



Virkon® Aquatic



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Virkon[®] Aquatic

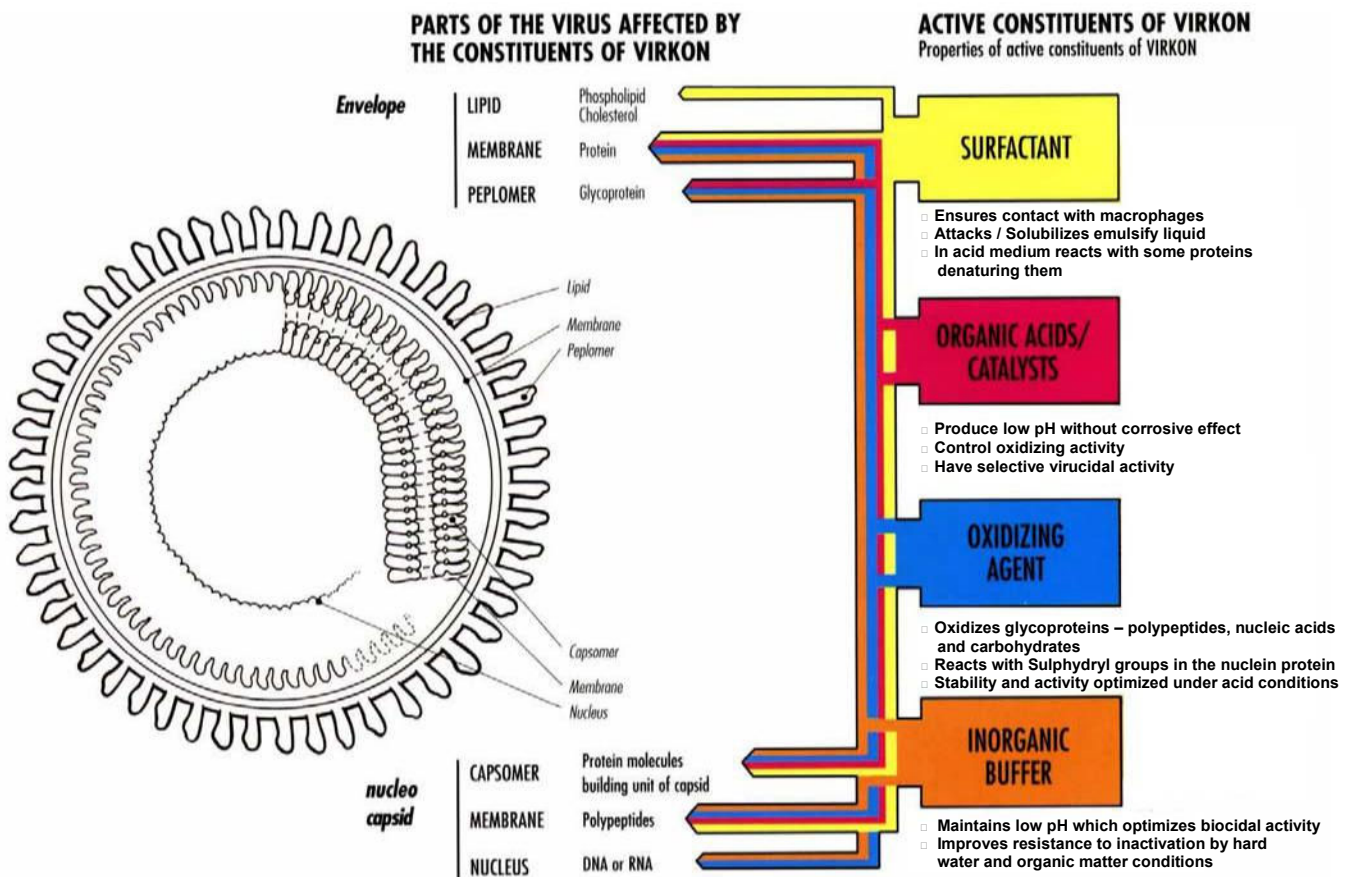
Virkon[®] Aquatic

- Fast acting
- Independently proven broad spectrum efficacy against viruses, bacteria, fungi and molds
- Non tainting
- Exceptional safety profile

Virkon[®] Aquatic is a proven veterinary disinfectant with a broad spectrum of activity against a wide range of fish disease causing organisms.

Virkon[®] Aquatic has four components which contribute to the destruction of diseases liable to affect your stock's health. The illustration below shows how each of these components acts against a virus

Magnified Virus Section



Biosecurity



An introduction to fish culture biosecurity

The intensification of fish culture provides an ideal environment in which disease-causing organisms can flourish and cause serious damage to productivity. Disease may come from any number of sources; however it originates, it spreads through recognised vectors of infection. These include fish stocks, staff and visitors, equipment, vehicles and transportation, other aquatic life, birds and animals, the aquatic environment and even the air itself.

Medication and vaccination have traditionally played a major role in treating diseases but it is now widely accepted that they cannot, in isolation, prevent losses due to disease. Intensive fish culture demands a holistic approach. Unless the background challenge from disease causing organisms can be controlled, and good management practices strictly followed, medication and vaccination alone are not capable of adequately protecting fish stocks. Fish must be given an environment in which the level of infection is controlled to the point where vaccination and medication can achieve beneficial effects. Biosecurity is the key to achieving this.

Biosecurity involves the exclusion of disease-causing organisms from the environment. This is particularly important in fish production and is achieved by the use of external and internal biosecurity barriers:

Critical Control Point	External Barrier to Establish
Incoming Water	<ul style="list-style-type: none"> <input type="checkbox"/> Use a pathogen-free water source <input type="checkbox"/> When possible select a water source free of concerns from indigenous species
Egg and Fish Movements	<ul style="list-style-type: none"> <input type="checkbox"/> Prevent movements of older fish or eggs/fish of questionable hygiene or health. <input type="checkbox"/> If in question apply appropriate quarantine procedures and diagnostics
Facility Access	<ul style="list-style-type: none"> <input type="checkbox"/> Incorporate fencing and signage. <input type="checkbox"/> Direct new deliveries and visitors away from the facility to an isolation zone
Visitors	<ul style="list-style-type: none"> <input type="checkbox"/> Provide protective clothing that undergoes designated washing and disinfection <input type="checkbox"/> Use foot baths and hand hygiene stations <input type="checkbox"/> Identify high risk people and practices
Pest and Predator Control	<ul style="list-style-type: none"> <input type="checkbox"/> Establish a predator management program as predators can spread disease and stress fish

Critical Control Point	Internal Barrier to Establish
Designated Zones or Tank Groupings	<ul style="list-style-type: none"> <input type="checkbox"/> Identify fish groups that may have an increased susceptibility or resistance and assign a risk status for each group <input type="checkbox"/> Set up isolation and disinfection procedures for these units/zones
Equipment and General Traffic Movement	<ul style="list-style-type: none"> <input type="checkbox"/> Try to move from high risk zones to lower risk zones, high to low health status, younger to older fish and from inside to outside
Sanitary measures for each zone	<ul style="list-style-type: none"> <input type="checkbox"/> Assign protective clothing for each specific zone/unit that undergoes designated washing and disinfection <input type="checkbox"/> Conveniently locate foot dips and hand hygiene stations
Equipment Concerns	<ul style="list-style-type: none"> <input type="checkbox"/> Assign separate equipment for each zone, unit or tank <input type="checkbox"/> Always start each task with disinfected equipment and disinfect equipment if moved between zones or tanks
Identify High Risk Activities	<ul style="list-style-type: none"> <input type="checkbox"/> Remove sick and dead fish carefully and dispose of correctly to avoid cross-contamination <input type="checkbox"/> Establish an area for service providers to work and clean equipment

Disinfectant Considerations



The correct selection and application of disinfectants is very important and ensures that any pathogen challenge is minimised, maximising the fish's natural defence against infection. This in turn will dramatically reduce incidences of disease, reducing mortality and saving you money. There are three key factors that must be considered when selecting a disinfectant for hatchery biosecurity, these are:

- **Proven Efficacy**
- **Environmental Impact**
- **Operator Safety**

Proven efficacy

Not all disinfectants are effective against the wide range of viral, bacterial and fungal disease causing organisms that affect fish culture. Even disinfectants with similar chemistry can have widely different spectra of activity and effective dilution rates. Selecting a disinfectant is therefore very important. Viral disease agents such as Infectious Pancreatic Necrosis Virus (IPN) and Infectious Salmon Anaemia Virus (ISA) are extremely persistent and difficult to destroy. The disinfectant must have independently proven efficacy against a wide range of fish pathogens and be effective in low concentrations and at low temperatures.

Environmental impact

As well as being effective, it is important that the disinfectant causes no harm to the environment in which it is being used. Virkon[®] Aquatic represents a low hazard to the environment. Therefore, unlike most other disinfectants where strict discharge controls are essential, use of Virkon[®] Aquatic will not constrain your daily activities.

Operator safety

Given the exposure limits and dangers associated with the use of some disinfectants, particularly those based on glutaraldehyde and formaldehyde, consideration must be paid to operator safety. Virkon[®] Aquatic has no occupational exposure limits and at a 1% in use dilution is classified as non-irritant to skin and eyes. Virkon[®] Aquatic provides complete control for all aspects of fish culture biosecurity.



Biosecurity Tasks



Key biosecurity tasks

Biosecurity plays an important part throughout every stage of the life cycle of a fish, from hatching through to processing. Thorough cleaning is an essential precursor to any effective disinfection process to maximise the benefits of Virkon® Aquatic. The following table indicates the specific key biosecurity tasks, which will have the greatest impact on controlling the spread of disease.

	Dilution rate	Application rate
Virkon® Aquatic	1:200 (0.5%)	300 mls per square metre

Key biosecurity task	Critical control point	Application	Frequency
Well boats	Deck	Clean thoroughly, rinse with clean water then disinfect with Virkon® Aquatic	On a daily basis after use
	Wells Equipment Pumps		
	Protective clothing	Rinse with clean water immerse in Virkon® Aquatic for 10 mins and hang to dry	Daily or as required
	Boat hull	Disinfect routinely with Virkon® Aquatic when docked	Refer to official guidelines
Work boats and other vessels	Decks and bilges	Clean thoroughly, rinse with clean water then disinfect with Virkon® Aquatic	Daily or as required
	Equipment Harvesting equipment		
	Protective clothing	Rinse with clean water immerse in Virkon® Aquatic for 10 mins and hang to dry	Daily or as required
	Foot dips	Fill with a freshwater solution of Virkon® Aquatic at a dilution rate of 1:100 (1%)	Replenish every 4 days or when heavily soiled
Diving teams	Diving suit	Remove any organic debris by brushing then immerse all items in Virkon® Aquatic solution for 20 mins then rinse with clean water	On completion of operation
	Equipment Mort bags		
Harvesting	Equipment	Clean thoroughly, rinse with clean water then disinfect with Virkon® Aquatic	Daily or as required
	Bins and lids Stacker boxes		

Biosecurity Tasks

Routine biosecurity tasks

The following table displays additional routine biosecurity tasks required for a complete biosecurity program.

	Critical control point	Product	Dilution rate	Application rate	Frequency
Vehicle disinfection program					
Broodstock / hatchery Freshwater Production Seawater Production	Vehicles	Virkon® Aquatic	1:200	All vehicles entering site should pass through a wheeldip filled with solution of Virkon® Aquatic. For high risk situations please refer to your Virkon® Aquatic supplier	On arrival
Hygiene system					
Broodstock / hatchery Freshwater Production Seawater Production	Footdips	Virkon® Aquatic	1:100	Place footdips at all entrances, piers and cages. Fill with a freshwater solution of Virkon® Aquatic at a dilution rate of 1:100 (1%)	On passing through area
Broodstock / hatchery Freshwater Production Seawater Production	Protective clothing	Virkon® Aquatic	1:100	Rinse with clean water immerse in Virkon® Aquatic for 10 mins and hang to dry	After each period of use
Equipment					
Broodstock / hatchery Freshwater Production Seawater Production	Transport tanks & equipment	Virkon® Aquatic	1:200	Visibly clean	After each period of use
Broodstock / hatchery Freshwater Production	Hand nets, weighing equipment	Virkon® Aquatic	1:200	Visibly clean	After each period of use
Freshwater Production	Dip nets & tank brushes	Virkon® Aquatic	1:200	Immersion	After daily use
Freshwater Production	Vaccination equipment stage 1	Virkon® Aquatic	1:200	Clean then disinfect thoroughly with Virkon® Aquatic solution	Between year classes and farm sites
Freshwater Production	Vaccination equipment stage 2	Virkon® Aquatic	1:50	Flush with Virkon® Aquatic solution, leave for 5 mins, then thoroughly rinse with clean water	Between tanks and farm use
Broodstock / hatchery Freshwater Production Seawater Production	Grading equipment	Virkon® Aquatic	1:200	Clean then disinfect thoroughly with Virkon® Aquatic solution	Daily after use
Broodstock / hatchery Freshwater Production Seawater Production	Tanks	Virkon® Aquatic	1:200	Clean then disinfect thoroughly with Virkon® Aquatic solution	When empty

Virkon[®] Aquatic efficacy against specific fish pathogens

Virkon[®] Aquatic has been tested against a wide range of viruses and bacteria. The following table summarizes the data for pathogens of particular importance to fish culturists

Infectious	Fish Disease	Test Organism	Effective Dilution	Independent test institution	Test method and temperature
Virus					
ISA virus	Infectious Salmon Anaemia	Infectious salmon anaemia (ISA) virus	1:200	Atlantic Veterinary of PEI, Canada Molecular Biology Group, Canada	20°C and 10 minute contact time
			1:100		15°C with blood / mucus challenge
IPN Virus	Infectious pancreatic necrosis	Infectious pancreatic necrosis birnavirus	1:100	National Veterinary Institute, Norway	4°C with 1% bovine albumin organic challenge and 10 minutes contact time
		Infectious pancreatic necrosis birnavirus	1:500	National Veterinary Institute, Norway	4°C with no organic challenge and 1 minute contact time
Rhabdovirus	Infectious Hematopoietic Necrosis, Viral Haemorrhagic Septicaemia, Spring Viraemia of Carp	Snakehead rhabdovirus Strain 19	1:1000	Institute of Aquaculture, University of Stirling, Scotland	20°C in cell culture fluid and 15 minute contact time
		Snakehead rhabdovirus Ban Pako Strain	1:1000	Institute of Aquaculture, University of Stirling, Scotland	20°C in cell culture fluid and 15 minute contact time
		Spring viraemia of carp rhabdovirus	1:1000	Aquaculture/Fisheries Centre, University of Arkansas at Pine Bluff	UK DEFRA method - 4°C, 1% calf serum and 30 minutes contact time
Bacteria					
Aeromonas hydrophila	Generally secondary invader	Aeromonas hydrophila	1:200	National Veterinary Institute, Finland	Modified Kelsey- Sykes
Aeromonas salmonicida	Salmon furunculosis, Trout ulcer disease	Aeromonas salmonicida subsp salmonicida	1:200	National Veterinary Institute, Norway	Modified EN1276 (test temperature 4°C against an organic challenge of 1% bovine albumin and 1% yeast)
		Aeromonas salmonicida subsp salmonicida	1:1000	The Veterinary Institute, Division of Fish, Sweden	EN1656
		Aeromonas salmonicida subsp salmonicida	1:200	National Veterinary Institute, Finland	Modified Kelsey-Sykes
		Aeromonas salmonicida subsp achromogenes	1:200	National Veterinary Institute, Finland	Modified Kelsey-Sykes
Pseudomonas aeruginosa		Pseudomonas aeruginosa ATCC15442	1:100	USA	AOAC protocol+F404
		Pseudomonas aeruginosa NCIMB 10421	1:100	USA	AOAC DIS/TSS-1
Pseudomonas anguilliseptica		Pseudomonas anguilliseptica	1:100	The Veterinary Institute, Division of Fish, Sweden	EN1656
Renibacterium salmoninarum	Bacterial Kidney Disease	Renibacterium salmoninarum	1:100	The Veterinary Institute, Division of Fish, Sweden	EN1656
Vibrio anguillarum		Pseudomonas anguilliseptica	1:100	The Veterinary Institute, Division of Fish, Sweden	EN1656
Yersinia ruckeri	Enteric Redmouth Disease (ERM)	Yersinia ruckeri	1:100	National Veterinary Institute, Norway	Modified EN1276 (test temperature 4°C against an organic challenge of 1% bovine albumin and 1% yeast)
		Yersinia ruckeri stereotype 1	1:100	The Veterinary Institute, Division of Fish, Sweden	EN1656

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