

STATE OF COLORADO

John W. Hickenlooper, Governor
Larry Wolk, MD, MSPH
Executive Director and Chief Medical Officer

Dedicated to protecting and improving the health and environment of the people of Colorado

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Colorado Department
of Public Health
and Environment

June 6, 2014

Peter Brown
Operations Manager
The Strainrite Companies
65 First Flight Dr.
Auburn, Maine 04210

Subject: Acceptance of the Strainrite Aqua-Maxx Hybrid Filter Element Series as an Alternative Filtration Technology to meet the *Colorado Primary Drinking Water Regulations* requirements for *Giardia lamblia* and *Cryptosporidium* Removal

Dear Mr. Brown,

The Colorado Department of Public Health and Environment's (CDPHE) Water Quality Control Division ("the Department") has received and reviewed the information for the Strainrite Aqua-Maxx Hybrid Filter Element Series in accordance with Section 11.8(2)(b)(ii) and 11.10(5)(j) of the *Colorado Primary Drinking Water Regulations* (Regulation 11), 5 CCR 1002-11. The Strainrite Aqua-Maxx hybrid filter meets or exceeds the requirements of the *State of Colorado Design Criteria for Potable Water Systems* (DCPWS) Sections 1.11, 4.3.9 and the requirements of Regulation 11. The technology is conditionally accepted for use as an Alternative Filtration Technology and granted the removal credit in Table 4.2, Section 4.3.9.2 of the DCPWS. The hybrid filter elements and filter housings acceptable for use with the Strainrite Aqua-Maxx hybrid filter are subject to the conditions outlined in Table 1 of this document and Section 4.3.9 of the DCPWS.

This acceptance supersedes all previous acceptance letters of the Aqua-Maxx Hybrid Filter Elements and associated housings.

This acceptance addresses the following items:

- Aqua-Maxx PFA (Prefilter) in the Strainrite AQ2-2 Vessel manufactured after January 1, 2007 with AQB-Perf Basket.
- Aqua-Maxx FFA (Final Filter) in the Strainrite AQ2-2 Vessel manufactured after January 1, 2007 with AQB-Perf Basket.

This acceptance applies only to the Strainrite Aqua-Maxx Hybrid Filter Element Series (Aqua-Maxx PFA and Aqua-Maxx FFA) technology and does not constitute construction approval for installation in public water systems. Each individual submittal to the Department must demonstrate conformance with Section 4.3.9 of the DCPWS for each installation of the filters and housings. **Review and approval for the design of any public water system proposing to use this technology will be handled on a case-by-case basis by the Department as required by Section 11.4 of Regulation 11.**

As part of this review, the Department has evaluated the following documents:

- April 12, 2010 letter from Dan Mosley with The Strainrite Company and attachments.
- June 15, 2010 letter from Peter Brown with The Strainrite Company and attachments.
- January 2009 Inter Basic Resources Inc. (IBR) Report for the Aqua-Maxx PFA and Aqua-Maxx FFA filter under NSF Standard 53 cyst reduction challenge test
- The WuXi AppTec February 2010 Certificate of Compliance with U.S. Pharmacopeia Convention (USP) Class VI Biological Reactivity tests for the Aqua-Maxx PFA and Aqua-Maxx FFA filters to be used in the medical products industry.
- US FDA Code of Federal Regulations (CFR) Title 21, compliance statements from materials utilized in the Aqua-Maxx PFA and Aqua-Maxx FFA fabrication.

Any addenda that will modify the module must be submitted to the Department for review and acceptance prior to use in Colorado by a regulated public water system. This requirement includes any changes made to the filter materials of construction and associated interfaces with process piping. The Department will review any additional third party verification reports and issue a revised acceptance letter if appropriate.

Table 1. Strainrite Aqua-Maxx Filter Element Series Filters Technical Specifications and Conditions of Acceptance:

Technical Specifications	
Filter Model	Strainrite Two Stage Aqua-Maxx Filtration System: Aqua-Maxx PFA (Prefilter) and Aqua-Maxx FFA (Final Filter)
Maximum Flow Rate	50 gallons per minute
Maximum Differential Pressure for Cartridge Change out	18 pounds per square inch differential (psid) <u>total</u> across both filters
Turbidity Performance Standards	< 1 NTU 95% of the time - Never to exceed 5 NTU
Vessels	
Models	Strainrite AQ2-2 Vessel manufactured after January 1, 2007 with AQB-Perf Basket. Note: Some AQ2-2 vessels produced between June 1, 2006 and December 31, 2006 may be of the same design (Contact Strainrite).
Vessel Design	
Materials	304 Stainless Steel
Pressure Requirements	Rated for 150 pounds per square inch (PSI).
Pretreatment	
No pre-ozonation may exist prior to Strainrite Aqua-Maxx Hybrid Filter Element Series.	
Free chlorine concentration prior to Strainrite Aqua-Maxx Hybrid Filter Element Series cannot exceed 0.5 mg/L unless written confirmation from The Strainrite Company and/or an authorized Strainrite representative is provided to the Department with the design submittal.	

Prefilters	
Prefilter Models	A gross prefiltration unit is required for the two stage Strainrite Aqua-Maxx Hybrid Filter Element Series (Aqua-Maxx PFA and Aqua-Maxx FFA) compliance filters. Strainrite models ARITP2P-EVP, AR-TPF-B, Aqua-Maxx-EC, and Aqua-Maxx-TPF are accepted as prefilters. Any prefilters not listed above will be considered in a case-by-case basis.
Additional Operations and Maintenance Criteria	
<ol style="list-style-type: none">1. Each public water system must keep a record daily routine pressure differential readings and filter change outs. The document must be available for review by the Department upon request.2. An Operations and Maintenance (O&M) Manual must be provided for all installations including a protocol for filter change out to ensure sanitary conditions and good filter installation practice.3. Spare Parts: One (1) space Cover-o-Ring Seal for the AQ2-2 must be kept onsite.	

Please direct any further correspondence regarding this acceptance to:

Tyson Ingels, P.E.
Colorado Department of Public Health and Environment
Water Quality Control Division
4300 Cherry Creek Drive South
Denver, CO 80246

If you have any questions or comments, please call Tyson Ingels at 303-692-3002.

Sincerely,

Tyson Ingels, P.E.
Lead Drinking Water Engineer
Engineering Section
Water Quality Control Division
Colorado Department of Public Health and Environment

cc: Dennis W. Smith, ProWest Filtration, Inc.