

Client: ..... SPECTRUM  
 Samples: PPG-0.45-10EGS Filter Cartridge BCS 1306063 and  
 Analysis Parameter: 1306064 3.0 µM Fluorescent Latex Microspheres as  
*Cryptosporidium parvum* Oocyst Surrogate  
 Performed and Analyzed by: Stargel, MPH; July 10- July 11, 2013.  
 Test Standard: NSF 53-2011 section 7. Mechanical Filtration using General Test  
 Water (GTW) Challenge (< 1.0 NTU water)

Water Sample	3.0 µM Fluorescent Microspheres <sup>1</sup>			
	Units / milliliter			Average Percent Removal
	Filter Influent	Filter Effluent A BCS 1306063	Filter Effluent B BCS 1306064	
Initial filter performance (following 161 liters GTW)	2.1 x 10 <sup>3</sup>	None Detected < 0.001	None Detected < 0.001	>99.99996%
Following 3 Cycles (following of 485 liters GTW)		None Detected < 0.001	None Detected < 0.001	>99.99996%
Following 8 Cycles (following 1478 liters GTW)		None Detected < 0.001	None Detected < 0.001	>99.99996%

<sup>1</sup> Three micron green fluorescent latex microspheres (Fluoresbrite® YG Microspheres 3.00µm, PolySciences Inc. PA, USA) were used as surrogates for *Cryptosporidium* oocysts. It is used to determine filter's parasitic removal efficacy. The microspheres were enumerated by fixing onto SingleSpot Slides (IDEXX, USA) and viewing by UV fluorescence microscopy.

\*Provided filter was placed in a 10" cartridge holder. Latex fluorescent microspheres were added to 3,000 liters of City of Gainesville (Florida) tap water (pH 7.8, hardness: 121, TDS: 366, temperature 23.8°C, and NTU: 0.3). The water was thoroughly homogenized and was then passed through each of two filters using a centrifugal pump generating 59 PSI of water pressure. The flow through each filter was adjusted to 8.0 liters/min and remained relatively unchanged throughout the study. The filters were operated on a 20 minute "ON" cycle followed by a 20 minute "OFF" cycle for a total of 9 cycles. The filter effluents' were collected in a clean 1.5 liter container at the beginning of the study, at the beginning of the 4<sup>th</sup> "ON" cycle and upon start up following the 9<sup>th</sup> "OFF" cycle. The effluent samples were concentrated by membrane filtration and assayed for the microspheres as per laboratory protocol. The challenge influent water was sampled prior to the filter challenge study and at the end. The number of microspheres (units/ml) was determined and is reported as the "Filter Influent Water" and "Filter Effluent". All analysis was conducted in duplicates. The flow rate was calculated using a NIST traceable timer and a traceable meter/totalizer.



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Study data are summarized in the provided table(s). The results presented pertain only to the study conducted on the test articles/samples provided by the client (or client representative). The study was authorized and commissioned by the client. The results presented pertain only to the samples analyzed and identifier number(s) indicated. The data provided is strictly representative of the study conducted using the material/samples/articles provided by the client (or client's representative) and its (their) condition at the time of test. The study and data are obtained under laboratory conditions and may not be representative or indicative of a real-life process and/or application. Positive, negative, and neutralization controls were performed as outlined in the method and as per Good Laboratory Practices. All analyses were performed in accordance to laboratory practices and procedures set forth by our NELAP/TNI accreditation standards (ISO 17025) unless otherwise noted. BCS makes no claims with regards to the express or implied warranty regarding the ownership, merchantability, safety or fitness for a particular purpose of any such property or product.



Signature of Laboratory Director/Authorized Rep. \_\_\_\_\_ Date: July 15, 2013

