

Fire Test Report

ANSI/API Standard 607, Sixth Edition, 2010

ISO 10497:2010

Performed for

TEADIT North America, Inc.

www.TEADIT.com



Style GAX 2235 Packing

Tested in a 4 inch Class 300 Gate Valve

Project Number: 211212

November 3, 2011



Performed by

YARMOUTH RESEARCH AND TECHNOLOGY, LLC

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Yarmouth Research and Technology, LLC

Customer: Teadit

Date: 11/3/2011

Specification: ANSI/API Standard 607, Sixth Edition, 2010
ISO 10497-5:2010

Product Description: Style GAX 2235 Packing

Project Number: PN211212

Comments: Tested in a 4 inch Class 300 Gate Valve

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:	10:29:00	
Average Pressure During Burn:	559	psig
External Leak Rate During Burn/Cool Down:	0.0	ml/min
Allowable External Leak Rate:	600	ml/min
Amount of Time of Avg. Cal. Blocks > 650 deg. C:	16.0	minutes
Were Test Conditions Within Compliance?	Yes	
Were the Valve Leakages Below the Allowables?	Yes	

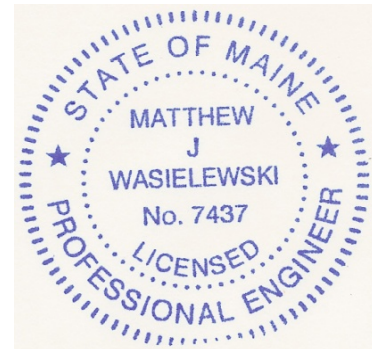
Operational Test

Did Valve Unseat and Open Fully?:	Yes	
Average Pressure During Test:	561	psig
External Leak Rate After Operating:	0	ml/min
Allowable External Leak Rate:	150	ml/min
Was the Leakage Below the Allowable?	Yes	

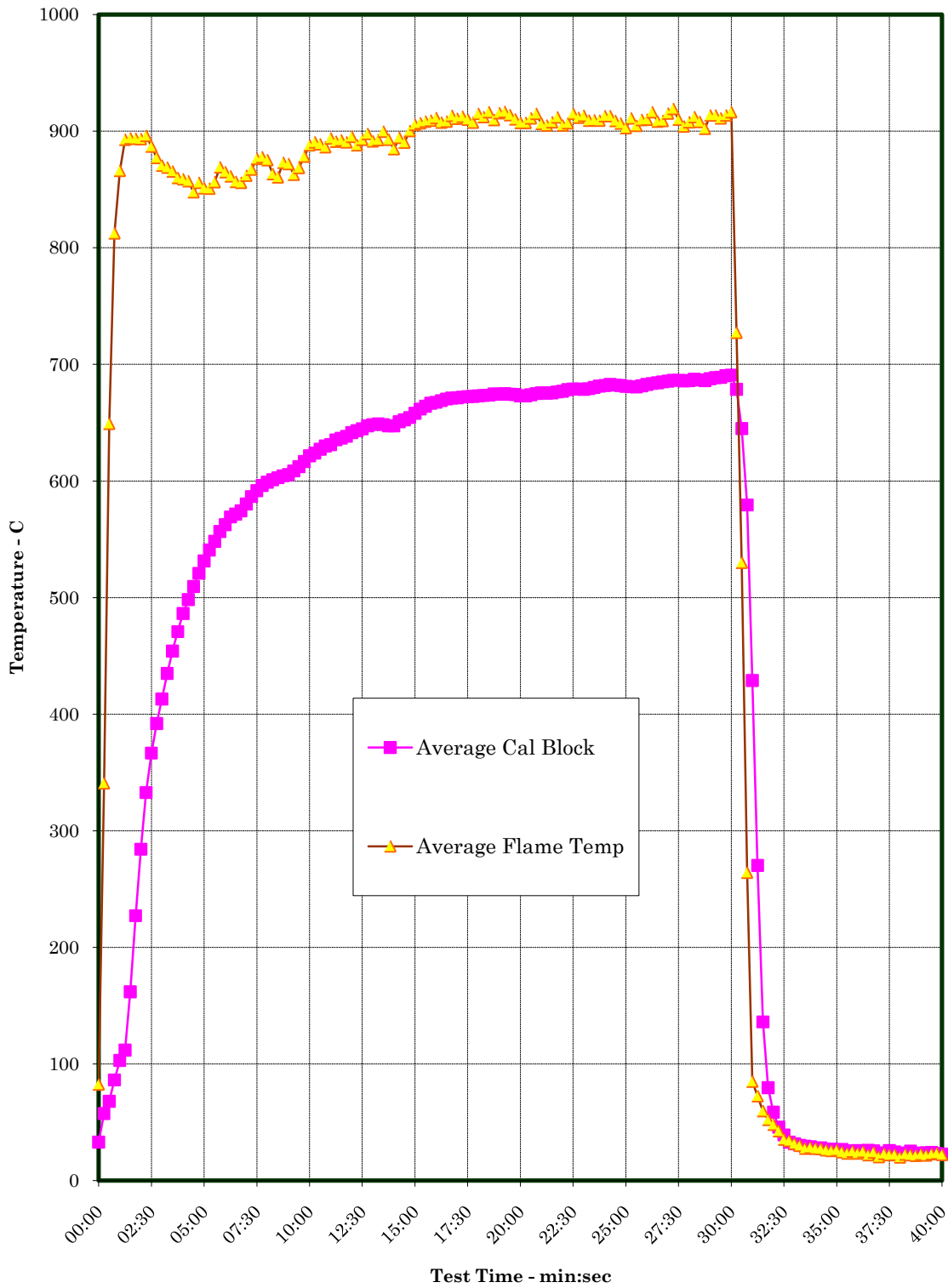
Valve Pass or Fail the Test Standard?	PASS
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Witnesses

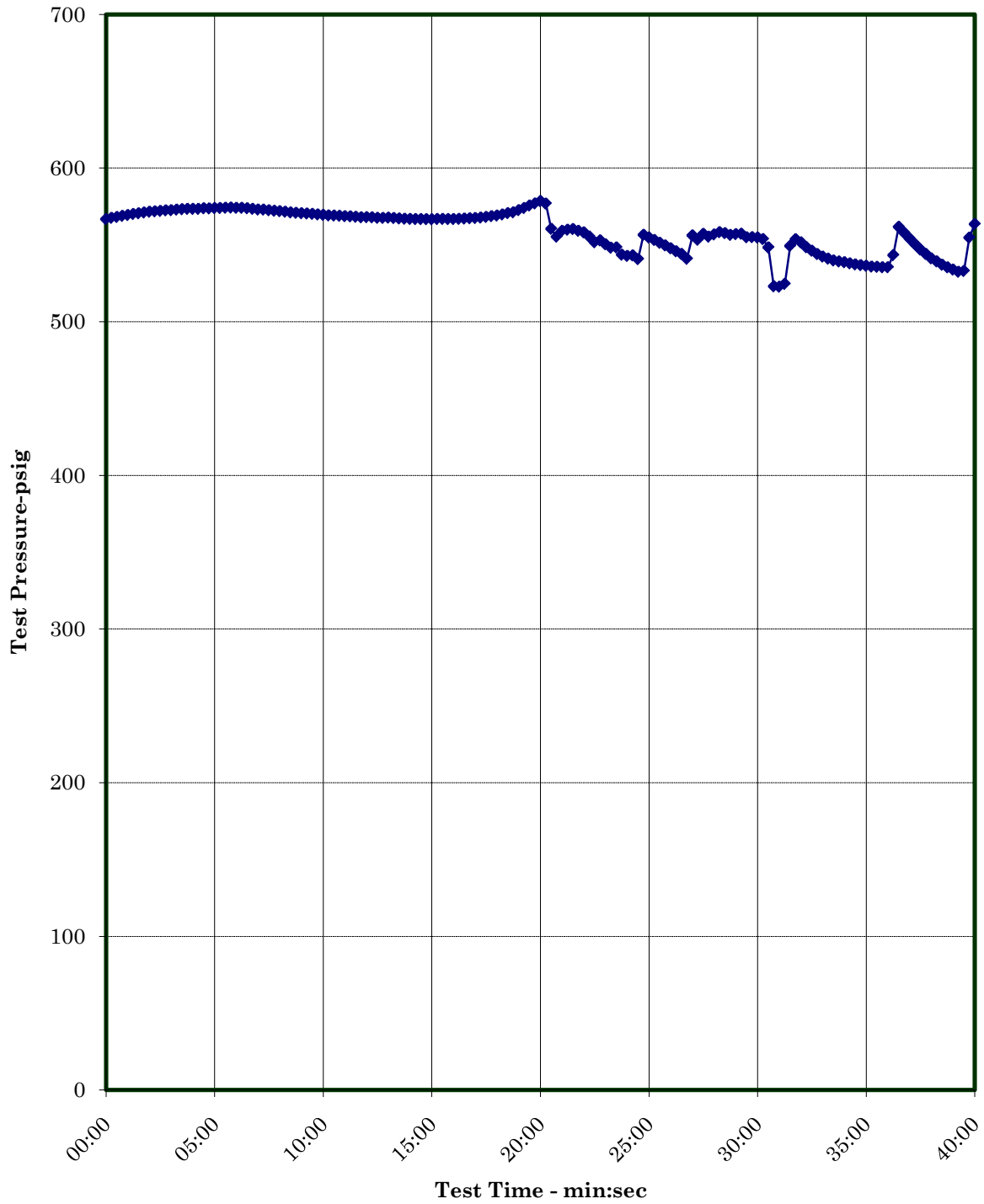
Matthew J. Wasielewski



Temperature verses Time Chart



Pressure versus Time Chart



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Packing Prior to Test



Valve During Burn

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Fire Test Information

Customer: Teadit

Date: 11/3/2011

Product Code: Style GAX 2235 Packing

Project Number: PN211212

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
10:29:00	567	35729	24	42	33	64	101	83
10:29:15	568	35742	24	91	58	371	311	341
10:29:30	568	35733	34	102	68	714	584	649
10:29:45	569	35727	70	103	86	897	728	813
10:30:00	569	35736	105	101	103	935	797	866
10:30:15	570	35733	122	102	112	949	836	893
10:30:30	571	35741	155	169	162	937	851	894
10:30:45	571	35738	194	260	227	937	850	894
10:31:00	572	35751	231	337	284	928	858	893
10:31:15	572	35746	264	402	333	928	864	896
10:31:30	572	35752	290	443	367	915	859	887
10:31:45	572	35767	316	468	392	908	847	877
10:32:00	573	35761	339	487	413	901	841	871
10:32:15	573	35774	362	508	435	895	843	869
10:32:30	573	35774	383	526	454	896	835	866
10:32:45	573	35792	403	538	471	897	823	860
10:33:00	573	35803	424	548	486	902	816	859
10:33:15	573	35791	442	555	498	893	821	857
10:33:30	574	35825	459	560	509	886	809	848
10:33:45	574	35828	475	567	521	892	820	856
10:34:00	574	35826	489	573	531	878	824	851
10:34:15	574	35845	503	578	541	882	819	851
10:34:30	574	35850	516	581	548	888	825	856
10:34:45	574	35860	528	585	557	898	840	869
10:35:00	574	35864	539	586	563	888	842	865
10:35:15	574	35882	548	590	569	876	847	861
10:35:30	574	35896	557	586	572	886	828	857
10:35:45	573	35915	566	583	574	892	819	856
10:36:00	573	35930	573	587	580	894	829	862
10:36:15	573	35940	581	592	587	899	836	867
10:36:30	573	35978	587	596	592	913	840	876
10:36:45	572	35970	593	599	596	907	848	878
10:37:00	572	35991	599	598	599	910	841	875

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Fire Test Data - continued

10:37:15	572	35996	604	598	601	897	829	863
10:37:30	571	36015	609	596	603	901	820	861
10:37:45	571	36055	614	595	604	912	834	873
10:38:00	571	36054	619	592	606	910	834	872
10:38:15	570	36087	623	594	609	907	819	863
10:38:30	570	36103	628	597	612	917	820	869
10:38:45	570	36105	633	601	617	923	834	878
10:39:00	570	36174	638	605	622	930	846	888
10:39:15	569	36205	643	605	624	933	848	891
10:39:30	569	36204	648	607	627	940	838	889
10:39:45	569	36186	652	608	630	937	836	886
10:40:00	569	36221	657	606	631	942	846	894
10:40:15	569	36242	661	610	635	940	842	891
10:40:30	568	36247	664	609	637	946	838	892
10:40:45	568	36271	668	608	638	947	834	891
10:41:00	568	36300	672	611	641	945	846	895
10:41:15	568	36314	676	610	643	948	828	888
10:41:30	568	36339	679	611	645	956	830	893
10:41:45	568	36367	682	612	647	957	838	898
10:42:00	568	36377	685	612	648	948	834	891
10:42:15	568	36405	688	609	649	954	831	893
10:42:30	567	36414	691	606	648	962	837	900
10:42:45	567	36457	693	601	647	959	827	893
10:43:00	567	36462	696	599	647	942	828	885
10:43:15	567	36507	698	604	651	938	851	894
10:43:30	567	36549	700	605	653	959	821	890
10:43:45	567	36549	702	607	654	959	842	900
10:44:00	567	36580	704	612	658	964	847	906
10:44:15	567	36625	706	617	662	968	846	907
10:44:30	567	36664	708	621	664	964	853	908
10:44:45	567	36693	709	624	667	963	855	909
10:45:00	567	36732	711	624	668	972	851	911
10:45:15	567	36750	712	626	669	965	850	908
10:45:30	567	36800	713	628	670	975	842	908
10:45:45	567	36836	714	628	671	983	844	913
10:46:00	567	36892	714	628	671	967	855	911
10:46:15	568	36968	716	628	672	973	852	913
10:46:30	568	37011	717	628	672	967	853	910
10:46:45	569	37082	718	627	673	972	843	908
10:47:00	569	37139	718	628	673	981	849	915
10:47:15	570	37220	718	628	673	969	856	912
10:47:30	571	37350	719	628	674	979	854	916
10:47:45	571	37411	719	630	675	977	842	910

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Fire Test Data - continued

10:48:00	573	37556	719	629	674	979	852	916
10:48:15	574	37684	721	629	675	980	853	917
10:48:30	576	37847	721	628	674	979	848	914
10:48:45	577	38101	722	627	674	985	836	910
10:49:00	579	38280	722	624	673	982	833	907
10:49:15	577	38586	722	624	673	987	828	907
10:49:30	560	39262	722	626	674	979	843	911
10:49:45	555	39813	723	627	675	974	856	915
10:50:00	559	40056	723	628	676	961	852	906
10:50:15	560	39859	724	627	675	964	846	905
10:50:30	560	41382	725	626	676	972	843	908
10:50:45	559	40651	725	628	676	969	854	912
10:51:00	558	42208	726	628	677	962	848	905
10:51:15	555	42485	726	631	678	963	851	907
10:51:30	552	39714	727	631	679	977	853	915
10:51:45	553	41001	727	631	679	972	852	912
10:52:00	550	42679	727	630	679	972	854	913
10:52:15	548	39366	728	631	679	964	854	909
10:52:30	548	43030	728	632	680	961	858	909
10:52:45	544	41255	729	634	681	952	866	909
10:53:00	543	39443	729	634	682	947	879	913
10:53:15	543	42722	731	635	683	961	866	913
10:53:30	541	43131	731	634	682	952	866	909
10:53:45	557	40323	732	632	682	969	844	907
10:54:00	555	40690	732	630	681	951	855	903
10:54:15	553	42094	733	629	681	967	855	911
10:54:30	551	43174	733	628	681	960	849	905
10:54:45	550	43661	733	630	682	960	859	910
10:55:00	548	43759	734	632	683	957	863	910
10:55:15	546	43406	734	633	684	956	877	916
10:55:30	544	42298	734	634	684	943	874	908
10:55:45	541	40186	736	634	685	943	874	909
10:56:00	556	43729	736	636	686	947	884	915
10:56:15	553	40749	736	637	686	968	870	919
10:56:30	557	43418	736	637	686	952	868	910
10:56:45	555	42412	737	634	686	951	857	904
10:57:00	557	40526	737	635	686	942	873	908
10:57:15	558	43627	738	637	687	941	884	912
10:57:30	558	43929	738	635	687	951	866	908
10:57:45	556	43085	738	634	686	929	876	902
10:58:00	557	43732	739	637	688	941	886	914
10:58:15	557	43769	739	638	689	944	883	914
10:58:30	555	40727	739	638	689	939	883	911

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Fire Test Data - continued

10:58:45	555	43421	740	641	690	944	883	914
10:59:00	555	42108	741	641	691	946	887	916
10:59:15	554	43482	741	617	679	725	729	727
10:59:30	548	41813	735	555	645	502	558	530
10:59:45	523	37585	711	448	579	111	417	264
11:00:00	523	37525	642	216	429	92	78	85
11:00:15	525	37239	413	127	270	72	73	73
11:00:30	549	37113	178	94	136	57	63	60
11:00:45	554	36981	89	71	80	49	55	52
11:01:00	552	36897	54	63	59	42	54	48
11:01:15	548	36789	40	52	46	37	48	43
11:01:30	546	36692	33	45	39	32	39	35
11:01:45	544	36611	29	37	33	31	38	34
11:02:00	542	36522	27	37	32	28	35	32
11:02:15	541	36461	26	35	30	27	33	30
11:02:30	540	36408	25	34	29	26	29	28
11:02:45	539	36359	24	34	29	25	32	28
11:03:00	539	36318	24	32	28	24	31	28
11:03:15	538	36274	24	32	28	24	30	27
11:03:30	537	36235	23	30	27	24	28	26
11:03:45	537	36190	23	31	27	23	28	26
11:04:00	536	36188	23	30	26	24	28	26
11:04:15	536	36151	23	30	27	23	26	24
11:04:30	536	36140	22	29	26	22	25	23
11:04:45	535	36129	22	28	25	23	27	25
11:05:00	535	36085	23	29	26	22	24	23
11:05:15	543	35921	22	28	25	22	28	25
11:05:30	562	35972	22	31	26	21	23	22
11:05:45	558	35927	22	29	26	21	27	24
11:06:00	554	35920	22	26	24	21	20	20
11:06:15	550	35907	22	25	24	21	26	23
11:06:30	547	35887	21	31	26	19	24	22
11:06:45	544	35890	22	28	25	21	24	22
11:07:00	541	35899	21	26	23	19	21	20
11:07:15	539	35852	21	26	24	19	26	23
11:07:30	537	35824	21	29	25	21	23	22
11:07:45	535	35800	21	26	24	20	23	21
11:08:00	534	35775	21	26	23	19	26	23
11:08:15	532	35748	21	27	24	19	24	22
11:08:30	533	35730	22	27	24	23	23	23
11:08:45	555	35728	22	25	23	22	24	23
11:09:00	564	35731	22	24	23	22	23	22

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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.

System relief water:	0	mls
Total Water Volume Lost Over 40 Minute Burn and Cool Down:	-2	mls
Water Collected in System Relief Valve:	0	mls
Calculated External Leakage During 40 Minute Duration:	-2	mls
Average Leak Rate Over 40 Minute Duration:	0.0	ml/min
Allowable Leak Rate:	600	ml/min

Were the Valve Leakages Below the Allowables?	Yes
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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:	578.5	psig
Average Pressure During Burn/Cool Down:	559.2	psig
Minimum Pressure During Burn/Cool Down:	522.7	psig
Amount of Time of Avg. Cal Block > 650 deg.C:	16.0	minutes
Minimum Allowable Time at Temperature:	15.0	minutes
Maximum Avg Cal Block Temperature:	690.8	deg. C
Average Cal Block Temperature:	469.6	deg. C
Lowest Avg Cal. Block Temperature:	22.8	deg. C
Maximum Body Flame Temperature During Burn:	887.2	deg. C
Average Body Flame Temperature During Burn:	835.9	deg. C
Maximum Bonnet Flame Temperature During Burn:	986.7	deg. C
Average Bonnet Flame Temperature During Burn:	930.0	deg. C
Average of Both Flame Temperatures During Burn:	883.0	deg. C

Note

Average flame temperature should average between 1400-1800 deg.
with neither flame dropping below 1300.

In most cases, flame temperatures need to be increased above 1800 in order
to satisfy the body and bonnet metal temperatures, which take priority

Were Test Conditions Within Compliance?	Yes
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Operational Test Information

Customer: Teadit

Date: 11/3/2011

Product Code: Style GAX 2235 Packing

Project Number: PN211212

Valve stroked 1 time prior to leakage test.

Test Data

Time	Pressure (psig)	Cal Block Temp - C
11:12:30	557	26
11:12:45	556	26
11:13:00	557	26
11:13:15	557	27
11:13:30	557	23
11:13:45	558	25
11:14:00	559	27
11:14:15	559	26
11:14:30	560	26
11:14:45	561	24
11:15:00	561	24
11:15:15	562	26
11:15:30	563	26
11:15:45	564	26
11:16:00	564	26
11:16:15	565	28
11:16:30	565	26
11:16:45	566	27
11:17:00	566	27
11:17:15	567	26
11:17:30	567	26

Leakages were collected manually.

Total External Leakage Collected Over 5 Minute Duration:	0	mls
Average Leak Rate Over 5 Minute Duration:	0.0	ml/min
Allowable Leak Rate:	150	ml/min

Was the Valve Leakage Below the Allowable?	Yes
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