Aquatic Safety

Commercial Aquariums use as much as 30 gallons of chitosan per day. They host some of the most exotic and sensitive fish species in the world, and have been using chitosan for years with no indication of aquatic toxicity.

TEST #[1]	Turbidity		pH		Aquatic Toxicity Test[2]	
	Before	After	Before	After	Trout	Daphnia
1	79.0	2.7	7.0	7.0	0.0% mortality	0.0% mortality
2	150.0	1.0	6.9	6.9	0.0% mortality	0.0% mortality
3	365.0	2.0	7.1	7.1	0.0% mortality	2.0% mortality
4	643.0	3.1	7.1	7.1	0.0% mortality	0.0% mortality

The table above shows the results of four separate chitosan treatment tests in which the water tested was treated with chitosan. Turbidity, pH and acute aquatic toxicity (for Rainbow Trout and Daphnia Magna) were reported. Under most guidelines, up to 20 percent mortality of test populations is acceptable. As shown in the table, mortality rates were insignificant.

Test Species	Chitosan LC50 Values[3]
Fathead Minnow	1,108 mg/L
Rainbow Trout	155 mg/L
Daphnia Pulex	417 mg/L

LC50 is the amount of a material demonstrated to cause death in 50 percent of the population being tested. The table above shows the LC50 values for three aquatic species.

[1]Test#1 performed on January 1, 2001 ~550 gpm flow rate.
Test#2 performed on October 31, 2000 ~550 gpm flow rate.
Test#3 performed on January 17, 2001 ~550 gpm flow rate.
Test#4 performed on March 19, 1999 ~350 gallon batch.

[2]The 96-hour Rainbow Trout acute toxicity test and the 48-hour Daphnia Magna acute toxicity test both followed Method EPA/600/4-90/027 and SQ-R-05-80. Mortality exceeding 20% for any one test indicates a failure of the test.

[3]Aquatic toxicity testing performed by Parametrix Laboratories, Bellevue, Washington.

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