



P.O. Box 772887
Ocala, Florida 34477-2887
(352) 694-7195
(800) 782-5268

July 15th, 2017

WMS - Water Management Solutions
2240 Woolbright Road, Suite 403
Boynton Beach, FL 33426

Atten: Eng. Mauricio Barreda

We, at MARS Company, have completed performance testing on the WMS, Incorporated Acqua Flow Device for water line applications. This brief report is restricted to potable water applications only and we have not tested the device using any other liquid.

Equipment Used: MARS Company conducted the testing on our MARS produced test stand known as the MARS System One Water Meter Test Bench with gravimetric system Certified to NIST Handbook 44 used for precision testing and certification of water meter performance for domestic water use of all types and sized from 5/8 of an inch up through 2-inch. For the purpose of these tests, the device was fitted downstream of a Neptune Trident 2- inch Disk Type Water Meter which was tested and fully complies with AWWA Standard C-700 latest revision for new water meters. Since the meter was new, no further improvement in the accuracy standards could be measured. Used or poorly performing meters would have shown improved performance if the meters did not comply with AWWA New Meter Standards. The device was also tested in an open line without any water meter in order to establish a base line for flow comparisons.

You have a copy of the flow test results that we produced and I will refer to them in this report.

First, the normal in service operating maximum is 100 GPM although the meter is manufactured to handle peak flows of 160 GPM for short periods of time. For maximum life and accuracy, the 100 GPM is the industry accepted field condition. In the first test, without using the Acqua Flow Device, we set the flow rate at 100 gpm. We then installed the flow device in the same line downstream from the same water meter and without any changes to the pump pressure or valve settings, we attained a flow rate of 87 gpm without any effect on the meter accuracy. There are no sounds or vibrations produced by the flow device. Pressure at the meter is impacted by the presence of the Acqua Flow Device and that is as follows. Without the device installed in the water line, we recorded 50 PSI flow pressure at the meter. With the device installed in the water line downstream of the meter, we recorded 62 PSI flow pressure.

The Acqua Flow device acts as a partial flow restrictor and increases the pressure at the meter which is a positive effect since the meter tends to operate more smoothly and evenly regarding flow rates at higher pressures. Further, 87 gpm is adequate to handle any domestic water use requirement and is virtually not noticed by the end users.

A major positive effect is the reduced flow of the meter which reduces meter speed and improves accuracy by as much as two to three percent due to the reduction in vibration and the factor of a smooth laminar flow through the meter. An additional effect is the extending of the meter's life by as much as 20% due to the reduced flow rate and reduced friction within the measuring chamber of the meter. The presence of entrained air is also minimized in that the Acqua Flow device increases pressure at the meter and that minimizes the size of air bubbles by compression of entrained air and causes the meter to limit part of the air damage that is normal and allows the meter to mostly measure only water. Once entrained air passes the Acqua Flow device and comes back down to a lower pressure, the air is eliminated through the customer service with no negative effect.

The device is very well made and is, in our opinion, a useful device for improved the performance and life of water meters. The device will polish the flow and reduce vibration within the meter caused by entrained air. That will greatly reduce the amount of pipeline debris and pipe scale that can be broken loose by vibration thereby damaging the meter. We believe this device is novel and creative and will improve meter performance and reduce maintenance cost. Since time did not allow long duration testing on this meter with the Acqua Flow device installed, the actual improvement in performance has historically been two to three percent when these two factors are improved within the service line. Since the Acqua Flow device achieves this end, it is believed that one can expect improved performance and extended life of time.

Very truly yours,

A handwritten signature in black ink, appearing to read "F. Salser, Jr.", with a stylized, cursive script.

MARS Company
Floyd S. Salser, Jr.
President and C.E.O.

METER BRAND	SIZE	SERIAL#	FLOWRATE	START READING	UNIT GAL	FINISH READING	UNIT GAL	ACTUAL VOLUME	PERCENTAGE
NEPTUNE									
Test	2"	80000011	100 GPM	8655307	100	8655407	100	99.95	100.05%
Without Acqua Flow			15 GPM	8655407	100	8655506	100	100.21	98.79%
METER BRAND	SIZE	SERIAL#	FLOWRATE	START READING	UNIT GAL	FINISH READING	UNIT GAL	ACTUAL VOLUME	PERCENTAGE
NEPTUNE									
Test	2"	80000011	87 GPM	8655537	100	8655636	100	99.95	99.05%
With Acqua Flow			15 GPM	8655636	100	8655735	100	100.11	98.89%

Test result are the same
accepp for flow rate on high
flow.