



Clean Drinking Water

One of the most significant challenges in the world today is the availability of clean drinking water. Today, a large portion of the global population is forced to drink water that is polluted with pathogens, heavy metals, pesticides and other toxic organic compounds. Against this backdrop and societal need, Molycorp Minerals began research on a material with unique chemistry that suggested broad spectrum efficacy.

XSORBX® was developed to purify the world's most heavily polluted drinking water sources. Its broad spectrum efficacy extends to pathogens such as protozoa, fungi, bacteria, and viruses; organic toxins such as nerve active pesticides and organic acids; and heavy metals such as arsenic, selenium, and chromium.

One of the most surprising aspects of XSORBX® is its efficacy against pathogens. Following a standard test protocol established by the National Sanitation Foundation (NSF), alkaline tap water was mixed with prescribed amounts of tannic and humic acid, dust and dirt, sea salts, viruses and bacteria. The mixture was then filtered through a bed of XSORBX®.

TEST PROTOCOL

NSF P248 (GTW2; Worst case):		Common Names
pH	9.0 ± 0.2	Alkalinity
Total Organic Carbon	≥10mg/L	Humic and Tannic acid
Temperature	4°C ± 2 °C	
Turbidity	≥ 30 NTU	Dust/Dirt
Total Dissolved Solids (TDS)	1500 ± 150mg/L	Sea Salts

MICROBIOLOGICAL CHALLENGE

Organism	Influent Concentration	P248 Required Removal	XSORBX TEST RESULTS
Bacteria: <i>Klebsiella terrigena</i>	106cfu/mL	99.9999%	99.9999%
Virus: MS2 / fr (50/50) combination	104pfu/mL	99.99%	99.99%

The results of the experiment show that XSORBX® met the NSF standard 6.00 log (99.9999%) removal of bacteria and 4.00 log (99.99%) removal of virus. It also removed 98% of the tannic and humic acids.

XSORBX® has also been engineered for use in portable drinking water purification systems. During this development phase XSORBX® was adapted to meet a variety of physical and mechanical challenges. Flow rate, pressure drop, capacity and kinetics goals were all exceeded in the design.

XSORBX® shows great promise as a robust and flexible media that can be developed for a broad range of applications.