
15:27:15	1140	39433	720	718	719	940	930	935
15:27:30	1115	39417	722	719	720	943	934	939
15:27:45	1089	39441	723	722	723	952	930	941
15:28:00	1052	39438	724	723	724	957	929	943
15:28:15	1004	39453	726	724	725	971	919	945
15:28:30	1010	39452	727	725	726	967	907	937
15:28:45	1012	39455	728	726	727	981	916	948
15:29:00	1016	39439	730	726	728	976	891	934
15:29:15	1025	39429	731	726	729	971	927	949
15:29:30	1033	39452	732	726	729	966	926	946
15:29:45	1043	39443	733	728	731	963	917	940
15:30:00	1053	39439	734	729	732	971	903	937
15:30:15	1059	39481	735	729	732	976	918	947
15:30:30	1065	39449	736	728	732	969	922	946
15:30:45	1077	39432	737	730	733	972	915	944
15:31:00	1075	39439	737	729	733	972	912	942
15:31:15	1076	39440	738	732	735	972	898	935
15:31:30	1083	39439	738	732	735	973	915	944
15:31:45	1090	39439	738	732	735	975	899	937
15:32:00	1100	39441	739	734	736	968	911	940
15:32:15	1108	39442	739	733	736	977	908	943
15:32:30	1118	39428	740	733	737	972	911	941
15:32:45	1128	39434	741	735	738	971	890	930
15:33:00	1138	39463	741	736	738	974	913	944
15:33:15	1144	39440	742	734	738	972	914	943
15:33:30	1154	39444	742	735	739	978	903	940
15:33:45	1144	39430	742	736	739	975	913	944
15:34:00	1084	39440	743	736	739	969	901	935
15:34:15	1102	39444	743	735	739	966	899	933
15:34:30	1105	39464	743	734	739	973	894	934
15:34:45	1107	39443	743	737	740	978	894	936

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Fire Test Data - continued

15:35:00	1108	39438	744	736	740	978	886	932
15:35:15	1116	39429	744	737	741	978	888	933
15:35:30	1105	39471	745	736	741	983	890	936
15:35:45	1119	39437	746	738	742	981	905	943
15:36:00	1115	39468	747	736	741	976	911	943
15:36:15	1115	39432	747	736	742	984	891	938
15:36:30	1115	39436	748	736	742	970	887	929
15:36:45	1107	39425	748	736	742	974	905	940
15:37:00	1099	39432	748	736	742	982	905	943
15:37:15	1096	39469	749	736	743	977	896	937
15:37:30	1069	39404	749	737	743	974	912	943
15:37:45	1092	39431	749	738	744	978	909	944
15:38:00	1078	39438	750	738	744	977	913	945
15:38:15	1067	39411	751	738	744	886	901	893
15:38:30	1074	39427	748	738	743	817	947	882
15:38:45	1082	39432	739	738	739	825	966	896
15:39:00	1060	39424	729	739	734	789	973	881
15:39:15	1089	39428	722	738	730	790	962	876
15:39:30	1069	39403	736	738	737	797	969	883
15:39:45	1075	39409	736	737	737	769	952	861
15:40:00	1066	39436	737	739	738	807	937	872
15:40:15	1089	39432	737	736	736	816	950	883
15:40:30	1087	39415	738	736	737	817	928	873
15:40:45	1060	39435	738	739	738	828	938	883
15:41:00	1077	39422	738	738	738	822	951	886
15:41:15	1088	39421	738	736	737	869	937	903
15:41:30	1091	39433	739	737	738	811	929	870
15:41:45	1087	39423	739	737	738	788	931	859
15:42:00	1065	39408	739	735	737	783	947	865
15:42:15	1065	39436	739	735	737	818	949	883
15:42:30	1067	39422	740	736	738	862	951	907
15:42:45	1074	39422	740	735	738	867	953	910
15:43:00	1070	39440	741	736	738	887	953	920
15:43:15	1086	39428	742	736	739	879	937	908
15:43:30	1089	39427	723	735	729	866	938	902
15:43:45	1067	39423	700	734	717	842	955	898
15:44:00	1071	39432	709	736	723	821	948	884
15:44:15	1088	39415	704	734	719	830	949	890
15:44:30	1071	39422	711	736	723	829	961	895
15:44:45	1094	39403	701	733	717	832	950	891
15:45:00	1065	39435	707	733	720	832	953	893
15:45:15	1065	39415	698	734	716	819	944	882
15:45:30	1068	39417	692	732	712	818	960	889

Yarmouth Research and Technology, LLC

Fire Test Data - continued

15:45:45	1068	39419	691	733	712	820	964	892
15:46:00	1073	39406	697	732	714	831	966	898
15:46:15	1063	39425	679	731	705	649	968	809
15:46:30	1076	39438	634	720	677	461	581	521
15:46:45	1081	39435	484	633	559	351	358	354
15:47:00	1069	39413	448	467	458	44	139	91
15:47:15	1093	39413	414	327	371	23	78	50
15:47:30	1076	39411	385	216	300	18	53	36
15:47:45	1060	39413	363	132	248	16	35	26
15:48:00	1088	39418	346	84	215	16	17	16
15:48:15	1065	39421	324	58	191	15	17	16
15:48:30	1069	39409	297	45	171	14	16	15
15:48:45	1078	39419	260	37	149	14	16	15
15:49:00	1085	39410	208	33	121	14	16	15
15:49:15	1069	39414	162	29	96	13	15	14
15:49:30	1098	39415	126	28	77	13	15	14
15:49:45	1095	39426	100	27	63	13	16	14
15:50:00	1092	39405	80	26	53	13	15	14
15:50:15	1079	39427	66	24	45	13	15	14
15:50:30	1094	39402	56	24	40	13	15	14
15:50:45	1078	39407	48	24	36	13	14	14
15:51:00	1098	39404	43	23	33	13	15	14
15:51:15	1091	39402	39	23	31	13	14	14
15:51:30	1091	39417	36	23	29	13	15	14
15:51:45	1078	39416	34	22	28	14	16	15
15:52:00	1080	39405	32	23	28	15	16	15
15:52:15	1092	39402	31	22	27	15	16	15
15:52:30	1094	39408	31	22	26	16	16	16
15:52:45	1067	39423	30	22	26	15	16	16
15:53:00	1087	39415	29	22	26	16	17	16
15:53:15	1070	39417	29	22	26	16	17	16
15:53:30	1066	39417	29	22	26	16	17	16
15:53:45	1063	39411	29	22	26	16	17	16
15:54:00	1094	39434	29	22	26	16	16	16
15:54:15	1083	39428	29	22	26	16	17	16
15:54:30	1064	39429	29	22	26	17	17	17
15:54:45	1064	39414	29	22	26	17	17	17
15:55:00	1071	39417	29	22	26	17	17	17
15:55:15	1090	39425	30	22	26	17	17	17
15:55:30	1081	39434	30	22	26	17	17	17
15:55:45	1091	39418	30	22	26	18	17	17
15:56:00	1100	39439	30	22	26	18	17	17

Yarmouth Research and Technology, LLC

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:	0	mls
Water Collected in System Relief Valve:	0	mls
Calculated External Leakage During 40 Minute Duration:	0	mls
Average Leak Rate Over 40 Minute Duration:	0.0	ml/min
Allowable Leak Rate:	50	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:	1195	psig
Average Pressure During Burn/Cool Down:	1087	psig
Minimum Pressure During Burn/Cool Down:	1004	psig
Amount of Time of Avg. Cal Block > 650 deg.C:	22.8	minutes
Minimum Allowable Time at Temperature:	15.0	minutes
Maximum Avg Cal Block Temperature:	744	deg. C
Average Cal Block Temperature:	521	deg. C
Lowest Avg Cal. Block Temperature:	26	deg. C
Maximum Body Flame Temperature During Burn:	973	deg. C
Average Body Flame Temperature During Burn:	911	deg. C
Maximum Bonnet Flame Temperature During Burn:	984	deg. C
Average Bonnet Flame Temperature During Burn:	912	deg. C
Average of Both Flame Temperatures During Burn:	911	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 Metalærk A/S

Date: 12/8/2015

Product Code: Monoflange instrument valve SDBB

Project Number: 215374

Test Data

Time	Pressure (psig)	Cal Block Temp - C
16:23:41	117	32
16:23:56	101	32
16:24:11	109	32
16:24:26	115	32
16:24:41	109	32
16:24:56	111	32
16:25:11	120	32
16:25:26	114	32
16:25:41	119	32
16:25:56	111	32
16:26:11	105	32
16:26:26	110	32
16:26:41	107	32
16:26:56	114	32
16:27:11	110	32
16:27:26	111	32
16:27:41	111	32
16:27:56	117	32
16:28:11	113	32
16:28:26	111	32
16:28:41	111	32

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 Metalærk A/S

Date: 12/8/2015

Product Code: Monoflange instrument valve SDBB

Project Number: 215374

Test Data

Time	Pressure (psig)	Cal Block Temp - C
16:29:12	1099	32
16:29:27	1112	32
16:29:42	1122	32
16:29:57	1135	32
16:30:12	1153	32
16:30:27	1139	32
16:30:42	1129	32
16:30:57	1117	32
16:31:12	1127	32
16:31:27	1134	32
16:31:42	1103	32
16:31:57	1108	32
16:32:12	1120	32
16:32:27	1128	32
16:32:42	1124	32
16:32:57	1125	32
16:33:12	1131	32
16:33:27	1127	32
16:33:42	1125	32
16:33:57	1128	32
16:34:12	1126	32

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
--------------------------------------------	-----