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Email : pvt@plasvac.com
Website : www.plasvac.com

Certificate No : 607-202405071 **Date :** May 7, 2024

FIRE TYPE TEST CERTIFICATE as per API 607

Fire Test for Quarter-Turn Valves and Valves equipped with Non-Metallic Seats

This is to certify that the below mentioned valve has been inspected by Plasma & Vacuum Technologies and found to be satisfactory in accordance with the requirements of API 607, Eighth Edition 2022.

Manufacturer:	**Fluid-O-Mech Control's Inc.**
Address:	**Plot No. 14/1A, Pancharatna Ind. Estate, Vatva GIDC Phase-IV,Ahmedabad-382445, Gujarat, India.**
Location of Test:	Plasma and Vacuum Technologies, Plot No.17, Road 1-A, GIDC Kathwada, Ahmedabad 382430, India.

Valve Description :	**2 PC Ball Valve, 2" 150# F/E**
Seat Material :	**RPTFE**
Body / Side Piece Material :	**ASTM A 216 Gr. WCB**
Fastener Material :	**SS 304**
Ball Material :	**ASTM A 351 Gr. CF8 / SS 304**
Stem Material :	**AISI SS 304**
Packing Material :	**RPTFE**
Valve Weight :	**7 kg**
Test Fluid:	**Water**
Reduced or Full Bore:	**Full Bore**
GA Drawing Number :	**FMC/FBLV/50,100,200 X 150#/FE/00**
Test Pressure :	**a) 2 barG (~30 PSIG) During Burn Period & Operational Test b) 2 barG at Low Test Pressure after Cool Down**
Test Temperature :	**750 to 1000°C (~ 1400°F to 1800°F)**
Test Result :	**PASS**
Test Report No :	**PVT/SD/FET/R/202405/13**
Test Date:	**May 7, 2024**

Valve Qualified : All Valves of the same basic design, as the tested valve, may be deemed to be fire tested, subject to the following limitations. The Type Test of 2" 150# Class Valve, qualifies all small sizes to 2" and larger size up to 4" in pressure class 150and 300.

Test Conducted by **Venkat N. Ramani** **ASNT Level III (LT) 183918** **Plasma & Vacuum Technologies**	**Test Witnessed by** Witnessed. 07/05/2024 Shavals

ASNT NDT LEVEL III LT 183918

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FIRE TYPE TEST REPORT

F/CR/10.8
Rev No.00

Report No :	PVT/SD/FET/R/202405/13	Report Date :	May 7, 2024
Manufacturer :	Fluid-O-Mech Control's Inc.	Valve Stem Type :	Quarter-Turn
Valve – Type, Size, Class :	2 PC Ball Valve, 2" 150# F/E	API / ASME Design Standard:	BS EN ISO 17292 / API 6D
Gland Packing:	RPTFE	Seat Type:	RPTFE (Soft seated)
Test Date :	07/05/2024	Start Time: 10 : 0 Hrs	Symmetric / Asymmetric: Symmetric
		End Time : 11 : 0 Hrs	Gearbox Attached : Lever Operated.

Manufacturer's reported Maximum allowable body cavity pressure: 19.6 barG

Did Valve Passed all Required Test? Yes.

Valve Burn - Cool Down

Burn Start Time:	10	:	0	Hrs
Burn End Time:	10	:	30	Hrs
Test Pressure maintained during Burn and Cool Down:	2.05			barG
Through Seat Leakage Rate during Burn Period:	41.67			ml/min
Acceptable Through Seat Leakage Rate during Burn Period:	**200**			ml/min
External Leakage Rate during Burn and Cool Down:	0.29			ml/min
Acceptable External Leakage Rate Burn and Cool Down:	**50**			ml/min
Time Taken to Cool Down below 100°C:	5			minutes
Through Seat Leakage during Low Pressure Test after Cool Down:	30.00			ml/min
Acceptable Through Seat Leakage during Low Pressure Test After Cool Down:	**80**			ml/min

Valve Operation Test

Did the Valve Opened Fully?	**Yes**	
Average Pressure Maintained:	2.05	barG
External Leak Rate after Operating over 5-Minutes Duration:	18.00	ml/min
Acceptable External Leak Rate after Operation:	**50**	ml/min

Valve Serial No : **FMCI 01**

Whether the Test Valve complied with the requirements of this Standard? Yes.

FINAL REMARK : **Pass (√)**

Test Witnessed by	Test Conducted by	Test Witnessed by
Fluid-O-Mech Control's Inc.	Venkat N. Ramani ASNT Level III (LT) Plasma&Vacuum Technologies	

ASNT NDT LEVEL III LT 103818

MERITA (INDIA) PRIVATE LIMITED SURVEYOR AT AHMEDABAD

07-05-2024

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Annexure 1: MEASUREMENTS & CALCULATIONS

1. Burn & Cool Down				
1.1	Scale of measurement - 1mm Water Column Level in Vessel	A	90	mL
1.2	Water Level in the Vessel at Starting of the Test	R1	**15**	mm
1.3	Water Collected in the Container during 30 mins burn period	Q1	**1250**	mL
1.4	Water level in Vessel after burning and cool down period	R2	**29**	mm
1.5	Burning duration	T1	30	min
1.6	Cool down duration	T2	5	min
2. Low Pressure Test				
2.1	Water level in Vessel at starting of low-pressure test	R3	29	mm
2.2	Water level in Vessel after completion of 5min. of low-pressure test	R4	31	mm
2.3	Water collected in calibrated container during 5min	Q2	**150**	mL
2.4	Low Pressure Test duration	T3	5	min
3. Operational Test				
3.1	Water level at starting operational test:	R5	31	mm
3.2	Water level after completion of 5min. operational test:	R6	**32**	mm
3.3	Operational Test duration	T4	5	min

4. Calculations

A	Through valve seat leakage during burning period	Q1 / T1	**41.67**	mL/min
B	External Leakage during Burn & Cool Down Period	[{A x (R2-R1)} -Q1]/ (T1+T2)	**0.29**	mL/min
C	Through valve seat leakage during low test pressure test,after cool down	Q2 / T3	**30.00**	mL/min
D	External leakage during operational test	A x (R6-R5) / T4	**18.00**	mL/min

Test Witnessed by	Test Conducted by	Test Witnessed by
Fluid-O-Mech Control's Inc.	**Venkat N. Ramani** **ASNT Level III (LT)** **Plasma&Vacuum Technologies**	07/05/2021 Shalal-S

ASNT NDT LEVEL III LT 103918

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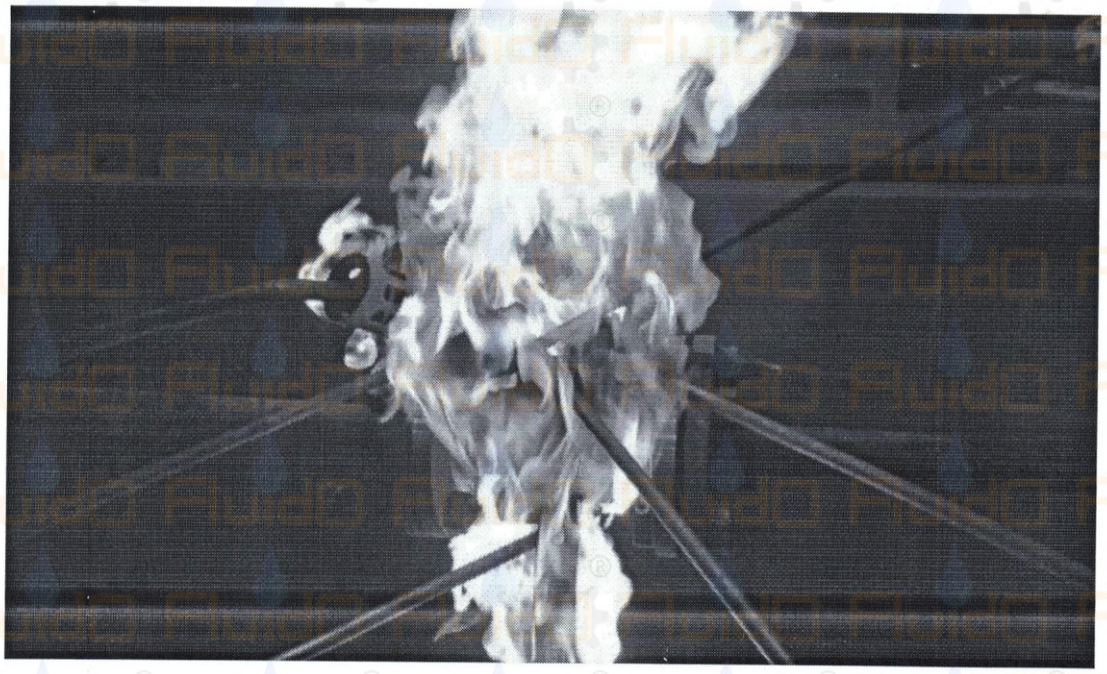
Annexure 2: FIRE SAFE TEST SET UP

Manufacturer : Fluid-O-Mech Control's Inc. Date: 07/05/24

Valve : 2 PC Ball Valve, 2" 150# F/E



ASNT NDT LEVEL III LT 103913

BUREAU VERITAS (INDIA) PRIVATE LIMITED SURVEYOR AT AHMEDABAD

07/05/2024

Shaikh S

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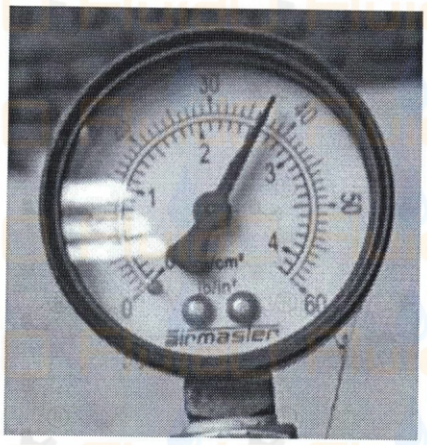
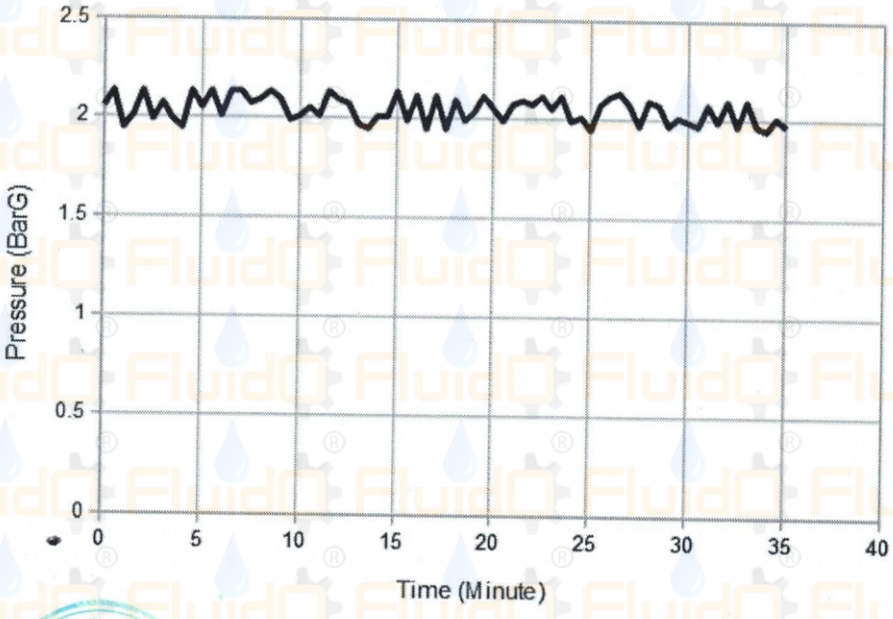
Annexure 3 : PRESSURE PROFILE

Manufacturer : Fluid-O-Mech Control's Inc. Date : 07/05/24

Valve : 2 PC Ball Valve, 2" 150# F/E





ASNT NDT LEVEL III LT 156912

SURVEYOR AT AHMEDABAD

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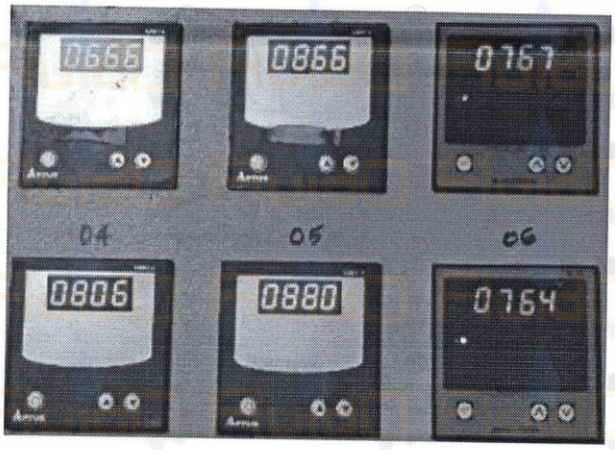
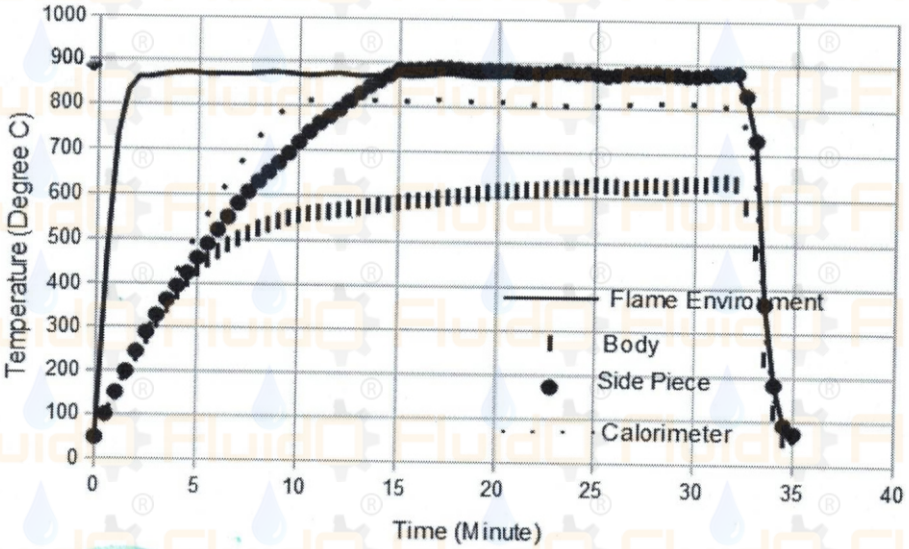
Annexure 4 : TEMPERATURE PROFILE

Manufacturer : Fluid-O-Mech Control's Inc.
Valve : 2 PC Ball Valve, 2" 150# F/E

Date : 07/05/24





ASNT NOT LEVEL III LT 105918

SURVEYOR AT AHMEDABAD
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Annexure 5
FIRE TEST DATA SHEET 1 of 2

Manufacturer : Fluid-O-Mech Control's Inc. **Date:** 07/05/2024

Valve : 2 PC Ball Valve, 2" 150# F/E

Time				Pressure (barG)	Temperature Readings (°C)							
					Flame Environment			Body	End Piece	Calorimeter Cube		
Hr	Min	Sec			F 1	F 2	Average			C 1	C 2	Average
10	0	0		2.1	49	49	49	48	49	49	50	49.5
10	0	30		2.1	468	466	467.0	100	101	101	101	101.0
10	1	0		1.9	736	732	734.0	149	151	151	150	150.5
10	1	30		2.0	835	829	832.0	195	199	199	197	198.0
10	2	0		2.1	865	857	861.0	238	245	245	242	243.5
10	2	30		2.0	865	857	861.0	278	289	289	285	287.0
10	3	0		2.1	869	861	865.0	315	328	335	330	332.5
10	3	30		2.0	872	865	868.5	349	363	382	377	379.5
10	4	0		1.9	874	868	871.0	380	395	429	425	427.0
10	4	30		2.1	875	870	872.5	408	425	475	473	474.0
10	5	0		2.1	870	871	870.5	433	459	514	520	517.0
10	5	30		2.1	871	866	868.5	455	491	552	560	556.0
10	6	0		2.0	871	867	869.0	474	522	588	599	593.5
10	6	30		2.1	872	867	869.5	490	551	623	636	629.5
10	7	0		2.1	870	868	869.0	503	581	654	672	663.0
10	7	30		2.1	873	866	869.5	515	607	686	704	695.0
10	8	0		2.1	875	869	872.0	526	630	718	737	727.5
10	8	30		2.1	876	871	873.5	535	651	746	767	756.5
10	9	0		2.1	875	872	873.5	543	672	768	793	780.5
10	9	30		2.0	873	871	872.0	550	694	783	813	798.0
10	10	0		2.0	870	869	869.5	556	718	790	826	808.0
10	10	30		2.1	870	866	868.0	560	741	792	831	811.5
10	11	0		2.0	872	866	869.0	563	761	794	831	812.5
10	11	30		2.1	876	868	872.0	565	776	798	833	815.5
10	12	0		2.1	874	872	873.0	569	792	796	837	816.5
10	12	30		2.1	870	870	870.0	572	811	792	835	813.5
10	13	0		2.0	870	866	868.0	574	829	792	831	811.5
10	13	30		1.9	871	866	868.5	578	845	793	831	812.0
10	14	0		2.0	874	867	870.5	581	857	796	832	814.0
10	14	30		2.0	873	870	871.5	583	869	795	835	815.0
10	15	0		2.1	870	869	869.5	587	883	792	834	813.0
10	15	30		2.0	870	866	868.0	590	883	789	834	811.5
10	16	0		2.1	871	866	868.5	592	884	789	835	812.0
10	16	30		1.9	873	867	870.0	593	886	790	837	813.5
10	17	0		2.1	876	869	872.5	597	889	792	840	816.0
10	17	30		1.9	875	872	873.5	600	888	795	839	817.0
10	18	0		2.1	873	871	872.0	602	886	794	837	815.5
10	18	30		2.0	870	869	869.5	606	883	792	834	813.0
10	19	0		2.0	870	866	868.0	609	883	789	834	811.5
10	19	30		2.1	871	866	868.5	611	884	789	835	812.0
10	20	0		2.1	870	867	868.5	615	883	790	834	812.0

ASNT NDT LEVEL III LT 166918

07/05/2024

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Annexure 5
FIRE TEST DATA SHEET 2 of 2

Manufacturer : Fluid-O-Mech Control's Inc. **Date:** 07/05/2024

Valve : 2 PC Ball Valve, 2" 150# F/E

Time				Pressure (barG)	Temperature Readings (°C)							
					Flame Environment			Body	Side Piece	Calorimeter Cube		
Hr	Min	Sec			F 1	F 2	Average			C 1	C 2	Average
10	20	30		2.0	871	871	871.0	616	883	793	833	813.0
10	21	0		2.1	867	871	869.0	615	880	789	829	809.0
10	21	30		2.1	867	869	868.0	618	879	789	827	808.0
10	22	0		2.1	870	873	871.5	618	878	789	825	807.0
10	22	30		2.1	868	871	869.5	621	879	788	827	807.5
10	23	0		2.1	872	874	873.0	622	883	791	823	807.0
10	23	30		2.1	870	875	872.5	623	879	790	820	805.0
10	24	0		2.0	871	873	872.0	623	877	790	824	807.0
10	24	30		2.0	867	870	868.5	627	879	787	821	804.0
10	25	0		1.9	867	871	869.0	631	876	786	824	805.0
10	25	30		2.1	865	872	868.5	628	872	789	825	807.0
10	26	0		2.1	864	876	870.0	628	875	787	828	807.5
10	26	30		2.1	864	877	870.5	624	878	790	830	810.0
10	27	0		2.1	867	880	873.5	627	880	791	826	808.5
10	27	30		2.0	863	881	872.0	629	879	793	830	811.5
10	28	0		2.1	861	883	872.0	631	880	795	830	812.5
10	28	30		2.1	864	883	873.5	627	878	793	832	812.5
10	29	0		2.0	864	883	873.5	630	877	797	835	816.0
10	29	30		2.0	866	883	874.5	634	874	794	836	815.0
10	30	0		2.0	863	887	875.0	633	874	790	832	811.0
10	30	30		2.0	862	886	874.0	634	877	787	829	808.0
10	31	0		2.1	861	888	874.5	637	879	790	826	808.0
10	31	30		2.0	862	890	876.0	640	881	790	824	807.0
10	32	0		2.1	865	887	876.0	636	882	788	825	806.5
10	32	30		2.0	815	837	826.0	586	832	738	775	756.5
10	33	0		2.1	715	737	726.0	486	732	638	675	656.5
10	33	30		2.0	358	369	363.0	243	366	319	337.5	328.3
10	34	0		1.9	179	184	181.5	122	183	160	169	164.1
10	34	30		2.0	89	92	90.8	61	92	80	84	82.1
10	35	0		2.0	51	56	53.5	68	73	79	80	79.5

Average Pressure maintained during 30 minutes :	**2.05**	2.1 ± 5%
Average Flame thermocouple value reached within 2 minutes :	**861**	(> 750 °C)
Minimum flame thermocouple values in next 28 minutes :	**857**	(> 700 °C)
Maximum flame thermocouple values in next 28 minutes :	**887**	(< 1000 °C)
Average of flame thermocouple values in next 28 minutes :	**870.4**	(> 750 °C)
Average of Body temperature values in any 5 minutes :	**629.5**	(> 590 °C)
Average of Side Piece temperature values in any 15 minutes :	**880.1**	(> 650 °C)
Average of Calorimeter values reached in 15 minutes :	**811.5**	(> 650 °C)
Average of Calorimeter values in next 15 minutes :	**810.5**	(> 650 °C)

ASNT NDT LEVEL II LT 103918

BUREAU VERITAS (INDIA) PRIVATE LIMITED SURVEYOR AT AHMEDABAD

07/05/2024
Shailesh

Plasma And Vacuum Technologies

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List of Calibration Reports of Instruments / Documents attached

Manufacturer:	Fluid-O-Mech Control's Inc.	Date:	07/05/2024
Valve:	2 PC Ball Valve, 2" 150# F/E		

1. Pressure Gauge, PVT/SD/GP4D/05
2. Temperature Sensor, Thermocouple, PVT/SD/TST/31
3. Temperature Sensor, Thermocouple, PVT/SD/TST/32
4. Temperature Sensor, Thermocouple, PVT/SD/TST/33
5. Temperature Sensor, Thermocouple, PVT/SD/TST/34
6. Temperature Sensor, Thermocouple, PVT/SD/TST/35
7. Temperature Sensor, Thermocouple, PVT/SD/TST/36
8. NDT Level III certification of Mr. Venkat N. Ramani.

ASNT NDT LEVEL III LT 153918

Verified.
VERITAS (INDIA) PRIVATE LIMITED SURVEYOR AT AHMEDABAD
02/05/2024
Shaikh