



# QUALITY FILTER TESTING LABORATORY, LLC

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EPA ID # NJ01298 NJ DEP ID # DE009 IAPMO ID #102

## FILTER WATER TEST REPORT

**Report #** 18-38 (Berkey With Post Filter)  
**Report Date:** 02/18/2018  
**Customer Name:** New Millennium Concepts, Ltd.  
**Product:** Berkey Gravity Filter with post filter  
**Volume Tested:** 100 gallons  
**Flushing Volume:** 1 gallon  
**Test Description:** Std. 53 – Fluoride  
**Performance Standard:** 53 – 2015  
**Fluoride P/F:** Passed  
**Pass/Fail Criteria (Fluoride):** 81.3% Reduction

Table 1. Fluoride Test

Accumulated Volume	Influent Water Fluoride Concentration in mg/L	Influent Water pH	TDS in mg/L	Effluent Fluoride Concentration in mg/L	Fluoride % Reduction
Start	3.82	6.46	327	0.10	97.4
5 gallons	3.82	6.46	327	0.06	98.4
25 gallons	3.75	6.48	320	0.07	98.1
50 gallons	3.79	6.52	318	0.07	98.2
75 gallons	3.80	6.51	310	0.07	98.2
100 gallons	3.80	6.52	312	0.11	97.1

### CERTIFICATION OF RESULTS:

I certify in writing that all analyses, and reporting performed herein, comply with all requirements set forth in N.J.A.C. 7:9E and N.J.A.C. 7:18, and hereby certify that this laboratory is in compliance with all laboratory certification and quality control procedures and requirements as set forth in N.J.A.C. 7:18; the NYCRR Subpart 55-2, the National Environmental Laboratory Accreditation Conference (NELAC) Institute Standards, and the ISO 17025.

**Disclaimer:** The test results are only related to the filter cartridges tested, in the condition received at the laboratory.

**Jaime Young**

Jaime Young  
Lab Director

# **PF-2/PF-4 Fluoride Reduction Media Information**

(Extract from Proprietary Products Data Information Sheets)

## **PRODUCT INFORMATION:**

The Proprietary Fluoride Reduction Media is a new and improved high yield aluminum oxide especially formulated for the removal of Fluoride and arsenic from drinking water. This media has an unusually high surface area of more than 350 sq.m./gram of material which allows more efficient removal of the Fluoride and arsenic ions. This high surface area is enhanced by controlled development of the pore size distribution from 30Angstroms to 100Angstroms, providing greater accessibility to the surface active sites through bulk diffusion.

Uniform particle size low silica content and high purity, is characteristic of the new and improved Proprietary Fluoride Reduction Media which insures effective operation in the reduction of Fluoride. The extremely low silica content significantly reduces the tendency of the silica to form silicone tetra fluoride which reacts with both the media and the pipes leading to clogging and corrosion problems.

## **PRODUCT APPLICATION:**

The Proprietary Fluoride Reduction Media is an EPA approved method for removing Fluoride from drinking water. This product can be used in various filtration products and can also be packed in large columns for high volume applications including drinking water treatment plants and waste treatment plants. The Proprietary Fluoride Reduction Media can be used in various applications where defluorination is necessary.

For maximum removal efficiency, maintain the water being treated between a PH level of 5-7. The media can be regenerated for enhanced performance lifetime with many applications. This makes the Proprietary Fluoride Reduction Media the most effective and economical defluorination product on the market.

## **TYPICAL PHYSICAL PROPERTIES OF PROPRIETARY FLUORIDE REDUCTION MEDIA:**

Surface Area, sq. m/g.	350
Total Pore volume, cc./g.	.55
Aluminum Oxide XRD Phase	Chi, Gamma, Amorphous
Crush Strength, lbs (kg)	30 (14)
Abrasion Loss wt%	0.1
Bulk Density, lbs/cu. ft (kg/cu. m)	47 (750)

## **TYPICAL CHEMICAL PROPERTIES OF PROPRIETARY FLUORIDE REDUCTION MEDIA:**

	Wt %
AL <sub>2</sub> O <sub>3</sub>	95.1
SiO <sub>2</sub>	0.02
Fe <sub>2</sub> O <sub>3</sub>	0.02
Na <sub>2</sub> O	0.30

**GENERAL INFORMATION:**

The Proprietary Fluoride Reduction Media has been specially prepared to optimize the media for more efficient removal of the Fluoride ion. Testing of the material is important for each application as influent water PH, quality and purity of the water and various metal ion concentrations are all variables which influence the effectiveness of the media. Note that the material is most efficient between a PH of 5 and 7.

Testing for fluoride removal was based on 20-30 ppm of the ion in the influent aqueous solution at a flow rate of no more than 3 gpm per cubic foot (25kg) of media. Results of < 1 ppm of the fluoride ion in the effluent were typical for the media. Under optimum conditions, effluent concentrations of less than 50 ppb of Fluoride ion were found to be readily achieved. Results may vary significantly with each particular application.

**OTHER INFORMATION:**

1. Calcium & Sodium Fluoride. The Proprietary Fluoride Reduction Media will remove any types of inorganic fluoride salts. All fluoride salts are soluble in water. So it does not matter what fluoride salts that are in the water, fluoride is present as an anion where the media will absorb fluoride ions in water.

2. Hydro-Fluorosilicic Acid (HFS). We do not have any test data to show how efficient the Proprietary Fluoride Reduction Media will remove hydro-fluosilicic acid. But by adsorption of fluoride anion using alumina, we believe the media will remove hydro-fluosilicic acid better than fluoride. The reason is both compounds are ions with negative charges. The molecular size of hydrofluosilicic acid is much larger than the fluoride ion and hydrofluosilicic acid has two negative charges where as fluoride has only one negative charge. So this negative charge makes hydrofluosilicic acid much easier to adsorb to the media compared to regular fluoride ions.

3. NMCL obtains its Proprietary Fluoride Reduction Media from a third party that manufactures specialized media that targets difficult to remove contaminants, such as Fluoride and Arsenic. The above information provided has been extracted from the supplier's data sheets and other written communications.



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## TURBIDITY TEST REPORT

Filter Element Berkey PF-2

Report # 15-73-PF-2

Report Date: 05/05/2015

Customer Name: New Millennium Concepts, LTD.

Site Address: PO Box 201411, Arlington, TX 76006

Date Sampled: 04/30/2015

### Priming Procedure:

With the blue cap in place, the filter element was washed with mild dish soap.

With clean hands, the blue caps were removed from both ends of the PF-2 element.

With the rubber-priming button in place, the PF-2 was aligned with the hole of the PF-2 hole.

The priming button was pressed against the sink faucet to create a seal.

While holding the priming button against the faucet, the PF-2 element was flushed with cold tap water, until the discharge water was clear.

The PF-2 element was turned in the opposite direction repeating all the steps above.

The Filters were installed and the flushing procedure was repeated after each cycle. A total of 3 cycles were performed and the flushing time until the water was coming clear was recorded and report in the Table below.

### Installation Procedure:

Two Berkey Black elements were primed following the same procedure described for the PF-2 elements above.

The two Black Berkey elements were installed inside the Berkey top chamber of the filtration system.

With the water flow arrow pointing away from the upper chamber, the PF-2 elements were screwed into the stems of each Black Berkey element underneath of the chamber.

The top chamber was set up over the bottom reservoir ready for testing.

### Test Procedure:

The top chamber was filled with cold tap water (first cycle). The water was collected and tested.

The bottom reservoir was emptied out; rinsed with DI water and set up to collect a second cycle.

The PF-2 cartridges were removed and prime following the procedure described above. The top chamber was filled a second time, the water was collected and tested.

The bottom reservoir was emptied out; rinsed with DI water and set up to collect a third cycle.

The PF-2 cartridges were removed and prime following the procedure described above. The top chamber was filled a third time, the water was collected and tested.

The test results are summarized in the Table below.

Parameter Tested	Filtered Water 1 <sup>st</sup> cycle	Filtered Water 2 <sup>nd</sup> cycle	Filtered Water 3 <sup>rd</sup> cycle	EPA Maximum Contaminant Level (MCL)
Turbidity	2.8 NTU	1.9 NTU	0.7 NTU	<1 NTU
Aluminum	50 µg/L	42 µg/L	40 µg/L	200 µg/L
Flushing Time (one direction)	25 seconds	25 seconds	15 seconds	Not applicable
Flushing Time (opposite direction)	15 seconds	10 seconds	10 seconds	Not applicable

**Jaime A. Young**

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Lab Director

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