

# User manual – NucleoProtect® VET Swab Tubes

## 1 Components

### 1.1 Product content

REF	NucleoProtect® VET Swab Tubes
740760	Screw cap swab collection tubes pre-filled with 1.5 mL NucleoProtect® VET stabilization and inactivation reagent including individually peel-packed swabs with predetermined breaking point, box of 50 swab collection tubes and 50 swabs

It is strongly recommended to read the protocol details in this user manual when using **NucleoProtect® Swab Tubes** for the first time.

All technical literature is available online at [www.mn-net.com](http://www.mn-net.com).

### 1.2 Equipment to be supplied by the user

- Personal protection equipment (e.g., lab coat, gloves, goggles)

## 2 Product description

### 2.1 The basic principle

The NucleoProtect® VET Swab Tube is intended to collect swab samples from animals, inactivate viral pathogens and preserve viral nucleic acids (DNA and RNA) by denaturing nucleases. The ready-to-use system allows for the preservation and safe transport of veterinary swab samples from the sample collection site to the analyzing laboratory.

The NucleoProtect® VET Swab Tube allows the safe collection and transport of swab specimen from animals and subsequent viral nucleic acid (RNA/DNA) extraction for use in downstream analyses such as (RT)-PCR or q(RT)-PCR.

### 2.2 Product specification

The NucleoProtect® VET Swab Tube consists of a swab with a flocked tip and a collection tube with screw cap containing the NucleoProtect® VET stabilization and inactivation reagent. The swab can be used to collect samples from animals e.g. from mouth and nose. The tube contains 1.5 mL of the NucleoProtect® VET reagent that inactivates viruses and preserves the viral RNA and DNA during transport and storage. The product is not intended for human use.

### Inactivation of viruses

The inactivating of high risk viruses was tested in different background matrices, amongst those also saliva (see table below) using the Tissue Culture Infectious Dose (TCID) assay. Viruses were spiked into the different matrices with titers between 10exp6 and 10exp7 virus particles per ml and incubated for 30 minutes in the NucleoProtect® VET stabilization and inactivation reagent. Samples were diluted to prevent toxic effects of the NucleoProtect® VET reagent on cell culture cells and virus specific cell culture cells were infected with the treated viruses. Culture cells were subsequently incubated several days and analysed for cytopathic effects (CPE). An aliquot of each cell culture supernatant was then passaged to a fresh cell culture. In case of a lack of viral growth in both cell culture infection assays the viruses were considered as completely inactivated. The titer reduction was calculated from the starting titer and the dilution factor.

The level of virus titer reduction is shown in the table below (data kindly provided by the Friedrich-Loeffler-Institut, Federal Research Institute for Animal Health of Germany).

Virus	Background Matrix	Reduction of virus titer
Foot-and-mouth disease virus (FMDV)	Bovine tongue epithelium Whole blood Raw milk Saliva	> 10 <sup>4</sup> (corresponds to an inactivation capacity of > 99,99 %)
Bluetongue virus (BTV-5)		
Peste des petits ruminants virus (PPRV)		
Lumpy skin disease virus (LSDV)		
Bovine Coronavirus (BCoV)	Saliva	

The inactivation capacity of the NucleoProtect VET reagent has been demonstrated for various background matrices and viruses known to have different envelope structures as well as susceptibilities to disinfectants: FMDV (small non-enveloped virus), BTV-5 (large non-enveloped virus), LSDV (large enveloped virus), PPRV and BCoV (enveloped virus). Claims for inactivation of other viruses or background matrices cannot be made. Samples must be incubated for at least 30 min for complete inactivation.

### Sample stability

The stabilization capabilities of the NucleoProtect® VET reagent was tested with all naturally occurring viral genome structures: ss (+/-)RNA, dsRNA and dsDNA. In particular, the following viruses were tested:

Virus	Genome structure
Foot-and-mouth disease virus (FMDV) Porcine enterovirus (PEV) Bovine viral diarrhea virus (BVDV)	ss(+)RNA
Peste des petits ruminants virus (PPRV) Canine distemper virus (CDV)	ss(-)RNA
Bluetongue virus (BTV serotypes 5 and 8)	dsRNA
Lumpy skin disease virus (LSDV) Vaccinia virus (VV) Bovine herpes Virus (BoHV)	dsDNA

Stabilization of viral RNA and DNA was tested with spiked swab samples using virus specific q(RT)-PCR assays. NucleoProtect® VET-stabilized samples (swabs/blood) can be stored and shipped at the following conditions without sensitivity loss\*:

Storage condition	Storage time*
15 – 25 °C	7 days
4 °C	7 days
37 °C	2 days
-20 °C	30 days

\* the specified storage time indicates how long the samples can be stored at the specified condition with a loss of sensitivity of < 1Cq on average, as demonstrated in q(RT)-PCR analyses comparing stored samples to the time point of collection.

The NucleoProtect® VET Swab Tube is not intended for preserving morphology or viability of microorganisms. Due to its lytic activity, the NucleoProtect® VET reagent is not suited for serological testing.

### 2.3 Product handling

Wear gloves and goggles when handling NucleoProtect® VET Swab Tubes.

The NucleoProtect® VET Swab Tube is ready for use. No further preparation is necessary before use.

The NucleoProtect® VET stabilization and inactivation reagent appears colorless and clear. Do not use NucleoProtect® VET Swab Tubes if the reagent is discolored or contains precipitates. Do not use if foreign matter is observed within the swab collection tube.

The NucleoProtect® VET Swab Tube is intended for professional use only.

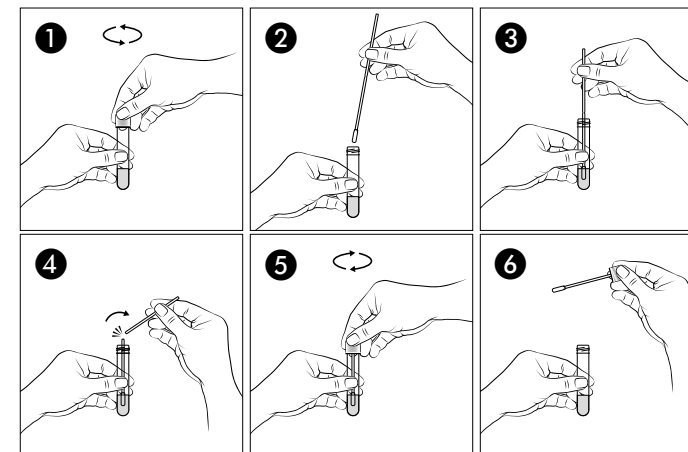
Do not use if the product or packaging are damaged or if there is evidence of leakage.

Insert Swab into the swab collection tube after collecting the veterinary sample. Do not insert the swab into the NucleoProtect® VET reagent before collecting the sample!

The NucleoProtect® VET reagent contains chemical additives. Prevent contact with the animal. The NucleoProtect® VET Swab Tube is intended for professional use only. Follow veterinarian and laboratory's standard procedures for collecting samples from animals and apply appropriate safety procedures.

### Specimen collection procedure

- Remove swab\* from packaging and collect sample according to standard clinical procedures (nasopharyngeal swab, nasal washes, oral/throat swabs, surface swabs).
- Unscrew the cap of the NucleoProtect® VET Swab Tube (1).
- Place swab containing the collected sample directly into the swab collection tube containing the NucleoProtect® VET stabilization and inactivation reagent (2/3).
- Carefully break the swab at the predetermined breaking point by bending it over the rim of the collection tube and discard the excess swab handle. The swab remains within the NucleoProtect® Swab Tube (4).
- Tighten the self-centering cap of the swab collection tube and prepare sample for shipment. Close tightly (5).
- Incubate sample in NucleoProtect® VET stabilization solution at least for 30 min before sample processing. The integrated swab holder, designed to facilitate the capture of the swab handle, allows easy removal of the swab from the specimen prior to further processing (6).



\*If swabs other than the enclosed swab are used, make sure that the swab has a predetermined breaking point at 80 mm from the tip and fits into the intake receptacle in the tube's crew cap. Make also sure that the swab tip is submerged in the NucleoProtect® VET reagent and that the swab material is compatible with the preservative.

## 3 Storage conditions

Store NucleoProtect® VET Swab Tubes at ambient temperature (15–25 °C). The product can be used until the expiry date printed on the label.

## 4 Safety instructions

Always wear suitable protective clothing (e.g., protective clothes, gloves, and goggles) when working with the NucleoProtect® VET reagent or when working with potentially infectious biological material.

Follow veterinary and laboratory standard procedures for collecting swab specimen from animals.

For more information consult the appropriate Material Safety Data Sheets (MSDS available online at [www.mn-net.com/msds](http://www.mn-net.com/msds)).



Caution: Avoid mixing the NucleoProtect® VET reagent with sodium hypochlorite (bleach) or other strong acids and bases. The mixtures could form highly reactive compound when combined with bleach!

The NucleoProtect® VET reagent contains chemical additives. Prevent contact with the animal.

Remove spilled NucleoProtect® VET reagent with an excess of water.

## 5 Nucleic acid extraction

The NucleoProtect® VET Swab Tube is compatible with the MACHERY-NAGEL NucleoSpin® VET kit (silica membrane single spin kit; REF 740842.10 / .50 / .250) and the NucleoMag® VET kit (magnetic bead based kit; REF 744200.1/.4) nucleic acid extraction systems.

The NucleoProtect® VET Swab Tube is also compatible with other common commercial nucleic acid extraction solutions. The user is responsible for validating additional nucleic acid extraction and purification methodologies.

### Nucleic acid extraction using the NucleoMag® VET\* kit (see ordering information below):

For detailed description of the nucleic acid extraction procedure from NucleoProtect® VET-stabilized samples using the NucleoMag® VET kit, please refer to the user manual.

Download user manual NucleoMag® VET\*:



[www.mn-net.com/NucleoMagVETmanual](http://www.mn-net.com/NucleoMagVETmanual)

Carefully read the user manual of the NucleoMag® VET kit before starting the nucleic acid extraction procedure.

Non-stabilized and NucleoProtect® VET-stabilized samples can be processed in parallel. For detailed description, please refer to the user manual.

**\*The NucleoMag® VET extraction kit has been automated on a wide variety of open liquid-handling or magnetic-rod platforms. Please contact MACHERY-NAGEL for technical automation support and verified methodologies: support@mn-net.com | +49 24 21 969-333**

### Nucleic acid extraction using the NucleoSpin® VET kit (see ordering information below):

For detailed description of the nucleic acid extraction procedure from NucleoProtect® VET-stabilized samples using the NucleoSpin® VET kit, please refer to the user manual.

Download user manual NucleoSpin® VET:



[www.mn-net.com/NucleoSpinVETmanual](http://www.mn-net.com/NucleoSpinVETmanual)

Carefully read the user manual of the NucleoSpin® VET kit before starting the nucleic acid extraction procedure.

For the processing of NucleoProtect® VET-stabilized samples using the NucleoSpin® VET kit, additional buffer PFN is needed (REF 740121.5, see ordering information).

Non-stabilized and NucleoProtect® VET-stabilized samples can be processed in parallel. For detailed description, please refer to the user manual.

## 6 Disposal

Always dispose hazardous, infectious or biologically contaminated materials in a safe and acceptable manner and in accordance with all local and regulatory requirements.

## 7 Contact information

For more detailed product use restriction / warranty please visit: [www.mn-net.com](http://www.mn-net.com)

Please contact our technical support for any product related inquiries:

MACHERY-NAGEL Germany  
Tel.: +49 24 21 969-333  
e-mail: support@mn-net.com

## 8 Ordering information

Product	Description	Pack of	REF
NucleoProtect® VET Swab Tubes	Screw cap swab collection tube prefilled with 1.5 mL NucleoProtect® VET stabilization and inactivation reagent including swabs	50	740760
Secondary caps for NucleoProtect® VET Swab Tubes	Sealing caps for NucleoProtect® Swab tubes	100	740761
<b>Accessory / related products</b>			
NucleoProtect® VET Blood Tubes	Blood collection tube prefilled with 4.0 mL NucleoProtect® VET stabilization and inactivation reagent	50	740755
Secondary caps for NucleoProtect® VET Blood Tubes	Sealing caps for NucleoProtect® VET Blood Tubes	100	740756
NucleoProtect® VET stabilization and inactivation reagent	NucleoProtect® VET stabilization and inactivation reagent for filling into own transport or storage vessels	50 / 500 mL	740750.50 / .500
NucleoMag® VET	Magnetic bead based kit for extraction of RNA and DNA from veterinary samples, containing NucleoMag® B-Beads, buffers, Carrier RNA, Proteinase K	1 × 96 / 4 × 96 / 100 × 96	744200.1/.4 / .100
Buffer VIA	Needed for the nucleic acid extraction from NucleoProtect® VET collected blood samples using the NucleoMag® VET kit	150 mL	744206
NucleoSpin® VET	Single spin kit for extraction of RNA and DNA from veterinary samples containing binding columns, collection Tubes (2 mL), collection tubes for lysis and elution (1.5 mL), buffers, liquid Proteinase K, Carrier RNA (lyophilized)	10 / 50 / 250	740842.10 / .50 / .250
Buffer PFN	Needed for the nucleic acid extraction from NucleoProtect® VET collected samples using the NucleoSpin® VET kit	5 mL	740121.5

Visit [www.mn-net.com](http://www.mn-net.com) for more detailed product information or contact our technical support (support@mn-net.com)

## 9 Product use restriction / warranty

All MACHERY-NAGEL products are designed for their intended use only. They are not intended to be used for any other purpose. The description of the intended use of the products can be found in the original MACHERY-NAGEL product leaflets. Before using our products, please observe the instructions for use and the safety instructions from the respective Material Safety Data Sheet of the product.

This MACHERY-NAGEL product is carrying documentation stating specifications and other technical information. MACHERY-NAGEL warrants to meet the stated specifications. The provided warranty is limited to the data specifications and descriptions as given in the original MACHERY-NAGEL literature. No other statements or representations, written or oral, by MACHERY-NAGELS employees, agents or representatives, except written statements signed by a duly authorized officer of MACHERY-NAGEL are authorized. They should not be relied upon by the customer and are not a part of a contract of sale or of this warranty.

Liability for all possible damages that occur in any connection with our products is limited to the utmost minimum as stated in the general business terms and conditions of MACHERY-NAGEL in their latest edition which can be taken from the company's website. MACHERY-NAGEL does not assume any further warranty.

Products and their application are subject to change. Therefore, please contact our Technical Service Team for the latest information on MACHERY-NAGEL products. You may also contact your

local distributor for general scientific information. Descriptions in MACHERY-NAGEL literature are provided for informational purposes only.

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