

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

May 23, 2014

Isabelle Duchemin
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Polymem
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31320 Castanet-Tolosan
France

Subject: Acceptance of the Polymem 120 S2 Membrane Module as an Alternative Filtration Technology to meet the *Colorado Primary Drinking Water Regulations* requirements for *Giardia lamblia* and *Cryptosporidium* Removal

Dear Ms. Guibert;

The Colorado Department of Public Health and Environment's Water Quality Control Division ("the Department") has received and reviewed the information for the Polymem 120 S2 Module 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 Polymem 120 S2 module meets or exceeds the requirements of the *State of Colorado Design Criteria for Potable Water Systems* (DCPWS) Sections 1.11, 4.3.8 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 4.1, Section 4.3.8.2 of the DCPWS. The technical specifications and conditions of acceptance for the Polymem 120 S2 Module are outlined in Table 1 as well as Section 4.3.8 of the DCPWS.

This acceptance addresses the following items:

- Polymem 120 S2 Module

This acceptance applies only to the Polymem 120 S2 Module and does not constitute construction approval for installation at any public water system. Each individual submittal to the Department must demonstrate conformance with Section 4.3.8 of the DCPWS for each installation of the filters. **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:

- WesTech AltaFilter Challenge Test Report Submitted by WesTech Engineering, Inc. completed in 2007
- Environmental Technology Verification Report from the EPA for the Polymem UF 120 S2 Ultrafiltration Membrane Module completed in May 2003

- Conditional Letter of Acceptance of Polymem UF 120 S2 Membrane as an Alternative Filtration Technology issued by the Department of Health Services of the State of California in July 2003
- NSF International Standard 61 compliance statement for the Polymem UF120 Membrane Filtration Element
- Production and Integrity Testing for Two (2) Membrane Modules Sharing an Inlet and Outlet Pressure Transmitter Letter received by WesTech in July 2011

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 membrane module, materials of construction, or 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: Toray HFU-2020N Technical Specifications and Conditions of Acceptance

Filter Manufacturer	Polymem
Filter Model	120 S2
Maximum Flux (gfd -gallons per sq. ft. per day) @ 20 °C	27
Maximum Flux (gfd) @ 1 °C	15.4
Max Transmembrane Pressure lbs per square inch differential (psid)	29
Maximum Inlet Pressure – lbs per square inch gauge (psig)	36
Minimum direct integrity test pressure (starting pressure)	14 psig
Direct integrity testing failure criteria	>2.64 psig per minute decay – per WesTech protocol
Prefiltration	200 micron pre-screen
Additional Operations and Maintenance Criteria	
<ol style="list-style-type: none"> 1. If a filter fails an integrity test, the filter must be removed from service immediately and replaced with a functional filter or repaired prior to being returned to operation. 2. The public water system must keep records of the following operational parameters (available for Department review): <ol style="list-style-type: none"> a. Integrity test date, results (pass or fail), and initials of person performing the test b. Clean in place (CIP) dates with clean water permeability and integrity test result. c. Filter maintenance and fiber repair results d. Filter replacement date and reason for replacement. 3. Public water systems must maintain an operation and maintenance manual for the micro/ultrafiltration system. All integrity tests and CIP procedures must follow manufacturer prescribed procedures. 	

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Please be aware that any point source discharges of water from treatment facilities are potentially subject to a discharge permit under Colorado's State Discharge Permit System. Any point source discharges to state waters without a permit are subject to civil or criminal enforcement action.

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