



## VERDERFLEX NBRF FOOD GRADE HOSE

Additional instructions



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## **Verderflex NBRF Food Grade Hose**



The information in this document is essential for the safe operation, maintenance and storing of Verderflex<sup>®</sup> NBRF food grade hose. This document must be read and understood thoroughly prior to installation and commissioning of a Verderflex pump with NBRF food grade hose.

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# 1. About this document





Verderflex NBRF food grade hose, has been developed according to the latest technology and subject to continuous quality control. These operating instructions are intended to facilitate familiarization with the hose and its designated use. The relevant information will act as a guideline for you in storing, using and maintaining the hose; alternative courses of action are also described should you be unable, for any reason, to follow those procedures initially given. You are advised to follow these guidelines to achieve maximum efficiency. These operating instructions Do not take into account local regulations; the operator must ensure that such regulations are strictly observed by all, including the personnel called in for installation.

## 1.1 Target groups



Target groups	Duty
Operating company	<ul style="list-style-type: none"> <li>▶ Keep this manual available at the operation site of the equipment, also available for later reference.</li> <li>▶ Ensure that personnel read and follow the instructions in this manual and the other applicable documents, especially all safety instructions and warnings.</li> <li>▶ Observe any additional rules and regulations referring to the system.</li> </ul>
Qualified personnel, fitter	<ul style="list-style-type: none"> <li>▶ Read, observe and follow this manual and the other applicable documents, especially all safety instructions and warnings.</li> </ul>

Tab. 1 Target groups and their duties

## 1.2 Warnings and symbols

Warning	Risk Level	Consequences of disregard
	Immediate acute risk	Death, serious bodily harm
	Potential acute risk	Death, serious bodily harm
	Potential hazardous situation	Minor bodily harm
	Potential hazardous situation	Material damage

Tab. 2 Warnings and consequences of disregarding them

Symbol	Meaning
	Safety warning sign in accordance with DIN 4844 - W9 <ul style="list-style-type: none"> <li>▶ Take note of all information highlighted by the safety warning sign and follow the instructions to avoid injury or death.</li> </ul>
▶	Instruction
1., 2.,	Multiple-step instructions
√	Precondition
→	Cross-reference
	Information, recommendation

Tab. 3 Symbols and their meaning

## 2. Safety



The manufacturer does not accept any liability for damage resulting from disregard of this documentation.

### 2.1 Intended use

- ▶ Only use the hose to handle compatible fluids. If in doubt, perform a dip test to determine compatibility (→ 10.1 Dip test).
- ▶ Adhere to the operating limits.

#### Prevention of obvious misuse (examples)

- ▶ Note the operating limits of the hose with regard to temperature, pressure, inappropriate cleaning solution, flow rate and motor speed (→ Pump data sheet).
- ▶ Do not operate the hose while the inlet/outlet valve is closed.
- ▶ Do not use the pump / hose in the immediate vicinity of extreme hot or cold sources.

### 2.2 General safety instructions

- ▶ Observe the following regulations before carrying out any work.

#### 2.2.1 Product safety



These operating instructions contain fundamental information which must be complied with during installation, operation and maintenance. Therefore this operating manual must be read and understood both by the installing personnel and the responsible trained personnel / operators prior to installation and commissioning, and it must always be kept easily accessible within the operating premises of the machine.

- ▶ Not only must the general safety instructions laid down in this chapter on “Safety” be complied with, but also the safety instructions outlined under specific headings.  
Operate the pump only if the pumping unit and all associated systems are in good functional condition.
- ▶ Only use the pumping system as intended, fully aware of safety and risk factors involved, and in adherence to the instructions in this manual. Keep this manual and all other applicable documents complete, legible and accessible to personnel at all times.

- ▶ Refrain from any procedure or action that would pose a risk to personnel or third parties.
- ▶ In the event of any safety-relevant faults, shut down the pump immediately and have the malfunction corrected by qualified personnel.
- ▶ The installation of the pump, associated pipe work and electrical fittings must comply with the requirements of installation given in this manual and any local national or regional health and safety regulations.

#### 2.2.2 Obligation of the operating company

##### Safety-conscious operation

- ▶ Ensure that the following safety aspects are observed and monitored:
  - Adherence to intended use
  - Statutory or other safety and accident-prevention regulations
  - Safety regulations governing the handling of hazardous substances if applicable
  - Applicable standards and guidelines in the country where the pump is operated
- ▶ Make personal protective equipment available pertinent to operation of the pump; as required.

##### Qualified personnel

- ▶ Ensure that all personnel tasked with work on the pump have read and understood this manual and all other applicable documents, including the safety, maintenance and repair information, prior to use or installation of the pump.
- ▶ Organize responsibilities, areas of competence and the supervision of personnel.
- ▶ Have all work carried out by specialist technicians only.
- ▶ Ensure that trainee personnel are under the supervision of specialist technicians, at all times, when working on the pumping system.

## Warranty

**i** The warranty is voided if the customer fails to follow any and all instructions, warnings and cautions in this document. Verder has made every effort to illustrate and describe the product(s) in this document. Such illustrations and descriptions are, however, for the sole purpose of identification and Do not express or imply a warranty that the products are merchantable or fit for a particular purpose, or that the products will necessarily conform to the illustration or descriptions.

Obtain the manufacturer's approval prior to carrying out any modifications, repairs or alterations during the warranty period. Only use genuine parts or parts that have been approved by the manufacturer.

For further details regarding warranty, please refer terms and conditions.

### 2.2.3 Obligation of personnel

**i** It is imperative that the instructions contained in this manual are complied with by the operating personnel at all times.

## 2.3 Specific hazards

### 2.3.1 Hazardous pumped liquids

**i** Follow the statutory safety regulations when handling hazardous pumped liquids (e.g. hot, flammable, poisonous or potentially harmful).

Use appropriate personal protective equipment when carrying out any work on the pump.

### 2.3.2 Medium pumped

**i** Ensure that the pumped liquid is compatible with the hose material.

## 3. Layout and function

The VERDERFLEX NBRF hose has an FDA compliant Food grade inner liner for use in EHEDG compliant or similar hygienic applications. The medium to be pumped does not come into contact with any moving part of the pump and is totally contained within the robust, heavy-duty hose, which consists of an inner layer, two to six reinforcement layers and an outer layer. A rotor passes along the length of the hose, compressing it. This motion forces the contents of the hose directly in front of the rotor to move forward along the length of the hose in a 'positive displacement', peristaltic movement. In the wake of the rotor's compressing action, the natural elasticity of the polymer reinforced rubber forces the hose to open and regain its round profile, creating suction pressure, which recharges the pump.

## 3.1 Design details

**i** Design and construction of the hose has critical implication for the effective operation, life expectancy and reliability during operation.

Verderflex hoses are made up of 3 key elements:

#### ► Inner liner :

All VERDERFLEX NBRF Food Grade hoses consist of a smooth black inner food grade liner bonded to a non-food grade outer. The inner liner is a taste-free and odour-less.

#### ► Fiber reinforcements:

- High strength synthetic cord
- Fiber reinforcements extend fatigue life of hose and allows it to self prime
- Verderflex hose will always have minimum 2 layers of fiber reinforcements. Hose diameters of 40 mm and above will have minimum 4 layers of fiber reinforcements

#### ► Outer cover:

- Designed to withstand wear from the rotor shoe
- Verderflex hoses do not require machining down and are manufactured by wrap finishing for close tolerances

## 3.2 Sectional View of Hose

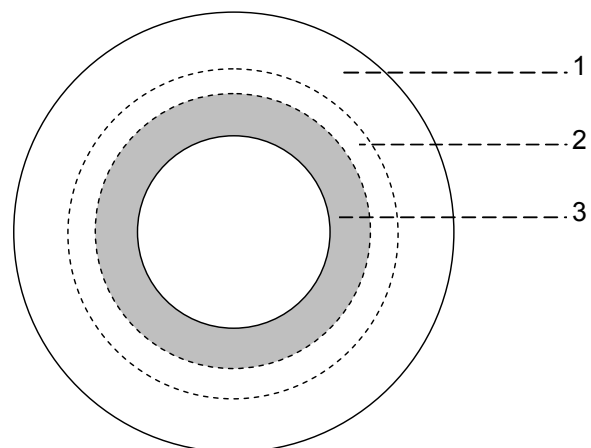


Figure 1. Cross sectional View

- 1 Outer layer
- 2 Nylon re-inforcement layer
- 3 Inner NBRF Food grade layer


## 4. Hose Identification

- ▶ VERDERFLEX NBRF Food Grade hoses can be identified by:
  - a) An external Yellow Coding / Identification tape and an additional white longitudinal stripe
  - b) Hoses can be identified by a batch specific , traceable number that is printed on the hose.

## 5. EHEDG approval

- ▶ VERDERFLEX NBRF food grade hoses can be used with suitably specified VERDERFLEX pumps to form an EHEDG accredited hygienic pumping system. To comply with this certification both the approved particle velocity must be maintained during the cleaning cycle and the appropriate hygienic port flanges fitted. Should a pump to this specification be required, it should be agreed with your local VERDERFLEX distributor before the pump is supplied.

## 6. Compliance and approvals

-  VERDERFLEX NBRF food grade hoses' inner liners are certified as compliant to FDA – CFR 21 Parts 170 to 199 – Item 177.2600, BfR XXI and and European Community (EC) Regulation n° 1935/2004 concerning materials and articles that are intended to come into contact directly or indirectly with food, has now become effective.

The Regulation EC n° 1935/2004 “aims to guarantee the efficient running of the internal market for what pertains to the admission into the EC market materials and articles intended to come into contact directly or indirectly with food, and also to build a base which ensures a high level of protection for human health and for consumers interests”.

## 7. Migration testing

- ▶ VERDERFLEX NBRF food grade hoses' inner liners have been migration tested for compliance with FDA – CFR 21 Parts 170 to 199 – Item 177.2600 and BfR XXI


## 8. Particle Release

- ▶ All hoses will release small quantities of rubber into the product stream, especially immediately after the hose installation and if the hose burst. Whilst the rubber released will be food grade particles, these may cause end-user concerns about contamination

and so we stress that it is the responsibility of the end user to ensure suitable particle capturing devices such as filters are fitted into the pump's discharge line.

VERDER LTD. DISCLAIMS LIABILITY FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES DUE TO PARTICLE RELEASED FROM THE HOSE

## 9. Limited Warranty

-  LIMITED WARRANTY INFORMATION – PLEASE READ CAREFULLY

The information contained herein is offered in good faith and is believed to be accurate. However, because conditions and methods of use of our products are beyond our control, this information should not be used in substitution for customer's tests to ensure that Verderflex products are safe, effective, and fully satisfactory for the intended end use. Suggestions of use shall not be taken as inducements to infringe any patent. Verderflex's sole warranty is that the product will meet the Verderflex sales specifications in effect at the time of shipment.

VERDER LTD. SPECIFICALLY DISCLAIMS ANY OTHER EXPRESS OR IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY.

VERDER LTD. DISCLAIMS LIABILITY FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.

## 10. Interim storage before installation


### NOTE

#### Material damage due to inappropriate storage!

- ▶ Make sure the storage room meets the following conditions:
  - Dry, humidity not to exceed 80%
  - Out of direct sunlight
  - Frost-free; temperature range 0 to 40°C
  - Vibration-free; minimize
  - Dust-free; minimize

Unused hoses should be stored as supplied in their wrapper and should be stored away from direct sunlight, flat and straight and at room temperature with end caps fitted.

## 11. Hose Installation

 All VERDERFLEX NBRF food grade hoses must be installed in accordance with the procedures defined in the VERDERFLEX Operating and maintenance manual. The hose must be used only with genuine Food Grade Verderlube or Food Grade Verdersil depending on medium compatibility and operating temperatures.

## 12. Pump Installation

▶ VERDERFLEX pumps using VERDERFLEX NBRF Food Grade hoses must be installed in accordance with recommendations made by the pump's supplier. In particular, special care must be given to the suction and discharge line conditions and that the hose is shimmed in accordance with VERDERFLEX's recommendations. Should there be any doubt about any installation details, these must be discussed with the pumps' supplier.

## 13. Storing pumps and hoses

▶ Verderflex pumps are designed for continuous use, however, there may be instances when pumps are withdrawn from use and stored for extended periods. We recommend certain pre-storage actions and precautions be taken whilst pumps and their components are not in use.

Similarly, hoses and lubricants may be held in stock to service working pumps and their recommended storage conditions are advised.


### 13.1 Pre-Storage Actions

- The hose should be removed from the pump and lubricant drained out from the pump casing.
- The pump casing should be washed out allowed to dry and any external build up of product removed.

### 13.2 Shelf Life

- When stored as supplied, in the wrapper, unused, stored away from direct sunlight and at room temperature with end caps fitted, the self life of a Verderflex NBRF hose is 18 months from the date of supply.

### 13.3 Cleaning Protocol for hoses


 VERDERFLEX NBRF food grade hoses must be cleaned with the following protocol –

- 1 First flush 0.5% Nitric Acid (HNO<sub>3</sub>) solution at up to 60°C
- 2 Second flush 4% Caustic soda (NaOH) solution up to 60°C
- 3 Eventually steamed open ends for 15 minutes at up to 110°C
- 4 Final flush: flush with clean water to remove all traces of cleaning solutions

**NOTE:** By increasing the number of cleaning cycles with chemicals, the life time will be reduced.

Under no circumstances should VERDERFLEX NBRF food grade hoses be cleaned with Sodium Hypochlorite (NaOCl) based cleaning solutions, neither should the above concentrations, exposure, durations or temperatures be exceeded.

## 14. Detecting hose failure

 A hose failure can be detected in a Verderflex pump by using a Verderflex VFOCS Overpressure Control and Hose Burst Detection System provide three basic functions:


1. It can be used to stop the pump in conjunction with suitable additional parts, to stop the pump when the hose bursts
2. The Hose Burst Detector is designed to prevent damage to the gearbox seals when the pump is run after a hose burst.
3. Over Pressure Warning in a "Sealed" Pump

The calibrated sensor detects an increase in the pressure inside a pump casing when a hose fails. As the pressure threshold is reached the sensor changes state and this is used in conjunction with an additional relay to turn-off the pump.

The detection system has a threshold of 0.4 Bar (5.6 P.S.I) and so, if fitted, the additional relay changes state when this is exceeded and may be used to initiate an alarm or stop the pump



## 15 Disposal

 With prolonged use, hose can get contaminated or fail, and would require replacement. During disposal the pump unit and associated parts should be disposed in accordance with statutory regulations.



### WARNING

#### Risk of environmental damage during disposal

- ▶ Prior to disposal of the pump:
  - Drain and dispose the lubricant in accordance with local regulations.
  - Collect and dispose of any leaking pumped liquid or oil in accordance with local regulations.
  - Neutralize residues of pumped liquid in the pump.
- ▶ Dispose of the pump unit and associated parts in accordance with statutory regulations.

## 16 Verderflex NBRF Food Grade Hose part numbers

Pump size	Part number
VF10	129.2021
VF15	129.2022
VF25	129.2023
VF32	129.2024
VF40	129.2025
VF50	129.2026
VF65	129.2027
VF80	129.2028
VF100	129.2029
D10	139.2021
D15	139.2022
D25	139.2023
D35	139.2024
D45	139.2025
D55	139.2026

Tab. 4 Verderflex NBRF Food Grade Hose part numbers

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**18 Declaration of conformity according to FDA – CFR 21 Parts 170 to 199 Item 177.2600, BfR XXI and and European Community (EC) Regulation n° 1935/2004**

<p><b>Declaration of conformity according to FDA – CFR 21 Parts 170 to 199 – Item 177.2600, BfR XXI and European Community (EC) Regulation n° 1935/2004</b></p> <p>We,                  VERDER Ltd., Unit 3 California Drive, Castleford                  hereby declare that the following machine adheres to the relevant directives detailed below</p> <p>Designation    <b>VERDERFLEX NBRF HOSE</b></p> <p>CONFORMANCE STANDARDS:</p> <ul style="list-style-type: none"> <li>• FDA – CFR 21 Parts 170 to 199 – Item 177.2600</li> <li>• BfR XXI</li> <li>• European Community (EC) Regulation n° 1935/2004</li> </ul>		
Responsible for the documentation	VERDER Ltd. Unit 3 California Drive Castleford WF10 5QH UK	
Date: 01/ 03/ 2015	Company stamp / signature:  <b>David Sampson</b> <i>Head of Development</i>	Company stamp / signature:  <b>David Hoyland</b> <i>Head of Quality</i>

Tab. 5 Declaration of conformity according to Declaration of conformity according to FDA – CFR 21 Parts 170 to 199 – Item 177.2600, BfR XXI and and European Community (EC) Regulation n° 1935/2004

