

# TEST REPORT

Ph: 011-86-20-82260946 • Fax 011-86-20-82260856 • Web: www.iapmo.org  
No. 201, Building A, Yushu Industrial Park, Science City, Guangzhou, Guangdong – China



**Report Number:** 1664-13006

**Report Issued:** June 3, 2013

**Project No.:** 21286

**Client:** Mainline Backflow Products  
12530 128TH STREET  
Edmonton, Alberta T5L 1C8  
CANADA

**Source of Samples:** The samples were sent by the manufacturer and received by IAPMO R&T Lab in good condition on January 31, 2013

**Date of Testing:** February 3, 2013 through May 20, 2013

**Sample Description:** Backwater Valves

Model:

Model	Description
MLST446-ABS	4" ABS backwater valve
MLST446-PVC	4" PVC backwater valve
MLST668-ABS	6" ABS backwater valve
MLST668-PVC	6" PVC backwater valve

**Scope of Testing:** The purpose of the testing was to determine if the samples tested of the backwater valves met the applicable requirements of ASME A112.14.1-2003 entitled, "Backwater Valves".

**Conclusion:** **The samples tested of the backwater valves from Mainline Backflow Products, models were shown above, COMPLIED with the applicable requirements of ASME A112.14.1-2003.**

By our signatures below we certify that all the testing and sample preparation for this report was performed under continuous, direct supervision of IAPMO R&T Lab, unless otherwise stated.

Tested by,

Freeman Liu, Project Engineer

Reviewed by,

Xicheng Xiong, Testing Manager

**Primary Standards:** ASME A112.14.1-2003

- 2 Requirements
- 2.1 Dimensions
- 2.2 Performance Requirements
- 2.3 Connections
- 2.4 Materials and Finishes
- 3 Testing
- 3.1 Water Flow
- 3.2 Watertightness
- 4 Markings

Sections not listed above are considered not applicable to the product.

**Test Results:** All tests and evaluations were conducted per the written procedure in the specified standard.

ASME A112.14.1-2003

2 Requirements

2.1 Dimensions

2.1.1 Minimum Dimensions – COMPLIED

The backwater valve complied with the minimum dimensional requirements indicated in Tables 1 through 3.

Findings: Tables 2 and 3 are not applicable.

Table 1 – Horizontal Valves

Location		MLST446-ABS	MLST446-PVC	MLST668-ABS	MLST668-PVC
A(in and out)	Finding(in.)	4.00	6.05	4.03	6.05
	Required(in.)	4(min)	6(min)	4(min)	6(min)
B(top)	Finding(in.)	6.64	8.60	6.64	8.66
	Required(in.)	6(min)	8(min)	6(min)	8(min)

2.2 Performance Requirements

2.2.1 Normally Closed Backwater Valve – COMPLIED

The backwater valve was designed in such a manner that when installed at 1/4 inch per foot slope, the swing check remains closed until flow causes it to open. The valve remains sufficiently open during periods of low flows to avoid the screening of solids.

2.2.3 Grade – COMPLIED

The valve was designed and constructed such that when it is installed in its proper operating position in the drainage system, the extended top pipe allows the slope to be determined by placing a level on the cover.

### 2.2.4 Access – COMPLIED

The valve shall be designed to provide access to working components for repair or replacement. The size of the access shall be based upon the requirements necessary to perform the repair or maintenance. The access cover shall be water and gas tight once installed.

Findings: The valve was designed to provide access to working components for repair or replacement.

Note: No cover was provided to determine if water or gas tight.

### 2.2.5 Sealing Elements – COMPLIED.

Parts that are used to affect sealing were secured in such a manner as to maintain proper alignment of mating surfaces. Moving and stationary parts will not loosen or become detached during handling or operation of the unit and were replaceable.

## 2.3 Connections

### 2.3.5 Solvent Cement – COMPLIED

ABS solvent cement joints shall be in accordance with ASTM D2661 and PVC solvent cement joints shall be in accordance with ASTM D2665.

#### MLST446-ABS

Location	A	A Out-of-Roundness	B	B Out of roundness	C	E
Inlet (in.)	4.5140	0.021	4.4850	0.012	1.7545	0.2585
Outlet (in.)	4.5190	0.018	4.4885	0.010	1.7555	0.2580
Requirement for 4" (in.)	4.510 to 4.525	0.030	4.482 to 4.500	0.030	1.750 min.	0.250 min.
Top Opening (in.)	6.6455	0.030	6.603	0.035	3.0455	0.2820
Requirement for 6" (in.)	6.636 to 6.658	0.060	6.603 to 6.625	0.060	3.000 min.	0.281 min.

#### MLST446-PVC

Location	A	A Out-of-Roundness	B	B Out of roundness	C	E
Inlet (in.)	4.5150	0.013	4.4895	0.005	1.7585	0.2545
Outlet (in.)	4.5180	0.015	4.4880	0.005	1.7550	0.2555
Requirement for 4" (in.)	4.515 to 4.530	0.030	4.482 to 4.500	0.030	1.750 min.	0.250 min.
Top Opening (in.)	6.6530	0.010	6.6250	0.005	3.0575	0.2810
Requirement for 6" (in.)	6.637 to 6.662	0.060	6.603 to 6.625	0.060	3.000 min.	0.281 min.

MLST668-ABS

Location	A	A Out-of-Roundness	B	B Out of roundness	C	E
Inlet (in.)	6.6365	0.021	6.6100	0.013	3.0455	0.2810
Outlet (in.)	6.6400	0.025	6.6165	0.015	3.0505	0.2810
Requirement for 6" (in.)	6.636 to 6.658	0.060	6.603 to 6.625	0.060	3.000 min.	0.281 min.
Top Opening (in.)	8.6550	0.045	8.6200	0.040	4.0730	0.3300
Requirement for 8" (in.)*	8.655 to 8.685	0.090	8.595 to 8.625	0.090	4.000 min.	0.328 min.

\*Note: the dimensions and tolerances requirement for 8" (ABS) was supplied by manufacturer.

MLST446-PVC

Location	A	A Out-of-Roundness	B	B Out of roundness	C	E
Inlet (in.)	6.6545	0.008	6.6240	0.005	3.0570	0.2810
Outlet (in.)	6.6555	0.010	6.6220	0.008	3.0550	0.2810
Requirement for 6" (in.)	6.637 to 6.662	0.060	6.603 to 6.625	0.060	3.000 min.	0.281 min.
Top Opening (in.)	8.6850	0.022	8.6000	0.035	4.0995	0.3295
Requirement for 8" (in.)	8.655 to 8.685	0.090	8.595 to 8.625	0.090	4.000 min.	0.328 min.

2.4 Materials and Finishes

2.4.1 General Materials – COMPLIED

The unit tested was made of materials suitable for installation and service. Refer to section 2.4.6 of this report.

2.4.2 Internal Working parts – COMPLIED

The internal working part (flapper) made of ABS or PVC, which is non-corrosive material. The molding was sound, free of blow holes, cold shuts, fins, flashings, and other imperfections affecting the quality and with uniform thickness.

2.4.5 ABS – COMPLIED

The ABS material is currently CSA listed under file No. 090211 as model PA 747 J-01 by Chi Mei Corporation and conformed to the physical property requirements contained in ASTM D3965 with the minimum cell classification as 3-2-2-2-2. The minimum thickness of the valve body was 0.256" for size 4" and 0.281" for size 6".

2.4.6 PVC – COMPLIED

The PVC compounds which were supplied by Fine Hau Industry (Canada) Ltd. complied with the requirement contained in ASTM D1784, and the cell classification was 1-3-5-6-4. Refer to the IAPMO test report #1664-13005-003. The minimum thickness for the valve body was 0.251" for size 4" and 0.281" for size 6".

2.4.8 Finishes – NOT APPLICABLE

The backwater valve was not coated.

3 Testing

3.1 Water Flow – COMPLIED

The backwater valve opening passed a cylinder 12” in length and 2” in diameter for size 4”, and a cylinder 12” in length and 3” in diameter for size 6”.

3.2 Watertightness – COMPLIED

The valve was positioned in its normal operating position as prescribed by the manufacturer. A water source was affixed to the outlet of the backwater valve and the water pressure increased to 5 psi as follows in 10 minute increments:

Findings:

MLST446-ABS		
Water Pressure (psi)	Observed leakage per 10 Min Period	Leakage allowed (max)
0.25	45 mL	1139 mL
0.50	32 mL	
1.0	40 mL	
5.0	4 mL	

MLST446-PVC		
Water Pressure (psi)	Observed leakage per 10 Min Period	Leakage allowed (max)
0.25	40 mL	1139 mL
0.50	30 mL	
1.0	49 mL	
5.0	5 mL	

MLST668-ABS		
Water Pressure (psi)	Observed leakage per 10 Min Period	Leakage allowed (max)
0.25	8 mL	2473 mL
0.50	5 mL	
1.0	2 mL	
5.0	2 mL	

MLST668-PVC		
Water Pressure (psi)	Observed leakage per 10 Min Period	Leakage allowed (max)
0.25	8 mL	2473 mL
0.50	4 mL	
1.0	2 mL	
5.0	2 mL	

4 Marking – COMPLIED

The backwater valve was marked (molded on the valve body) as follows:

- (a) Manufacturer’s name or trademark,
- (b) Material,
- (c) Nominal size:
- (d) Direction of Flow,

**Photograph of Sample Tested:**

