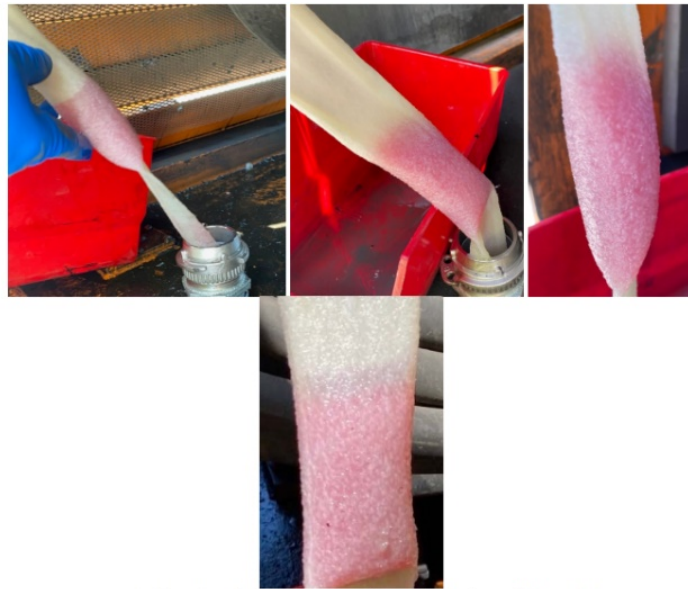


Aqua Fighter

Manual

AquaFighter Finger Filter/ AquaFighter Canvas/ AquaFighter DipStick
AquaFighter Snake Filter



Doc.-No. : **Aqua Fighter**

Version : 1.0

Date of Issue : 18.03.2021

Manufacturer / distributor:
HUEGLI TECH Switzerland
Murgenthalstrasse 30
4900 Langenthal

First note page 14 This document, and the information contained herein is the intellectual property of HUEGLI TECH. It is to be used only in conjunction with the specific system or the specific equipment for which it was meant, and may not be used for any other purpose. The copyright has been applied to every page. We reserve all rights for this document, also in the event of application for patents or registry of patterns or designs. None of the information contained herein may be disclosed to third parties, nor may it be reproduced, copied or transmitted in any way, shape or form, or by any means, electronic, mechanical, or otherwise, without the prior written permission of HUEGLI TECH.

Unless otherwise stated, masculine nouns and pronouns do not refer exclusively to men.

All trademarks used in this document are properties of their respective owners.



AquaFighter Finger Filter

This instruction manual applies to AquaFighter Finger Filter suitable for diesel fuel tanks on e.g. trucks, buses, pleasure boats, tractors and construction machinery.

To achieve the maximum performance of your AquaFighter Finger Filter, it is important that the following instructions are followed closely.

**Please note that the Aqua Fighter product should not be used in gasoline tanks.
About AquaFighter FingerFilter**

In today's highly efficient diesel engines, fuel injection systems often operate at 2,000 bar (30,000 psi) or even higher. In such extreme conditions water is your enemy #1. AquaFighter is there to protect you high value diesel powered equipment.

In the past, water finding pasta was used to detect water in diesel tanks. However, as biodiesel has been introduced in almost all diesel qualities, this has rendered pasta an unreliable method for water detection. In addition, biodiesel is significantly more hydroscopic than fossil diesel increasing the probability of water related fuel challenges compared to previous years.

Aqua Fighter FingerFilter are unique products intended to provide the user with a reliable indication on whether the diesel fuel tank has excessively high levels of water in it. In addition, AquaFighter FingerFilter have a certain capacity to remove water from the fuel. AquaFighter FingerFilter remove not only water in a free phase but also water that is either finely dispersed or even dissolved in the fuel. When using AquaFighter products, it will be possible to reduce the water content of diesel down to an acceptable level, i.e. water content below 200 mg/kg (200 ppm by mass) according to the European diesel specification EN590 (the maximum water and sediment content in ASTM D975 is 0.05 percent volume equal to 500 ppm by volume)

It should however be noted, that water is absorbed faster in warm conditions and significantly slower when the climate is cold. Hence, longer working time should be allowed during cold periods and winter. Diesel that is not clear and bright at room temperature will in most cases have a too high-water content according to the standards and hence the engine manufacturers' requirements. Traditionally, "cloudy" diesel has been delivered as special waste, but with AquaFighter products it is now possible to remove the excess water and bring the contaminated diesel back on spec. Another important factor is that microbes rely on water to live and multiply. By removing unacceptable amounts of water in the diesel, the "basis of life" for the microbes will be removed. Consequently, the risk of microbial blooms in diesel storage tanks where AquaFighter is used is minimized. Avoiding microbes significantly reduces the risk of diesel filter clogging - without the use of hazardous biocides.

How to use AquaFighter Finger Filter

AquaFighter Finger Filter consists of a "bag" with a high-tech water-absorbing material that can absorb approximately 500 times its own weight with water. At one end of AquaFighter Finger Filter, a solid cord in fuel-resistant synthetic fiber material is attached. The cord should be used to lower into - and retrieve the AquaFighter Finger Filter from the tank. Always make sure that the cord is not harmed or broken before use.

HIGH IMPORTANCE

The AquaFighter products should never be lowered in a tank unless you are able to retrieve it using the cord attached.

Always hold the cord in one end when lowering the AquaFighter product k into the tank. The cord is used to retrieve AquaFighter product from the tank. It is therefore *VERY IMPORTANT* to ensure that the end of this cord is available. It is recommended to secure the chord e.g. by making a loop around the filler pipe or inspection pipe. Hence, the cord must at all times be accessible from outside of the tank and allowed to run all the way down to the bottom of the tank where the AquaFighter product should be allowed to rest to do its job.

Common to fuel tanks on vehicles, construction machinery and recreational boats is that they have an infrastructure with float and possibly fuel pump("feed pump"). To prevent AquaFighter FingerFilter from conflicting with this infrastructure, DieselCare *strongly recommends to only keep AquaFighter FingerFilter in the tank when the vehicle, machine or boat is not in operation*. It is further highly recommended to make sure that AquaFighter FingerFilter remain in the tank continuously outside operating hours and that it is regularly inspected for water absorption.

Procedure for use on vehicles, machines, pleasure boats, etc.

1. Remove the Aqua Fighter FingerFilter from the airtight bag it is delivered in and lowered into the tank. **IMPORTANT**; take care of the bag as this shall be used to contain the used AquaFighter according to section 2 and 3 below. Ensure that sufficient piece of cord is available outside the tank, so it can be attached, e.g. by making a loop around the filler pipe.
2. *Before starting up the engine, machine, vehicle or boat, AquaFighter FingerFilter must be removed from the tank, inspected for water content (see detailed description in section 4 below) and placed back in the airtight bag. Use gloves and other adequate protective equipment to avoid contact with skin or eyes and allow the AquaFighter to drip off excess diesel before placing it in the bag. In case of diesel spills and/ or diesel get in contact with the skin or eyes, the procedures described in the diesel material safety data sheet (MSDS) must be followed.*
3. After completing the operation of the boat, vehicle or machine, e.g. at the end of the working day, AquaFighter may again be removed from the airtight bag and lowered into the diesel tank while securing the cord as described in section 1 above. AquaFighter will then continue absorbing any water that may have entered the tank during the day or trip.

4. Inspection of AquaFighter FingerFilter: When more than 50% of AquaFighter absorbent bag inside the unit has turned red, it must be replaced. Used AquaFighter bags must be put in a suitable container, e.g. the supplied plastic bag and delivered at an approved collection point such as the local recycling center. Used AquaFighter absorbent bag will consist mostly of water, but small amounts of diesel can remain, and it should therefore be treated in the same way as waste oil and fuel residues and may be a special, universal or hazardous waste and should be disposed in accordance with all applicable state, federal and local laws in the area of use.

When using AquaFighter Finger Filter for the first time, there may be some free water in the tank and water dissolved in the diesel that will be removed and consequently it is not unlikely that the AquaFighter will reach its maximum limit of 50% red color already after the first storage in the tank. This is considered to be quite normal and eventually it will take longer and longer between each time it is necessary to replace it with a new AquaFighter Finger Filter absorbent bag. This simply means that the diesel in your tank has reached a level where water is no longer at harmful levels and the basis for microbe to grow is removed.

Aquafighter Canvas

This instruction manual applies to AquaFighter Canvas suitable for above and underground diesel storage tanks from approx. 1000 liters (1 m³)/250 US Gallons up to approx. 50,000 liters (50 m³)/15,000 US Gallons To achieve the maximum performance of AquaFighter Canvas, it is important that the following instructions are followed closely.

Please note that this user manual is applicable to stationary tanks and not tanks on a vehicle or movable machine.

Also note that the AquaFighter product should not be used in gasoline tanks.

About AquaFighter

In today's highly efficient diesel engines, the fuel injection systems often operate at 2,000 bar (30,000 psi) or even higher. In such extreme conditions water is your enemy #1. AquaFighter is there to protect your high value diesel powered equipment.

AquaFighter is a unique product that removes not only the free water phase which can form in a diesel storage tank. AquaFighter also removes water that is in a free phase, finely dispersed or even dissolved in the fuel. When using Aqua Fighter, it may be possible to reduce the water content of diesel down to an acceptable level, i.e. water content below 200 mg/kg (200 ppm by mass) according to the European diesel specification EN590. The maximum water and sediment content according to ASTM D975 is 0.05 percent volume equal to 500 ppm by volume. It should however be noted, that water is absorbed faster in warm conditions and significantly slower when the climate is cold. Hence, longer working time should be allowed during cold periods and winter.

Diesel that is not clear and bright at room temperature will in most cases have a too high water content according to the standards and hence the engine manufacturers' requirements. Traditionally, "cloudy" diesel has been delivered as out of spec, but with AquaFighter it is now possible to remove the excess water and bring the contaminated diesel back on spec.

Another important factor is that microbes rely on water to live and multiply. By removing unacceptable amounts of water in the diesel, the "basis of life" for the microbes will be removed. Consequently, the risk of microbial blooms in diesel storage tanks where AquaFighter is used is minimized. Avoiding microbes significantly reduces the risk of diesel filter clogging - without the use of hazardous biocides.

How to use AquaFighter Canvas

AquaFighter consists of a Canvas with a high-tech water-absorbing material that can absorb approximately 500 times its own weight with water. At one end of the

AquaFighter Canvas, a solid cord in fuel-resistant synthetic fiber material is attached. Always make sure that the cord is not harmed or broken before use.

HIGH IMPORTANCE

The AquaFighter Canvas should never be lowered in a tank unless you are able to retrieve it using the cord attached.

Always hold the cord in one end when lowering the canvas into the tank

The cord is used to retrieve AquaFighter from the tank. It is therefore *VERY IMPORTANT* to ensure that the end of this cord is available. It is recommended to secure the cord by e.g. making a loop around the filler pipe or manhole cap. Hence, the cord should at all times be accessible from outside of the tank and allowed to run all the way down to the bottom of the tank where the

AquaFighter Canvas should be allowed to rest to do its job.

Aqua Fighter Canvas can remain in the tank continuously but regular checks for water absorption (e.g. once a month) is highly recommended.

Procedure for use on storage tanks

1. Carefully remove Aqua Fighter Canvas from the airtight bag. Lower AquaFighter Canvas into the tank. **IMPORTANT**; take care of the bag as this shall be used to contain the used AquaFighter (see section 3 below).
2. Ensure that enough cord is available outside the tank so that it can be attached, e.g. by making a loop around the filler pipe, manhole cover or other suitable places.
3. Inspection and replacement of AquaFighter Canvas

Inspection: AquaFighter Canvas must be inspected regularly, e.g. monthly for water content/ water absorption. When handling AquaFighter Canvas and there is a risk of diesel exposure, gloves and other adequate protective equipment should be used to avoid contact with skin or eyes. If less than 50% of the AquaFighter Canvas has turned red, it can be returned to the tank. If more than 50% of the AquaFighter Canvas has turned red, replacement is recommended (see "Replacement" below). In case of diesel spills and/ or diesel get in contact with the skin or eyes, the procedures described in the diesel safety data sheet must be followed.

4. Replacement of AquaFighter

When more than 50% of the Aqua Fighter Canvas has turned red, replacement is recommended. Used AquaFighter Canvas must be safely placed in the bag it was delivered in or similar and delivered at an approved collection point, e.g. the local recycling center. Used AquaFighter Canvas will consist mostly of water, but small amounts of diesel can remain, and it should therefore be treated in the same way as waste lubricating, or hydraulic oil, fuel and paint residues and may be a special, universal or hazardous waste and should be disposed in accordance with all applicable state, federal and local laws in the area of use.

- When using AquaFighter Canvas for the first time, it is likely that there will be some free water in the tank and water dissolved in the diesel that will be removed and consequently it is not unlikely that the AquaFighter Canvas will reach its maximum limit of 50% red color already after a short time in the tank. DieselCare therefore recommends an inspection of the AquaFighter Canvas after maximum of one week the first time it's being introduced into a diesel storage tank. If AquaFighter Canvas needs to be replaced after a week, add a new AquaFighter Canvas in the tank and perform a new inspection within a week. Eventually, it should take longer and longer time between each time it is necessary to replace the AquaFighter Canvas with a new one. This simply means that the diesel in your tank has reached a level where water is no longer at harmful levels and the basis for microbe to grow is removed content and you get minimal problems related to diesel quality.

AquaFighter DipStick

This instruction manual applies to AquaFighter DipStick suitable for diesel tanks up to approx. 1000 liters (1 m³) / 250 US Gallons. To achieve the maximum performance of your AquaFighter DipStick, it is important that the following instructions are followed closely.

Please note that this user manual is applicable to AquaFighter DipStick used in stationary tanks. **Also note that the AquaFighter product should not be used in gasoline tanks.**

About AquaFighter DipStick

In today's highly efficient diesel engines, fuel injection systems often operate at 2,000 bar (30,000 psi) or even higher. In such extreme conditions water is your #1 enemy. AquaFighter is there to protect your high value diesel powered equipment.

In the past, water finding pasta was used to detect water in diesel tanks. However, as biodiesel has been introduced in almost all diesel qualities, this has rendered pasta an unreliable method for water detection. In addition, biodiesel is significantly more hydroscopic than fossil diesel increasing the probability of water related fuel challenges compared to previous years.

AquaFighter DipStick is a unique product intended to provide the user with a reliable indication on whether the diesel fuel tank has excessively high levels of water in it. In addition, Aqua Fighter DipStick has a certain capacity to remove water from the fuel. AquaFighter DipStick removes not only water in a free phase but also water that is either finely dispersed or even dissolved in the fuel. When using AquaFighter products, it will be possible to reduce the water content of diesel down to an acceptable level, i.e. water content below 200 mg/kg (200 ppm by mass) according to the European diesel specification EN590 (the maximum water and sediment content in ASTM D975 is 0.05 percent volume equal to 500 ppm by volume)

It should however be noted, that water is absorbed faster in warm conditions and significantly slower when the climate is cold. Hence, longer working time should be allowed during cold periods and winter.

Diesel that is not clear and bright at room temperature will in most cases have a water content exceeding the limits stated in the standards and hence also the engine manufacturers' requirements. Traditionally, "cloudy" diesel has been delivered as special waste, but with AquaFighter products it is now possible to remove the excess water and bring the contaminated diesel back on spec.

Another important factor is that microbes rely on water to live and multiply. By removing unacceptable amounts of water in the diesel, the "basis of life" for the microbes will be removed. Consequently, the risk of microbial blooms in diesel storage tanks where AquaFighter is used is minimized. Avoiding microbes significantly reduces the risk of diesel filter clogging - without the use of hazardous biocides.

Procedure for use on storage tanks

1. Read the entire procedure before opening the airtight bag containing the filter holder with filter and/or the replacement filters.

2. Carefully remove Aqua Fighter DipStick filter holder or replacement filter from the airtight bag. The DipStick filter holder is pre-loaded with a filter and is ready to use and if a replacement filter is to be inserted, remove the used filter and place the new filter in the DipStick filter holder. Lower AquaFighter DipStick into the tank.

*IMPORTANT; take care of the bag as this shall be used to contain the used AquaFighter (see section 3 below). Ensure that enough cord is available outside the tank so that it can be attached, e.g. by making a loop around the filler pipe, manhole cover or other suitable places.

3. Inspection and replacement of AquaFighter

Inspection: AquaFighter must be inspected regularly, e.g. monthly for water content/ water absorption. When handling AquaFighter and there is a risk of diesel exposure, gloves and other adequate protective equipment should be used to avoid contact with skin or eyes. If less than 50% of the AquaFighter filter has turned red, AquaFighter can be returned to the tank. If more than 50% of the AquaFighter filter has turned red, replacement is recommended (see "Replacement" below). In case of diesel spills and/ or diesel get in contact with the skin or eyes, the procedures described in the diesel safety data sheet must be followed.

4. Replacement of AquaFighter

When more than 50% of the Aqua Fighter filter has turned red, replacement is recommended. Used AquaFighter filters must be safely placed in the bag it was delivered in or similar and delivered at an approved collection point, e.g. the local recycling center. Used AquaFighter will consist mostly of water, but small amounts of diesel can remain, and it should therefore be treated in the same way as waste lubricating, or hydraulic oil, fuel and paint residues and may be a special, universal or hazardous wastes and should be disposed in accordance with all applicable state, federal and local laws in the area of use.

When using AquaFighter for the first time, it is likely that there will be some free water in the tank and water dissolved in the diesel that will be removed and consequently it is not unlikely that the AquaFighter will reach its maximum limit of 50% red color already after a short time in the tank. DieselCare therefore recommends an inspection of the AquaFighter after maximum of one week the first time it's being introduced into a diesel storage tank. If AquaFighter needs to be replaced after a week, add a new AquaFighter filter in the filter holder, lower it into the tank and perform a new inspection within a week. Eventually, it should take longer and longer between each time it is necessary to use a new AquaFighter filter. This simply means that the diesel in your tank has reached a level where water is no longer at harmful levels and the basis for microbes to grow is removed.

AquaFighter Snake Filter

This instruction manual applies to AquaFighter Canvas suitable for above and underground diesel storage tanks from approx. 250 US Gallons up to approx. 3,000 US Gallons. To achieve the maximum performance of AquaFighter Canvas, it is important that the following instructions are followed closely.

Please note that this user manual is applicable to stationary tanks and not tanks on a vehicle or movable machine.

Also note that the AquaFighter product should not be used in gasoline tanks.

About Aqua Fighter Snake Filter

In today's highly efficient diesel engines, the fuel injection systems often operate at 2,000 bar (30,000 psi) or even higher. In such extreme conditions water is your enemy #1. AquaFighter is there to protect your high value diesel powered equipment.

AquaFighter is a unique product that removes not only the free water phase which can form in a diesel storage tank. AquaFighter also removes water that is in a free phase, finely dispersed or even dissolved in the fuel. When using Aqua Fighter, it may be possible to reduce the water content of diesel down to an acceptable level, i.e. water content below 200 mg/kg (200 ppm by mass) according to the European diesel specification EN590. The maximum water and sediment content according to ASTM D975 is 0.05 percent volume equal to 500 ppm by volume.

It should however be noted, that water is absorbed faster in warm conditions and significantly slower when the climate is cold. Hence, longer working time should be allowed during cold periods and winter.

Diesel that is not clear and bright at room temperature will in most cases have a too high water content according to the standards and hence the engine manufacturers' requirements. Traditionally, "cloudy" diesel has been delivered as out of spec, but with AquaFighter it is now possible to remove the excess water and bring the contaminated diesel back on spec.

Another important factor is that microbes rely on water to live and multiply. By removing unacceptable amounts of water in the diesel, the "basis of life" for the microbes will be removed. Consequently, the risk of microbial blooms in diesel storage tanks where AquaFighter is used is minimized. Avoiding microbes significantly reduces the risk of diesel filter clogging - without the use of hazardous biocides.

How to use AquaFighter Snake Filter

AquaFighter Snake Filter consists of a Canvas with a high-tech water-absorbing material that can absorb approximately 500 times its own weight with water. At one end of the AquaFighter Snake Filter, a solid cord in fuel-resistant synthetic fiber material is attached. Always make sure that the cord is not harmed or broken before use.

HIGH IMPORTANCE

The AquaFighter Snake Filter should never be lowered in a tank unless you are able to retrieve it using the cord attached.

Always hold the cord in one end when lowering the canvas into the tank

The cord is used to retrieve AquaFighter from the tank. It is therefore *VERY IMPORTANT* to ensure that the end of this cord is available. It is recommended to secure the cord by e.g. making a loop around the filler pipe or manhole cap. Hence, the cord should at all times be accessible from outside of the tank and allowed to run all the way down to the bottom of the tank where the AquaFighter Canvas should be allowed to rest to do its job.

Aqua Fighter Snake Filter can remain in the tank continuously but regular checks for water absorption (e.g. once a month) is highly recommended.

Procedure for use on storage tanks

1. Carefully remove Aqua Fighter Snake Filter from the airtight bag. Lower AquaFighter Snake Filter into the tank. **IMPORTANT**; take care of the bag as this shall be used to contain the used AquaFighter (see section 3 below).
2. Ensure that enough cord is available outside the tank so that it can be attached, e.g. by making a loop around the filler pipe, manhole cover or other suitable places.

3. Inspection and replacement of AquaFighter Snake Filter

• **Inspection:** AquaFighter Snake Filter must be inspected regularly, e.g. monthly for water content/ water absorption. When handling AquaFighter Snake Filter and there is a risk of diesel exposure, gloves and other adequate protective equipment should be used to avoid contact with skin or eyes. If less than 50% of the AquaFighter Snake Filter has turned red, it can be returned to the tank. If more than 50% of the AquaFighter Snake Filter has turned red, replacement is recommended (see "Replacement" below). In case of diesel spills and/ or diesel get in contact with the skin or eyes, the procedures described in the diesel safety data sheet must be followed.

4. Replacement of AquaFighter

• When more than 50% of the Aqua Fighter Snake Filter has turned red, replacement is recommended. Used AquaFighter Snake Filter must be safely placed in the bag it was delivered in or similar and delivered at an approved collection point, e.g. the local recycling center. Used AquaFighter Snake Filter will consist mostly of water, but small amounts of diesel can remain, and it should therefore be treated in the same way as waste lubricating, or hydraulic oil, fuel and paint residues and may be a special, universal or hazardous waste and should be disposed in accordance with all applicable state, federal and local laws in the area of use.

• When using AquaFighter Snake Filter for the first time, it is likely that there will be some free water in the tank and water dissolved in the diesel that will be removed and consequently it is not unlikely that the AquaFighter Snake Filter will reach its maximum limit of 50% red color already after a short time in the tank. DieselCare therefore recommends an inspection of the AquaFighter

Canvas after maximum of one week the first time it's being introduced into a diesel storage tank. If AquaFighter Snake Filter needs to be replaced after a week, add a new AquaFighter Snake Filter in the tank and perform a new inspection within a week. Eventually, it should take longer and longer time between each time it is necessary to replace the AquaFighter Snake Filter with a new one. This simply means that the diesel in your tank has reached a level where water is no longer at harmful levels and the basis for microbe to grow is removed

General information



-  - **Use gloves**
-  - **Warning fuel vapors**



Maintenance

Once a year visual inspection should be done.