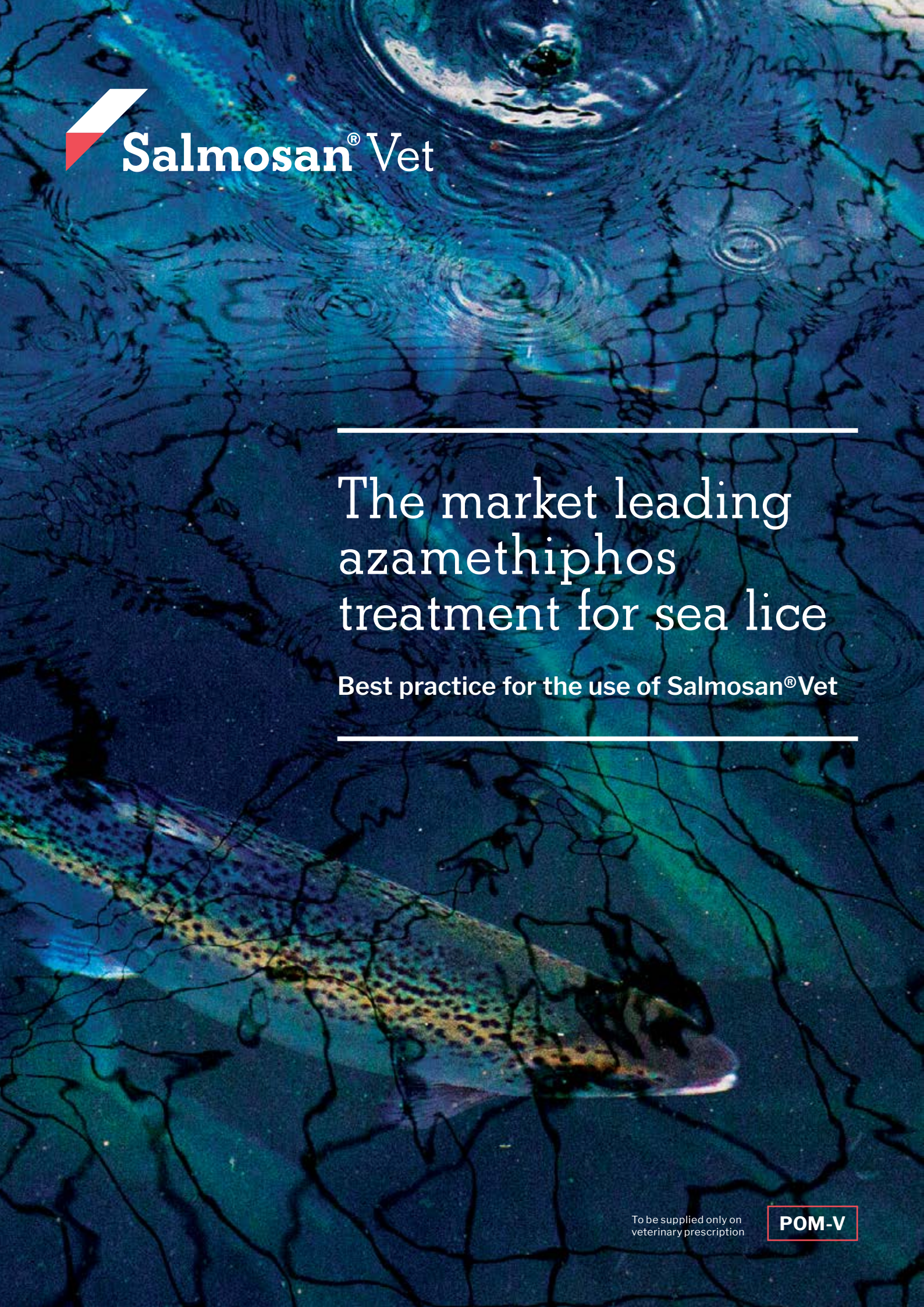
Salmosan® Vet
The market leading azamethiphos treatment for sea lice
Best practice for the use of Salmosan®Vet
To be supplied only on veterinary prescription
POM-V

Effective, Flexible and Economical

INTRODUCTION

In the fight to manage sea lice, your operation looks to a reliable and proven option which delivers effective treatment as part of a strategic de-lousing programme.

Through working alongside salmon producers and understanding the needs of every stage in the supply chain, Salmosan®Vet has been continuously developed to become the market leading azamethiphos solution.

Salmon louse is a common term referring to different sea lice attaching to the skin of salmonids. Depending on location, the species will differ, but the common denominator is that they can rapidly reproduce in high amounts and be harmful for the fish.

Under farming conditions, the increased number of available hosts combined with high reproductive potential, implies that we need to control sea lice to ensure optimal fish welfare. To control sea lice, we can use a variety of different approaches. Among these are bath treatments.

Salmosan®Vet is an approved veterinary medicine used globally since 2009 to control sea lice. It is recognized as a sustainable, gentle and effective treatment option, with the active ingredient azamethiphos. Bath treatments should form a part of an integrated pest management program, where a combination of pharmaceuticals, pesticides, as well as non-medicinal and biological methods are included to avoid the build-up of resistance in the sea lice population.

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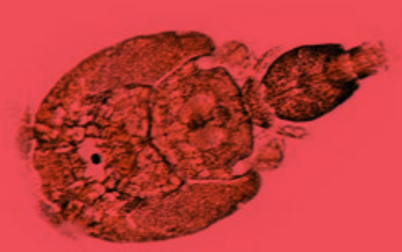
Detailed and long-term planning together with early intervention is the key for effective sea lice control.



Best practice for the use of Salmosan®Vet

The aim of this document is to provide advice on best practices when treating with Salmosan®Vet.

We hope you find it useful and informative; please feel free to send us any comments or suggestions.

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How to ensure optimal results from bath treatments

Delousing activities should form part of an organised rotation programme and be conducted in a synchronized manner within a management area.

Plan treatments for when the majority of the sea lice population are in the mobile stages.

Reducing metabolism through starving prior to treating has shown to be beneficial for the fish and water quality during the treatment. Therefore, we recommend starving the fish prior to treatment until a notable reduction in gut content has been visually confirmed.

The week before treating, collect a sample of sea lice and carry out a sensitivity test to provide an indication of the expected effect.

Prior to starting the treatment procedure, ensure access to enough protective equipment for all participants.

Ensure optimal environmental conditions prior to and during the treatment, utilising calibrated monitoring equipment.

Oxygen levels should be kept above 90% saturation.

CO_2 should not surpass 30mg/l and the pH-level should be above 6.5.

Investigate and follow your local guidelines regarding discharge of Salmosan®Vet to the environment.

Fish welfare should be evaluated prior to, during and after the treatment.

Suggestions for welfare scoring can be found in the FISHWELL report from NOFIMA.

Always read the SPC and follow local guidelines.

DURING MIXING AND TREATMENT

The SPC and Material Safety Data Sheet (MSDS) should always be easily accessible to treatment personnel. Treatment staff should have complete knowledge of these key documents.

Wear

Suitable protective clothing (waterproof coveralls), gloves and face protection.

Train

Treatment personnel in the use of the product.

Check

With your treatment personnel if they have been advised by medical professionals not to work with organophosphates, or if they have previously felt unwell after using Salmosan®Vet. If so, do not let them carry out the treatment.

Depending on the amount of exposure to azamethiphos, blood samples should be taken and analysed for cholinesterase enzyme activity regularly. Consult a medical professional for precautionary medical advice.

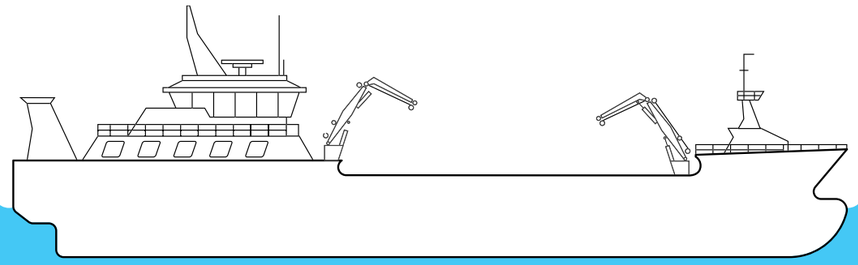
DOES THE BOAT HAVE MIXING TANKS?

YES
Follow the wellboat procedure to mix the solution

NO
Use the tarpaulin procedure to mix the solution

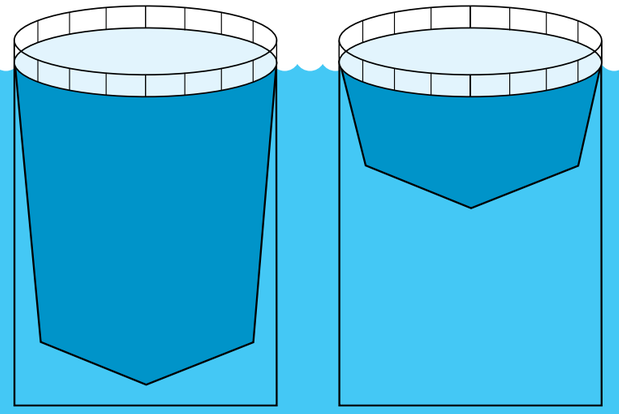
Wellboat

- A well-boat with filters to remove sea lice is advisable to reduce resistance development in the sea lice population
- Salmosan®Vet is delivered in water soluble pouches. On the day of treatment:
  - To get the correct dosing, 0.2g should be added per cubic meter of water (0.2g/m^3 water)
- Agree with the well-boat captain about the optimal fish stocking density
- Before treatment, let the fish settle in the well for at least 30 minutes or until they are calm after crowding and pumping
- Minimum 30 minutes prior to treatment, add the calculated amount of Salmosan®Vet to the mixing tanks
- Fill the mixing tanks to maximum level with saltwater and start mixing (minimum 30 minutes mixing)
- If there are any delays, continue to keep the product mixing to avoid it settling
- After mixing, add the treatment solution to the well, be mindful to flush the mixing tank to ensure that all the Salmosan®Vet is transferred into the well
- Start timing when all the Salmosan®Vet is transferred into the well
- Maximum recommended treatment time is 60 minutes



Tarpaulin

- Make sure your cage's net is clean, enabling good water circulation
- If cages onsite are aligned in a row, always treat alternate cages to prevent sub-lethal exposure to the lice
- Salmosan®Vet is delivered in water soluble pouches
  - To get the correct dosing, 0.2g should be added per cubic meter of water (0.2g/m^3 water)
- On the day of treatment ensure that the Salmosan®Vet is mixed with freshwater in advance (i.e. 1 ltr per 200g Salmosan®Vet). Shake this stock solution for 5 minutes
- The diluted solution of Salmosan®Vet should be further diluted into at least 200 litres of sea water and gently stirred for 5 minutes
- Carefully add the treatment solution into the cage ensuring maximum and homogeneous dispersion in the cage. Try to avoid 'hot spots'
- Start timing when all the Salmosan®Vet is transferred
- Maximum recommended treatment time is 60 minutes



Note

Remember to have vigorous oxygenation during the treatment and ensure that there are no blind spots.

Post treatment

Do not feed fish until the next day, even if the fish accept feed.

Withdrawal period for human consumption is 10-degree days after treatment.

Count sea lice immediately before and after treatment to give an indication of effect. Then again between 48h and 72h following the treatment (based on water temperature) in order to evaluate the full effect. It can take some time before the sea lice fall off fish due to the target mechanism.

ALL unexpected events during the treatment must be reported to Benchmark and logged as a PV-case e.g suspected lack of expected efficacy or increased mortalities.

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Benchmark would greatly appreciate your reports of treatment effect, this allows us to keep on top of resistance development and continually improve. If possible please send sea lice counts prior and after the treatment to:

salmosanvet@bmkanimalhealth.com

Example treatment checklist

Things to think about before you begin the treatment

Checklist				
Treatment Plan				
				Comment:
Size:				
Treatment vessel/tarp				
Treatment volume:				
Pens to be treated:	Pen no:			
Dosing (in g)				
Ordered quantum:				
Starting date:				
Tentative end date:				
Responsible vet:	Name:	Phone:		
Pre-treatment				
		YES	**NO**	**Comment:**
Is there a satisfying work schedule for the full treatment period?				
Who is responsible on each shift?		Name:		
Is there radio contact between all involved parties?				
Has a risk assessment been created and read by all involved?				
If YES please comment				
Special considerations on welfare?				
Special considerations on fish health?				
Special considerations on environmental aspects?				
Have you removed dead fish today?				
Has cleanerfish been removed form the pen?				
Approximate amount of cleanerfish before/after removal		Before:	After:	
Is there a minimum of 2 calibrated oxygen sensors available?				
Is equipment to ensure good oxygenation ready?				
Is camera and ROV available during treatment?				
Has the pen been inspected prior to operation start?				
Is all needed equipment for crowding/tarpaulin ready and available?				
Avg. Lice count:		Attached:	Mobile	Adult female
Pen:				
Pen:				
Pen:				
Pen:				
Pen:				

Treatment			
	YES	**NO**	**Comment**
Will the prescriber be available at the start of the treatment?			
Has the Salmosan®Vet arrived at the site?			
Exposure time of Salmosan®Vet to fish	Minutes:		
Is there a plan for dosing Salmosan®Vet to the treatment unit?			
Will Aqui-S be used during the treatment? If yes, what dose?			
If Aqui-s is an option, do you have defoam ready?			
Has fish welfare been evaluated before the treatment?			
Criterias for aborting the treatment			
How is the weather report for the full treatment period?			
Has the site a history of struggling with weather/currents?			
Is there abnormal behaviour before/after the treatment?			
Considerate amount of moribund fish during the treatment?			
Acute mortality during the initial treatment?			
Minimum allowed oxygen level:	Min:		
Maximum allowed CO_2 level:	Max:		
Lowest/highest allowed pH:	Low:	High:	
Post-treatment			
	YES	**NO**	**Comment**
Did you have to abort the treatment?			
How was the immediate effect of the treatment?			
Was there mortalities associated with the treatment?			
If increased mortality has the veterinarian been informed?			
If increased mortality been reported to the authorities?			
If increased mortality has it been reported to Benchmark?			
How was the long-term effect of the treatment?			

Useful contacts

EUROPE

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Benchmark® Animal Health

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