TEST REPORT

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Report Number: 1707-12003

Report Issued: June 25, 2012 Project no.: 20449

Client: Watermiser manufacturing company
1106 second st.
Encinitas, CA 92024
Contact: Ken Margulis

Source of Samples: The samples were from Watermiser manufacturing company on May 22, 2012 and were received in good condition.

Date of Evaluation: June 01, 2012 to June 25, 2012.

Sample Description: Model FCVSS - 1.00 GPM Stainless Steel Flow Control Valve.

Scope of Testing: The purpose of this testing is to determine if the Model FCVSS - 1.00 GPM Stainless Steel Flow Control Valve meet the requirements of NSF/ANSI 61 – 2011, section 9.

Conclusion: **The Watermiser manufacturing company Model FCVSS - 1.00 GPM Stainless Steel Flow Control Valve COMPLIED with NSF/ANSI 61 – 2011, section 9. Please refer to page 2 to page 6 for more detailed findings.**

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.

Tested by, Reviewed by,

Hanmei Li, Chemist

Michael Briggs, Manager, Analytical Lab

PRIMARY STANDARD: NSF/ANSI 61 – 2011, section 9

Preparation of Test Samples

Test samples were rinsed and conditioned as described in NSF/ANSI 61-2011, Sections B.5.2 and B.5.3.

Conditioning and Exposure

In-product conditioning and exposure were conducted as described in NSF/ANSI 61 – 2011 Annex B, section B.5.3 and B.5.4. Three (3) sets each with (20) assembled valves were exposed to extraction water for conditioning and exposure for metal evaluations, and 3 composite samples were prepared for analysis. An assembled vale consists of all components supplied by the manufacturer that contact water.

Exposure and Normalization

Following conditioning, the samples were exposed to extraction water at operating temperature according to the applicable scheme detailed in annex B, Sections B.5.4.1 thru B.5.4.3.

The concentration of extracted contaminants were normalized to end use (residential) conditions according to the normalization procedure outlined in annex B, sections B.8.8.1 and B8.8.2.

The laboratory concentration was normalized using the equation of:

$$\frac{\text{Lab concentration (ug/L) x the device volume (L) x CMV}}{\text{Volume in field (1L if device volume =1L or less)}}$$

The CMV is determined as the ratio of the cold water volume to the total device volume. Laboratory measured volumes were used for all calculations.

Extraction Water

The extraction water was prepared as described in NSF/ANSI 61-2011, Section B.5.5 by combining:
25 ml of 0.4M sodium bicarbonate
Chlorine stock solution as described in annex B Section B.9.2.4
Deionized water meeting ASTM D1193 Type II to 1L. Adjust pH with 0.1N HCl as necessary to pH 8±0.5.

Water prepared in this manner shall have an alkalinity of 500 ppm (±25 ppm), dissolve inorganic carbon of 122 ppm (± 5 ppm) and 2ppm (± 0.5 ppm) free chlorine.

Collection / Preservation of Extraction Water

Immediately following the exposure period, extraction waters collected for analysis were poured into previously prepared sample containers for storage until analysis, as specified in annex B, Section B.6 and Table B8.

Sample extracts for metal analysis were acidified with nitric acid as specified in EPA 200.8 protocols.

Evaluation of Contaminant Concentrations

For the contaminant of lead, on days 3, 4, 5, 10, 11, 12, 17, 18, and 19, the 16 hour dwell extractant water was collected and the Test Statistic, Q, was determined as described in Annex B, section B.8.9 and compared to 11 ug.

For metal contaminants, other than lead, the geometric mean value of the normalized contamination concentrations of three (3) samples from exposure day 19 were compared to their respective SPACs as described in section B.5.4.

Organic contaminants were measured on the exposure day 19 16 hour dwell extractant water.

Analytical methodology

Metal determinations: EPA 200.8, Metal determinations by ICP/MS

Analytical Instrumentation

Metal determinations: Thermo Electron X7 ICP/MS with CCT

Discussion:

Model FCVSS - 1.00 GPM Stainless Steel Flow Control Valve is evaluated in this report.

This valve is made from stainless steel 303. A copy of the composition of SS303 has been appended to the PMI. Section 3, Table 3.1 analytes for stainless steel (regulated metals and nickel) were monitored on the appropriate retained exposure water samples.

Xiamen Maifen N6118F is used in this valve. The material is listed to NSF/ANSI-61 by NSF as a mechanical plumbing device with an exposure rate of 2.0 in^2/liter. The PMI indicates the total wetted surface area of this material of 1.0 in^2 which is within the criteria of the listing and no additional testing is required for this material.

To verify compliance to NSF/ANSI 61, regulated metals were monitored in the retained day 19 exposure water.

The statistic Q for lead was determined from the normalized lead exposure data, measured in the appropriate retained exposure water samples. The Statistic Q was found to be 0.004 which is less than the maximum Q of 11 set in the standard.

The geometric mean of the normalized concentrations found in the retained day 19 exposure waters was calculated for the remaining metals. Except for tin, which does not have specific acceptance criteria set in the standard, the geometric means were less than the respective SPAC concentrations set in the standard.

There is no specific acceptance criteria set in the standard for tin; however ANNEX A provides guidelines for determining acceptance criteria by performing a risk assessment. A risk assessment was generated by TOXservices, which concludes that tin is not likely to be a significant health risk at a level at or below 20 ppb. The normalized concentration of inorganic tin was well below this level.

Day 19 Regulated Metals and Zinc, less Lead:

Metal	SPAC (ug/L)	Normalized Contaminant Concentration (ug/L)			Normalized Geometric Mean	Test Method
		Sample #1	Sample #2	Sample #3		
Aluminum	2000	324 (0.3)	687 (0.7)	321 (0.3)	0.415	EPA 200.8
Antimony	0.6	4.321 (0.004)	2.281 (0.002)	2.910 (0.003)	0.003	EPA 200.8
Arsenic	1.0	ND (< 0.001)	ND (< 0.001)	ND (< 0.001)	ND (< 0.001)	EPA 200.8
Barium	200.0	8.630 (0.009)	5.254 (0.005)	5.989 (0.006)	0.006	EPA 200.8
Beryllium	0.4	ND (< 0.000)	ND (< 0.000)	ND (< 0.000)	ND (< 0.000)	EPA 200.8
Bismuth	50.0	ND (< 0.000)	ND (< 0.000)	ND (< 0.000)	ND (< 0.000)	EPA 200.8
Boron	500.0	25.4 (0.03)	4.250 (0.004)	3.444 (0.003)	0.007	EPA 200.8
Cadmium	0.5	ND (< 0.000)	0.080 (0.000)	ND (< 0.000)	0.000	EPA 200.8
Chromium	10.0	2.375 (0.002)	1.157 (0.001)	1.553 (0.002)	0.002	EPA 200.8
Copper	130.0	67.9 (0.07)	23.4 (0.02)	26.3 (0.03)	0.035	EPA 200.8
Mercury	0.2	0.058 (0.000)	ND (< 0.000)	ND (< 0.000)	0.000	EPA 200.8
Nickel	20.0	3.277 (0.003)	1.115 (0.001)	1.073 (0.001)	0.002	EPA 200.8
Selenium	5.0	0.498 (0.000)	ND (< 0.000)	ND (< 0.000)	0.000	EPA 200.8
Silver	10.0	ND (< 0.000)	ND (< 0.000)	ND (< 0.000)	ND (< 0.000)	EPA 200.8
Thallium	0.2	ND (< 0.000)	ND (< 0.000)	ND (< 0.000)	ND (< 0.000)	EPA 200.8
Tin	20.0	4.903 (0.005)	1.499 (0.001)	1.004 (0.001)	0.002	EPA 200.8
Zinc	300.0	74.3 (0.07)	67.7 (0.07)	76.0 (0.08)	0.073	EPA 200.8

SPAC: Single Product Allowable Concentration

Note: Normalized Contaminant Concentration =

$$\frac{\text{Lab Concentration (ug/L) x device volume (L) x CMV}}{\text{Volume in field (1L if device volume =1L or less)}}$$

CMV = Cold Water Volume/ Total Device Volume

Normalized data is within parentheses

Test Results of Lead Dosage:

The lead leaching results as a function of exposure day for triplicate set of the Model FCVSS - 1.00 GPM Stainless Steel Flow Control Valve are presented as follows:

Note: The number in parentheses represent the lead leaching concentrations adjusted to One (1) Liter and then multiplied by the cold mix volume adjustment (CMV), which can be

$$\frac{\text{Lead leachate concentration (ug/L) x Volume of the device (L) x CMV (1.000)}}{\text{Volume in field (1L if device volume =1L or less)}}$$

CMV = Cold water volume/ Total device volume

Total Volume of the Model FCVSS - 1.00 GPM Stainless Steel Flow Control Valve was measured as 1 mL.

Model #	Specimen	Lead leachate concentrations for individual faucets (ug)		
		Day 3	Day 4	Day 5
FCVSS-1.00 GPM	1	12.0 (0.01)	3.28 (0.00)	3.19 (0.00)
	2	4.15 (0.00)	4.05 (0.00)	3.15 (0.00)
	3	4.71 (0.00)	2.24 (0.00)	1.48 (0.00)

Model #	Specimen	Lead leachate concentrations for individual faucets (ug)		
		Day 10	Day 11	Day 12
FCVSS-1.00 GPM	1	2.28 (0.00)	2.04 (0.00)	2.14 (0.00)
	2	3.81 (0.00)	2.76 (0.00)	8.08 (0.01)
	3	2.30 (0.00)	6.50 (0.01)	1.84 (0.00)

Model #	Specimen	Lead leachate concentrations for individual faucets (ug)		
		Day 17	Day 18	Day 19
FCVSS-1.00 GPM	1	2.14 (0.00)	4.24 (0.00)	4.77 (0.00)
	2	1.73 (0.00)	1.49 (0.00)	2.3 (0.00)
	3	2.81 (0.00)	1.46 (0.00)	2.67 (0.00)

Note: Detection limit normalized to the test unit is used to calculate Q when lead is below detection

Calculations of the Test Statistic, Q was determined as follows and compared to 11 ug:

Model #	Q	Y1	Y2	Y3	Y	S
FCVSS-1.00 GPM	0.004	-5.696	-5.773	-5.968	-5.813	0.1401

Y1 = Arithmetic Mean Value of the Nine (9) measured days of Natural Log-Transformed Value of the Lead Dosage for Specimen #1

Y2 = Arithmetic Mean Value of the Nine (9) measured days of Natural Log-Transformed Value of the Lead Dosage for Specimen #2

Y3 = Arithmetic Mean Value of the Nine (9) measured days of Natural Log-Transformed Value of the Lead Dosage for Specimen #3

Y = Log - Dosage Mean (Arithmetic Mean Value of Y1, Y2, and Y3)

S = Log - Dosage Standard Deviation

Q = Natural Antilogarithm of Y x Natural Antilogarithm of K1 (2.60281) x S.

Conclusion: The test statistic Q (0.004) of the Model FCVSS - 1.00 GPM Stainless Steel Flow Control Valve was found to be less than 11 ug and the samples tested as acceptable.