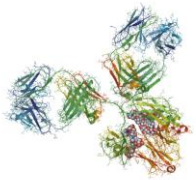

Ludger

Product Guide for LudgerTag™ V-tag Glycopeptide Labeling and Enrichment Kit

(Ludger Product Code: LT-VTAG-24)

Ludger Document # LT-VTAG-24-Guide-v2.0

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Specifications for LT-VTAG-24

Application For the fluorophore labeling and enrichment of glycopeptides.

Description This kit contains the reagents needed for the conjugation of V-tag dye (**LT- VTAG-01)** to the amine moieties of glycopeptides, and the specialised solid phase extraction (SPE) cartridges required for the purification and enrichment of the labeled glycopeptides.

Dye Properties Mass = 434.42 (resulting in a glycopeptide mass increase of 319.33 Da.)
Fluorescence, λ_{ex} = 250 nm, λ_{em} = 360 nm.

Number of Samples 24 separate analytical samples per kit.

Amount of Sample From approximately 1 µg to 50 µg of glycoprotein per sample.

Suitable Samples IgG single subclass glycoproteins. Other glycoproteins can be used, but note that if there are multiple glycosylation sites, the glycopeptides may need to be separated by C_{18} HPLC before HILIC analysis. It is recommended that samples do not have amine containing solvents (e.g. Tris type buffers) or reduction/alkylation agents as they will interfere with the V-tag labeling. Removal of the amine containing solvents and reduction/alkylation agents can be accomplished using devices which are designed for desalting and buffer exchange, as well as removal of low-molecular weight compounds.

Labeling Selectivity One V-tag label for every IgG glycopeptide N-terminus.

Storage: Store the V-tag dye at -20°C in the dark. Protect from sources of heat, light and moisture. Once used, extra dye solution can be frozen and re-used.

Shipping: The product can be shipped at ambient temperature.

Handling: Ensure that any glass, plastic-ware or solvents are free from unwanted peptidases, glycosidases and environmental carbohydrates. Use powder-free gloves for all sample handling procedures and avoid contamination with environmental carbohydrates.

Safety: **For research use only. Not for human or drug use**
Please read the Safety Data Sheets (SDS's) for all chemicals used. All processes involving labeling reagents should be performed using appropriate personal safety protection – safety glasses, chemically resistant gloves (e.g. nitrile), lab coat, and when appropriate, in a laboratory fume cupboard.

Kit Contents

Each labeling kit consists of each of the following:

Cat. #	Item	Quantity
LT-VTAG-01	Velocity Ludger Tag dye	0.53 mg in 150 µL DMSO
LC-TFA-10PC-01	TFA 10%	5 mL
LC-A-24	LudgerClean™-A cartridges	1 pack (24 cartridges)
LT-PBS-TAB-0.01M	pH 7.2 PBS Buffer tablet	1 tablet to make 1L

Additional Reagents and Equipment Required

- Heating block, oven, or similar dry heater set at 37°C for labeling reaction
- Reaction vials (e.g. polypropylene micro-centrifuge vials)
- Collection vials (e.g. polypropylene micro-centrifuge vials) or 96-deep well plate
- Pipettes (1 to 10 µL, 10 to 100 µl, 20 to 200 µl capacity and 100 to 1000 µl capacity)
- Vortex and centrifuge
- Acetonitrile (LC/MS grade)
- 18.2 MΩ·cm Water
- 96-well plate extraction vacuum manifold and vacuum pump (*optional*)

Time Line for Labeling

The LudgerTag™ V-tag labeling and enrichment of glycopeptides method takes approximately 2.5 hours:

Procedure	Time
Preparation samples	5 min
Addition of dye to samples	5 min
Incubate samples	1 hour
Clean up	1 hour

Outline of Protocol

The LudgerTag™ V-tag labeling kit is designed for the fluorophore labeling of enzymatically digested peptides and glycopeptides followed by enrichment of the labeled glycopeptides. Labeled glycopeptides can be separated using the same HILIC mode HPLC or UHPLC chromatography that is used for N-glycans: LudgerSep N2 HILIC column (LS-N2-2.0X150) for HPLC or columns such as the Waters BEH Glycan 2mm x 150 mm for UHPLC. See later in the guide for HPLC/UHPLC separation details.
The outline labeling and enrichment procedure is as follows:

Prelabeling - Enzyme digestion of the glycoprotein

Digest the protein with a protease enzyme of choice (Promega Trypsin Gold (Product # V5280) or equivalent is recommended) to produce the peptides and glycopeptides.

I Add V-tag dye to digested glycoprotein

Add the labeling solution to each sample.

II Incubate

Incubate the samples to allow the labeling reaction to progress.

III Post-labeling clean up and enrichment

After labelling, the removal of excess V-tag dye and enrichment of the glycopeptides is performed in a single step with the LC-A cartridges supplied.

IV Store or analyse the labeled glycopeptides

The labeled glycopeptides are now ready for analysis or can be stored in a freezer until required.

Notes on Enzymatic Digestion and Sample Preparation

Notes on the enzymatic digestion of the glycoprotein

The V-tag kit is designed to follow the enzymatic digestion of a glycoprotein. Many laboratories will already have a well-defined pronase or trypsin digest procedure, and the V-tag protocol will fit into this workflow provided the following:

- Ensure that prior to enzymatic digestion the sample is free from other contaminating protein or glycoproteins using method such as Protein A/G affinity chromatography (not supplied in this kit).

- The V-tag labeling is carried out in a phosphate buffered saline solution (0.01M sodium phosphate, 0.15M NaCl, pH = 7.2, PBS Tablet supplied in kit). If the enzymatic digestion is performed in a different solvent or the sample contains reagents from reduction/alkylation, the sample should be cleaned-up prior to the labeling reaction. Free amines, such as ethanolamine or Tris-amine containing buffers, will compete with the N-terminal glycopeptide labeling and quench the V-tag dye. Buffer exchange into PBS and small molecule removal can be accomplished using; centrifugal devices (e.g. Sartorius Vivaspins), solvent exchange SPE devices (e.g. GE Healthcare PD10 columns), or by dialysis using the appropriate molecular weight cut-off.

Step 1: Prepare the sample for the labeling reaction

- Dissolve the PBS tablet provided in the kit in 1.0 L of 18.2 MΩ·cm water
- The concentration of the glycopeptide sample should be approximately 1 mg/mL (based on starting protein concentration) in PBS (ensure there are no interfering contaminants – review Notes in above section on enzymatic digestion). *Example: If you have digested 10 µg of glycoprotein in 10ul PBS buffer, the sample is ready for labeling directly after enzymatic digestion.*
- Transfer 10 µL of the 1 mg/mL solution of the glycopeptide in PBS to a reaction vial

Suitable reaction vials include small polypropylene micro-centrifuge tubes and tubes for PCR work.

Labeling Reaction

Step 2: Defrost the V-tag dye solution

- V-tag dye is supplied dissolved in DMSO. Gently defrost it at room temperature before use.
  Once the V-tag dye is used the spare solution can be re-frozen and re-used. As with many fluorescent dyes, care should be taken to minimise exposure to light as it will degrade the dye over time.

Step 3: Add V-tag dye to samples

- Add 5 µL of the V-tag dye directly to each enzyme digested sample. Vortex and briefly centrifuge the samples.

Step 4: Incubate

- Place the reaction vials in a heating block or dry oven set at 37°C and incubate for 1 hour.

Step 5: Centrifuge and cool

- After the incubation period, briefly centrifuge the micro-tubes and allow them to completely cool to room temperature.

LudgerClean™ A Post-Labeling Sample Clean-up and Enrichment

Post-labeling sample **clean-up and enrichment** (to remove excess dye, labeling by-products and peptides) is necessary for certain applications - e.g. subsequent analysis by HPLC. This clean-up/enrichment can be achieved using the **LudgerClean™ A** devices which are supplied in the kit (Cat # LC-A-24).

LudgerClean cartridges are designed for use with any standard 96 well micro-titre plate compatible with a vacuum manifold (E.g. Ludger-Velocity Vacuum Manifold System - LC-VAC-MANIFOLD-KIT) or a liquid handling robot. NOTE: The devices can be used without a vacuum manifold. In this case a pipette can be used to help push the sample through the cartridge by use of air displacement if gravity alone takes longer than 5 minutes. It is important to ensure that the contact times for the binding, washing and elution steps are consistent and gradual. Fast times may result in poor binding and selective elution. If a solution passing through a cartridge is slower than 5 minutes then use a higher vacuum pressure or pipette to speed up the process, allowing at least 1 minute solvent contact time with the cartridge.

Step 6: Prepare the washing solutions

- Prepare solutions 1, 2, and 3 using 10% TFA (provided in kit as LC-TFA-10PC-01), acetonitrile and water (18.2 MΩ·cm).

  NOTE FOR SOLUTIONS 2 and 3*: These solutions should be prepared by measuring the volumes of water, acetonitrile and TFA independently and accurately before combining together. The composition of these solutions is critical for good enrichment results.*

  Solution 1. **0.1 % TFA**. For preparation of 100 mL do the following:
  Add 1mL of the 10% TFA solution to 99 mL of water.

  Solution 2. **76 % acetonitrile (ACN)**, **0.1 % TFA**. For preparation of 200 mL do the following:
  Mix together: 152 mL ACN, 46 mL water and 2 mL of the 10% TFA solution.

  Solution 3. **40 % ACN**, **0.1 % TFA**. For preparation of 100 mL do the following:
  Mix together: 40 mL ACN, 59 mL water and 1 mL of the 10% TFA solution.

Once the washing solutions are prepared and used, the spare solution can be store in the fridge and re-used.

Instructions for use of the LC-A cartridges with a vacuum manifold

Step 7: Prepare the LC-A cartridges

- Place a LudgerClean™ A cartridge for each sample into the cartridge holder, and position onto a vacuum manifold.
  For a more in-depth description of how to set up the cartridges on the vacuum manifold see the Ludger-Velocity SPE vacuum manifold system Guide found on our website www.ludger.com
- Prime each LudgerClean™ A cartridge by adding the following solutions, applying a slow vacuum to drain and discarding the flow-through:

1st wash: Solution 1 (0.1% TFA in water)	-	1 mL
2nd wash: Solution 2 (76% acetonitrile, 0.1% TFA)	-	1 mL

Step 8: Prepare the glycopeptide samples and apply to the LC-A cartridge

- Pipette 150 µL of 100% acetonitrile into the fluorophore labeled sample (typically the volume of the fluorophore labeling mix + glycopeptide sample is 15-25 µL). Gently mix the sample by pipette action and immediately load each sample onto a primed cartridge. Wait 5 minutes and then apply a slow vacuum (taking approximately one minute) to drain the LC-A cartridge.
  Note: In order to avoid sample precipitation, the addition of acetonitrile should be performed just before applying the sample onto the cartridge.

Step 9: Wash the LC-A cartridges

- Wash the cartridges with 3 x 1 mL of 76% acetonitrile, 0.1% TFA solution and discard the flowthrough.

Step 10: Elute the labeled glycoprotiens

- Remove the cartridge holder, place a deep-well collection plate in the vacuum manifold and re-place the cartridge holder on top.
- Elute the labeled glycopeptides by adding 0.5 mL of a 0.1% TFA/40% acetonitrile solution to each cartridge and wait for 5 minutes. Apply a slow vacuum taking approximately one minute to completely elute the samples.

The samples are now ready for HPLC/UHPLC and MALDI analysis.
When a weaker than recommended antibody concentration is used, we recommend concentrating the sample using centrifugal evaporation or the equivalent.

Analysis of LudgerTag™ V-tag-Labeled Glycopeptides

LudgerTag™ V-tag labeled glycopeptides may be studied by HPLC/UHPLC and MALDI mass spectrometry.

U/HPLC analysis

LudgerTag™ V-tag labeled glycopeptide mixtures may be separated and analysed by a variety of U/HPLC (high pressure liquid chromatography) systems and columns. For the best resolution results we recommend the use of UHPLC separation. Detailed below are the suggested UHPLC conditions which were used for a V-tag labelled, trypsin digested IgG-1 antibody.

UHPLC sample preparation:

- 25 µL of LC-A eluted glycopeptides in 0.1% TFA/40% acetonitrile solution + 35 µL ACN.
- Sample injected: 25 µL
- Injection mode: partial loop, 50 µL loop, syringe solution 80% acetonitrile
- Eluent A: 50 mMol Ammonium Formate, pH = 4.4
- Eluent B: Acetonitrile.
- Temperature: 60 °C
- Detection: Fluorescence, λ_{ex} = 250 nm, λ_{em} = 360 nm

Time (min)	Flow Rate (mL/min)	%A	%B
Initial	0.56	25	75
24.8	0.56	42	58
25.8	0.56	60	40
25.9	0.56	25	75

Table 1: Chromatography 30 min gradient used for a BEH Glycan 2.1 x 150 mm column (Waters) on a Thermo U3000 UHPLC.

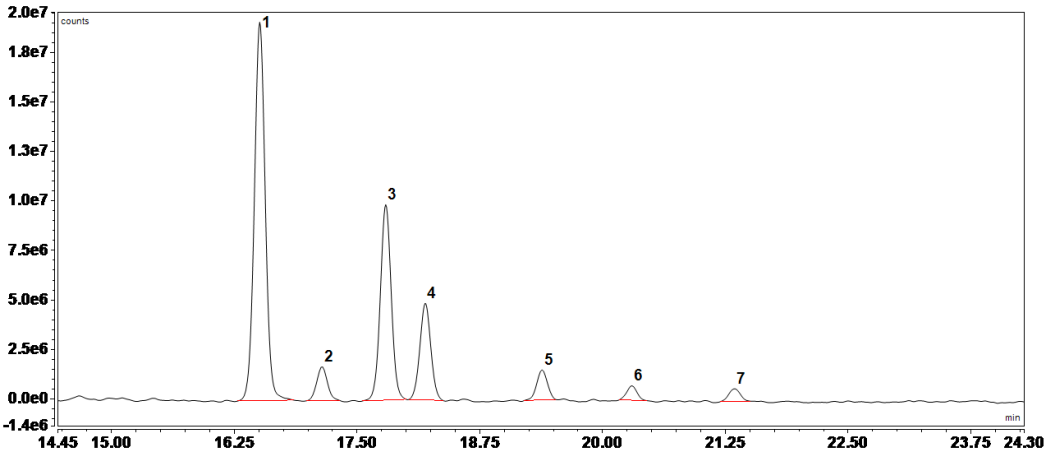

Figure 1: Chromatogram of a V-tag labeled, trypsin digested IgG-1 antibody performed on a Thermo U3000 UHPLC using a BEH Glycan 2.1 x 150 mm column (Waters) with a 30 min gradient.

Mass Spectrometry

LudgerTag™ V-tag labeled glycopeptides may also be analysed by mass spectrometry.

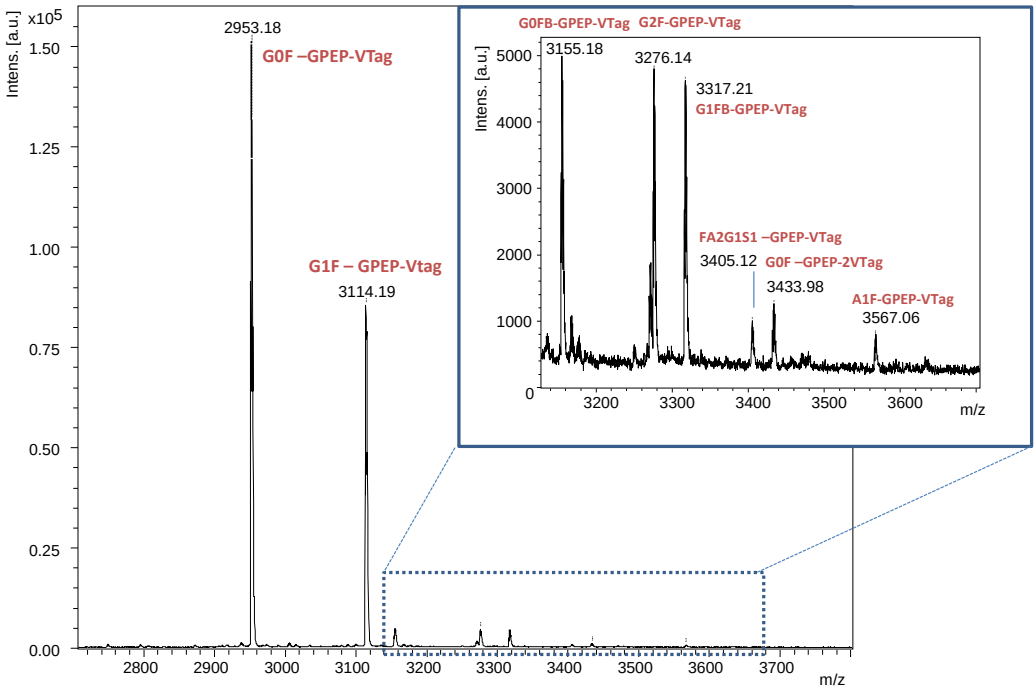

Figure 2: Negative ion mass spectrum of a V-tag labeled, trypsin digested IgG-1 antibody using a Bruker Autoflex MALDI instrument.

- Matrix: 2,5-dihydroxybenzoic acid (DHB)
- Mode: negative ion

Warranties and Liabilities

Ludger warrants that the above product conforms to the attached analytical documents. Should the product fail for reasons other than through misuse, Ludger will, at its option, replace free of charge or refund the purchase price. This warranty is exclusive and Ludger makes no other warrants, expressed or implied, including any implied conditions or warranties of merchantability or fitness for any particular purpose.
Ludger shall not be liable for any incidental, consequential or contingent damages.

This product is intended for *in vitro* research only.

Document Revision Number

Document # LT-VTAG-24-Guide-v2.0

Appendix 1: SDS

SAFETY DATA SHEET

Version: 1.0
Date written: 31th October 2013

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY / UNDERTAKING

Product Name **V-tag dye solution in DMSO**

Product Catalogue Name **LT-VTAG-01**

Company: Ludger Ltd
Culham Science Centre
Abingdon
Oxfordshire
OX14 3EB
Telephone: 01865 408554
Emergency Telephone: 01865 408554
Email: info@ludger.com

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture
Classification according to Regulation (EC) No. 1272/2008 [EU-GHS/CLP]
Serious eye damage/eye irritation (Category 2)

2.2 Label elements

Signal Word: Warning

Hazard Statement(s)

H320	Causes eye irritation.

Precautionary Statement(s)

P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313	If eye irritation persists: Get medical advice/attention.
P264	Wash hands thoroughly after handling

2.3 Other hazard information:
None

3. COMPOSITION/INFORMATION ON INGREDIENTS

3. 1 Substances

Synonyms: Velocity Ludger Tag
V-tag dye
Formula: $C_{19}H_{18}N_2O_8S$
Molecular Weight: 434.42 g/mol

Synonyms: DMSO
methyl sulfoxide
dimethyl sulfoxide
Formula: C_2H_6OS
Molecular Weight: 78.13g/mol

Component	**Concentration**
Name **V-tag dye**	3.5 mg/ml (<1 %)
CAS-No. -	-
EC-No. -	-
2nd Name **Dimethyl sulfoxide**	>99%
CAS-No. 67-68-5	
EC-No. 200-644-3	
Index-No.	

4. FIRST AID MEASURES

4.1 Description of first aid measures

General Advice
Consult a physician if exposure causes ill effects and if in any doubt. Show this safety data sheet to the physician/ first responder in attendance.

If Ingested
Get medical advice/attention if you feel unwell. Rinse mouth.

If skin is exposed
Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. If skin irritation or rash occurs: Get medical advice/attention.

If eyes are exposed
Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

If inhaled
Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical advice/attention if you feel unwell.

4.2 Most important symptoms and effects, both acute and delayed

Effects due to ingestion may include: Nausea, Fatigue and Headache

4.3 Indication of immediate medical attention and special treatment needed

No data available.

5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media
Dry chemical, foam, water spray, carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Take care as it may decompose upon combustion or in high temperatures to generate poisonous fume.

5.3 Advice for firefighters
When extinguishing fire, be sure to wear personal protective equipment.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Keep people away from and upwind of spill/leak. Entry to non-involved personnel should be controlled around the leakage area by roping off, etc.
Avoid breathing vapours, gas or mist. Remove all sources of ignition. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

6.2 Environmental Precautions
Prevent product from entering drains.

6.3 Methods and material for containment and cleaning up
Sweep dust to collect it into an airtight container, taking care not to disperse it. Adhered or collected material should be promptly disposed of, in accordance with appropriate laws and regulations.

6.4 Reference to other sections
No data available.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Technical measures: Handling is performed in a well ventilated place. Wear suitable protective equipment. Wash hands and face thoroughly after handling.
Advice on safe handling: Avoid contact with skin, eyes and clothing.

Avoid inhalation of vapour or mist. Keep away from sources of ignition- No smoking.
Take measures to prevent the build up of electrostatic charge.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed. Store in a cool and dark place.
Store away from incompatible materials such as oxidizing agents.

7.3 Specific end uses
No data available

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
Components with workplace control parameters.

8.2 Exposure controls

Appropriate engineering controls
Install a closed system or local exhaust as possible so that workers should not be exposed directly. Also install safety shower and eye bath.
Handle in accordance with good laboratory hygiene and safety practice. Wash hands before breaks and at the end of the day.

Personal Protective Equipment
Eye / face protection
Safety glasses. A face-shield, if the situation requires

Skin protection
Handle with gloves, which should be inspected before use. Use proper glove removal technique (removal without the outside of the glove touching the skin) to avoid contact with the skin/chemical. Dispose of contaminated gloves as Laboratory waste in accordance with applicable laws and good laboratory practices. Wash and dry hands.
Gloves should be of the standard that will stratify the specifications of EU directive 89/696/EEC and the standard EN 374 derived from it.

Body Protection
The type of protective clothing must be selected according to the amount of substance at the specific workplace being used. Impervious coats or laboratory coats.
.
Respiratory protection
Use substance in an operation fume hood/ outside venting extraction cupboard. Wear full face respirator if appropriate to use, must be tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	Form: Liquid, clear Colour: Colourless
Odour	No data available
Odour threshold	No data available
pH	No data available
Freezing/Melting Point	No data available
Initial boiling point and boiling range	No data available
Flash Point	No data available
Evaporation rate	No data available
Flammability	No data available
Upper/lower flammability or explosive limits	No data available
Vapour Pressure, Pa at temperature °C	No data available
Relative Density	No data available
Solubility in water and solvents (mg/l)	No data available
Partition coefficient	No data available

Autoignition temperature	No data available
Decomposition temperature	No data available
Viscosity	No data available
Explosive properties	No data available
Oxidising properties	No data available

9.2 Other information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No special reactivity has been reported.

10.2 Chemical stability
No data available

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to Avoid
Heat, flames and sparks

10.5 Incompatible materials
Oxidizing agents

10.6 Hazardous decomposition products
Carbon monoxide, Carbon dioxide, Nitrogen oxides (NOx), Sulphur oxides

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral – Rat – 14,500mg/kg
LC50 Inhalation – Rat – 4h – 40250ppm
LD50 Dermal – Rabbit - > 5,000mg/kg

Skin corrosion/irritation Skin – Rabbit – No skin irritation – 4h
Serious eye damage/irritation Eyes – Rabbit – 500 mg/24H MLD
Respiratory or skin sensitisation No data available
Germ cell mutagenicity
Genotoxicity in vitro – Mouse – lymphocyte
Cytogenetic analysis
Genotoxicity in vitro – Mouse – lymphocyte
Mutation in mammalian somatic cells
Genotoxicity in vivo – Rat – Intraperitoneal
Cytogenetic analysis
Genotoxicity in vivo - Mouse – Intraperitoneal
DNA damage

Carcinogenicity

Carcinogenicity – Rat – Oral
Tumorigenic: Equivocal tumorigenic agent by RTECS criteria. Skin and Appendages: Others: Tumors.
Carcinogenicity – Mouse – Oral
Tumorigic: Equivocal tumorigenic agent by RTECS criteria. Lukaemia skin and appendages: Other: Tumors.
IARC: No component of this product presents at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Reproductive toxicity

Reproductive toxicity – Rat – Intraperitoneal
Effects on fertility: Abortion
Reproductive toxicity – Rat – Intraperitoneal
Effects on fertility: Post – implantation mortality (e.g. dead and/or resorbed implants per total number of implants).
Reproductive toxicity – Rat – Subcutaneous
Effects on fertility: Post – implantation mortality (e.g. dead and/or resorbed implants per total number of implants). Effects on fertility: Litter size (e.g. # fetuses per litter; measured before birth).

Reproductive toxicity – Mouse – Oral
Effects on fertility: Pre-implantation mortality (e.g. reduction in number of implants per female; total number of implants per corpora lutea). Effects on Embryo or fetus: Fetoxicity (except death, e.g. stunted fetus). Specific developmental abnormalities: Musculoskeletal system.
Reproductive toxicity – Mouse – Intraperitoneal
Effects on embryo or fetus: Fetoxicity (except death, e.g. stunted fetus). Specific developmental abnormalities: Musculoskeletal system.

STOT-single exposure
No data available

STOT-repeated exposure
No data available

Aspiration hazard.
No data available

Potential Health Hazards

Inhalation May be harmful if inhaled. May cause respiratory tract irritation.
Ingestion May be harmful if swallowed.
Skin May be harmful if absorbed through skin. May cause skin irritation.
Eyes May cause eye irritation.

Aggravated Medical

Condition Avoid contact with DMSO solutions containing toxic materials or materials with unknown toxicological properties. Dimethyl sulfoxide is readily absorbed through the skin and may carry such materials into the body.

Signs and symptoms of exposure
Effects due to ingestion may include; Nausea, Fatigue, Headache.

Additional Information

RTECS: PV6210000

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to Fish LC50-Pimephales promelas (fathead minnow) – 34,000mg/l - 96h
LC50-Oncorhynchus mykiss (rainbow trout) – 34,000mg/l-96h
Toxicity to daphnia and other
Aquatic invertebrates EC50-Daphnia pulex (water fleas) – 27,500mg/l
Toxicity to algae EC50-Lepomis macrochirus (bluegill) - >400,000mg/l-96h

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4. Mobility in soil
No data available

12.5. Results of PBT and vPvB assessment
No data available

12.6. Other adverse effects
Water Hazard Classes (WGK): Class 1 - Slightly water polluting substance

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods
This combustible material may be burned in a chemical incinerator equipped with an afterburner and scrubber or to be disposed of by a licensed professional waste disposal company.

Contaminated packaging
Dispose of as the unused product.

14. TRANSPORT INFORMATION

14.1 UN Number
ADR/RID: - IMDG: - IATA: -

14.2 UN Proper Shipping Name
ADR/RID: Not Dangerous Goods
IMDG: Not Dangerous Goods
IATA: Not Dangerous Goods

14.3 Transport hazard class (es)
ADR/RID: - IMDG: - IATA: -

14.4 Packing group
ADR/RID: - IMDG: - IATA: -

14.5 Environmental hazards

ADR/RID: No IMDG Marine pollutant: No IATA: No

14.6 Special precautions for user
No data available

15. REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Data not available

15.2 Chemical Safety Assessment

Indication of danger:
No data available.

Please note that the label elements that used to go in Section 15 are now in Section 2.

16. OTHER INFORMATION

The advice offered is derived from the current available information on the hazardous materials in this product and it component(s). Consideration has been made regarding the quantities offered in the pre dispensed container. The advice offered is, therefore not all inclusive nor should it be taken as the descriptive of the compound generally.

SECTION 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY / UNDERTAKING

Product Name	**Trifluoroacetic acid, 10%, solution**
Product Catalogue Name	**LC-TFA-10PC-01**
Company:	Ludger Ltd Culham Science Centre Abingdon Oxfordshire OX14 3EB
Telephone:	01865 408554
Emergency Telephone:	01865 408554
Email:	info@ludger.com

SECTION 2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture
Classification according to Regulation (EC) No. 1272/2008 [EU-GHS/CLP]
Skin corrosion (Category 1A)
Chronic aquatic toxicity (Category 3)

2.2 Label elements

Signal Word: Danger

Hazard Statement(s)

H314	Causes severe skin burns and eye damage.
H412	Harmful to aquatic life with long lasting effects.

Precautionary Statement(s)

P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do so. Continue rinsing.
P310	Immediately call a POISON CENTER or doctor/ physician.

2.3 Other hazard information:
None available.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

3. 1 Substances
Synonyms: TFA

Formula: TFA: $C_2HO_2F_3$
Water: H_2OH_2O
Molecular weight: TFA: 114.02 g/mol
Water: 18.02 g/mol

Component		Classification	Concentration
Name	Trifluoroacetic acid	Skin Corr.1A; Aquqatic Chronic	10%
CAS-No.	76-05-1	3; Acute Tox. 4; H314, H332,	
EC-No.	200-929-3	H412	
Index-No	607-091-00-1		
2nd Name	Water	-	90%
CAS-No.	7732-18-5		
EC-No.	231-791-2		

For the full text of the H-Statements and R-Phrases mentioned in this Section please see Section 3 and 16.

SECTION 4. FIRST AID MEASURES

4.1 Description of first aid measures

General Advice
Consult a physician if exposure causes ill effects and if in any doubt. Show this safety data sheet to the physician/ first responder in attendance.

If Ingested
Do NOT induce vomiting. Rinse mouth well with water. Never give anything to a person if unconscious.

If skin is exposed
Remove contaminated clothing and shoes. Wash the affected area well with plenty of soap and water.

If eyes are exposed
Rinse thoroughly for at least 15 minutes with plenty of water/ eye wash solution. Remove contacts if safe to do so and continue rinsing.

If inhaled
Move affected person to a source of ventilation/ fresh air. If not breathing, give artificial respiration.

4.2 Most important symptoms and effects, both acute and delayed
The product can be destructive to tissue of the mucous membranes, upper respiratory tract, eyes and skin.

4.3 Indication of immediate medical attention and special treatment needed
No data available.

SECTION 5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media

Select extinguishing media appropriate to surrounding area, compatible extinguishing material for the product are Water spray, alcohol-resistant foam, dry chemical and carbon dioxide.

5.2 Special hazards arising from the substance or mixture

Carbon dioxides, Hydrogen fluoride.

5.3 Advice for firefighters

If necessary, wear self-contained breathing equipment.

SECTION 6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear PPE, Personal Protective Equipment, avoid breathing in vapours, mist or gas by ensuring adequate ventilation. Move any unnecessary staff away from the spill.

6.4 Environmental Precautions

Contain the spillage; prevent any product from entering the drainage system as discharge into the environment is to be avoided.

6.5 Methods and material for containment and cleaning up

Contain the spillage with a spill mat or inert material such as vermiculite. Carefully collect the contaminated material into a suitable container with a lid; arrange collection and disposal of the hazardous solid waste.

6.4 Reference to other sections

See Section 13 for more information on disposal.

SECTION 7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Wear PPE, Personal Protective Equipment, avoid breathing in vapours, mist or gas by ensuring adequate ventilation when handling the product.

7.2 Conditions for safe storage, including any incompatibilities

Store the product in a cool, dry, well ventilated place.

7.3 Specific end uses

No data available.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

This product contains no substances with occupational exposure limits values.

8.3 Exposure controls

Appropriate engineering controls

Handle the product using good laboratory and safety practice, wearing gloves, safety glasses and laboratory coat. Wash and dry hands before and after handling the product, even with wearing gloves.

Personal Protective Equipment

Eye / face protection

Wear laboratory glasses or safety goggles. Use equipment for eye protection tested and approved under appropriate standards such as NIOSH (US) or EN 166 (EU).

Skin protection

Handle with gloves, check gloves before using for any tares/ holes. Remove used gloves using the proper glove removal technique, so that the outer side of the glove does not touch the skin, to avoid

skin contact with the product. Dispose of used gloves as contaminated waste, see section 13 for information. Gloves must satisfy the specifications of the EU Directive 89/686/EEC and the standard EN 374 derived from it.

Body Protection
Wear laboratory coat or similar covering over outside clothing.

Respiratory protection
Handle the material under an extraction cabinet or fume hood, as part of the kit. If respirators are required they should be tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Thermal hazards
No data available.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	Form: Clear, liquid Colour: Colourless
Odour	Slight
Odour threshold	No data available
pH	No data available
Freezing/Melting Point	No data available
Initial boiling point and boiling range	No data available
Flash Point	No data available
Evaporation rate	No data available
Flammability	Not Flammable
Upper/lower flammability or explosive limits	No data available
Vapour Pressure	No data available
Relative Density	No data available
Solubility in water and solvents	Yes
Partition coefficient	No data available
Autoignition temperature	No data available
Decomposition temperature	No data available
Viscosity	No data available
Explosive properties	None
Oxidising properties	No data available

9.2 Other information
No data available

SECTION 10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
No data available

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to Avoid
No data available

10.5 Incompatible materials

Strong bases, Metals, Oxidizing agents, Alcohols, Epoxides, Steel (all types and surface treatments), Aluminium, Reacts violently with Alkali metals.

10.6 Hazardous decomposition products
Other decomposition products – No data available.

SECTION 11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available

Skin corrosion/irritation
No data available

Serious eye damage/irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
IARC: No components of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Reproductive toxicity
No data available

STOT-single exposure
No data available

STOT-repeated exposure
No data available

Aspiration hazard.
No data available

Potential Health Hazards

Inhalation	May be harmful if inhaled. Material can be destructive to the tissue of the mucous membranes and the upper respiratory tract.
Ingestion	May be harmful if swallowed. Causes burns.
Skin	May be harmful if absorbed through skin. Causes burns.
Eyes	Causes burns to the eyes.

Signs and symptoms of exposure
The product can be destructive to tissue of the mucous membranes, upper respiratory tract, eyes and skin.

SECTION 12. ECOLOGICAL INFORMATION

12.1 Toxicity

No data available.

12.2 Persistence and degradability
No data available.

12.3 Bioaccumulative potential
No data available.

12.4. Mobility in soil
No data available.

12.5. Results of PBT and vPvB assessment
No data available.

12.6. Other adverse effects
Harmful to aquatic life.

SECTION 13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods
Contact waste professional waste disposal company that is licensed to carry such waste material, liquid and solids, for the disposal of waste product. This product cannot go into the drainage systems.

Contaminated packaging
Dispose of as unused product.

SECTION 14. TRANSPORT INFORMATION

14.1 UN Number
ADR/RID: 2699 IMDG: 2699 IATA: 2699

14.2 UN Proper Shipping Name
ADR/RID: TRIFLUROROACETIC ACID, SOLUTION
IMDG: TRIFLUROROACETIC ACID, SOLUTION
IATA: Trifluoroacetic acid, SOLUTION

14.3 Transport hazard class(es)
ADR/RID: 8 IMDG: 8 IATA: 8

14.4 Packing group
ADR/RID: I IMDG: I IATA: I

14.5 Environmental hazards
ADR/RID: No IMDG Marine pollutant: No IATA: No

14.6 Special precautions for user
No data available.

SECTION 15. REGULATORY INFORMATION

This safety data sheet complies with the requirements of the Regulation (EC) No. 1907/2006.

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture
No data available.

15.2 Chemical Safety Assessment
No data available.

Please note that the label elements that used to go in Section 15 are now in Section 2.

SECTION 16. OTHER INFORMATION

The advice offered is derived from the current available information on the hazardous materials in this product and it component(s). Consideration has been made regarding the quantities offered in the pre dispensed container. The advice offered is, therefore not all inclusive nor should it be taken as the descriptive of the compound generally.

SECTION 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY / UNDERTAKING

Product Name **LudgerClean™ A cartridges**

Product Catalogue Name **LC-A-24**

Company: Ludger Ltd
Culham Science Centre
Abingdon
Oxfordshire
OX14 3EB
Telephone: 01865 408554
Emergency Telephone: 01865 408554
Email: info@ludger.com

SECTION 2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

This product is not classified as dangerous according to Regulation (EC) No. 1272/2008 [GHS/CLP].

2.2 Label elements

None required.
Signal Word: Caution – Substance not yet tested completely.

Hazard Statement(s)
No data available.

Precautionary Statement(s)
No data available.

2.3 Other hazard information:

No data available.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

3. 1 Substances

Synonyms: Synthetic amorphous silica gel
Formula: Information not available

Component		Concentration
Name	A cartridge resin	>95%
CAS-No.	None	
EC-No.	None	

SECTION 4. FIRST AID MEASURES

4.1 Description of first aid measures

General Advice
Consult a physician if exposure causes ill effects and if in any doubt. Show this safety data sheet to the physician/ first responder in attendance.

If Ingested
Rinse mouth with plenty of water if the person is conscious. Never give anything by mouth to an unconscious person. Drink plenty of fluids afterwards.

If skin is exposed
Wash effected area(s) with plenty of soap and water.

If eyes are exposed
Flush eyes with plenty of water/ eye wash, making sure that the eye is rinsed well, paying attention to the areas around the eyelids.

If inhaled
Move person into fresh air. If breathing has stopped give artificial respiration.

4.2 Most important symptoms and effects, both acute and delayed
No data available

4.3 Indication of immediate medical attention and special treatment needed
No data available

SECTION 5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media
Use a dry chemical, CO_2, water spray or alcohol foam media. Choose and extinguisher which is appropriate for the surrounding conditions.

5.2 Special hazards arising from the substance or mixture
No data available.

5.3 Advice for firefighters
For extreme fires, wear self-contained breathing apparatus for fire-fighting.

SECTION 6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Ventilate the effected area thoroughly and shut off any sources of ignition. Use PPE described in Section 8. Avoid causing dust when sweeping up the chemical. Avoid breathing in the dust.

6.6 Environmental Precautions
Do not let the chemical enter that drainage system.

6.7 Methods and material for containment and cleaning up
Collect the spilt chemical, creating as little dust as possible. Sweep up the chemical and shovel into a suitable container with and air tight lid. Arrange collection on the waste material.

6.4 Reference to other sections
Section 8 and 13.

SECTION 7. HANDLING AND STORAGE

7.1 Precautions for safe handling
To handle/ work with the product in a well-ventilated area and user to wear PPE.

7.2 Conditions for safe storage
Keep the products in a dry and well ventilated storage cupboard/cabinet, in original packaging or in a container with a lid. Keep product away from direct sunlight. Store at Room temperature.

7.3 Specific end uses
No data available.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
This product contains no substances with occupational exposure limit values.

8.4 Exposure controls

Appropriate engineering controls

General advice to the user is to wear PPE, and wash hands, avoid contact with skin. To follow good laboratory practice for safety and hygiene.

Personal Protective Equipment

Eye / face protection

Safety glasses with side shields conforming to EN 166. Use eye equipment for eye protection tested and approved under appropriated government standards such as NIOSH (US) or EN 166 (EU).

Skin protection

Wear gloves when handling the product. Gloves must conform to the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it. Inspect gloves before use for tears and holes, gloves to be removed using the proper removal technique (without touching the outer surface of the glove) to avoid skin contact with the product. To be disposed of as chemical waste.

Body Protection

Laboratory over cover such as a laboratory coat or any other similar coverings.

Respiratory protection

Product to be used under extraction or well-ventilated area, no further protection is required for the amount per cartridge.

Thermal hazards

No data available.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	Form: Powder Colour: White
Odour	None
Odour threshold	None
pH	No data available
Freezing/Melting Point	No data available
Initial boiling point and boiling range	No data available
Flash Point	No data available
Evaporation rate	No data available
Flammability	No data available
Upper/lower flammability or explosive limits	No data available
Vapour Pressure	No data available
Relative Density	No data available
Solubility in water	Insoluble
Partition coefficient	No data available
Autoignition temperature	No data available
Decomposition temperature	No data available
Viscosity	No data available
Explosive properties	No data available
Oxidising properties	No data available

9.2 Other information

No data available

SECTION 10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable when stored under the recommended storage conditions in Section 7.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to Avoid
Extreme temperatures, High or low.

10.5 Incompatible materials
Strong oxidising agents, strong acids and hydrogen fluoride.

10.6 Hazardous decomposition products
Formed under fire/ high temperatures – Silicon oxides.

SECTION 11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects
To the best of our knowledge, the toxicological properties of this product have not been fully investigated.

Acute toxicity
No data available

Skin corrosion/irritation
No data available

Serious eye damage/irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
No data available

Reproductive toxicity
No data available

STOT-single exposure
No data available

STOT-repeated exposure
No data available

Aspiration hazard.
No data available

Potential Health Hazards
This product has no known adverse effect on human health.

Inhalation	May cause respiratory tract irritation.
Ingestion	No data available
Skin	May cause skin irritation.

Eyes May cause eye irritation.

Signs and symptoms of exposure
No data available

SECTION 12. ECOLOGICAL INFORMATION

The eco-toxicological properties of this material have not been fully investigated.

12.1 Toxicity
No data available.

12.2 Persistence and degradability
No data available.

12.3 Bio-accumulative potential
Does not bio-accumulate.

12.4. Mobility in soil
No data available.

12.5. Results of PBT and vPvB assessment
No data available.

12.6. Other adverse effects
No data available.

SECTION 13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods
Contact a licensed professional waste disposal service to dispose of waste product. Do not send as general waste for disposal.

Contaminated packaging
Dispose of as unused product, follow the above advice.

SECTION 14. TRANSPORT INFORMATION

14.1 UN Number
ADR/RID: - IMDG: - IATA: -

14.2 UN Proper Shipping Name
ADR/RID: Not classed as dangerous goods
IMDG: Not classed as dangerous goods
IATA: Not classed as dangerous goods

14.3 Transport hazard class(es)
ADR/RID: - IMDG: - IATA: -

14.4 Packing group
ADR/RID: - IMDG: - IATA: -

14.5 Environmental hazards
ADR/RID: No IMDG Marine pollutant: No IATA: No

14.6 Special precautions for user
No data available.

SECTION 15. REGULATORY INFORMATION

This product is not classified as dangerous according to Regulation (EC) no. 1272/20088 (GHS/CLP) or Directive 1999/45/EC.

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

No data available.

15.2 Chemical Safety Assessment

No data available.

SECTION 16. OTHER INFORMATION

The advice offered is derived from the current available information on the hazardous materials in this product and it component(s). Consideration has been made regarding the quantities offered in the pre dispensed container. The advice offered is, therefore not all inclusive nor should it be taken as the descriptive of the compound generally.

SECTION 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY / UNDERTAKING

Product Name **Phosphate buffered saline tablet**

Product Catalogue Name **LT-PBS-TAB-0.01M**

Company: Ludger Ltd
Culham Science Centre
Abingdon
Oxfordshire
OX14 3EB
Telephone: 01865 408554
Emergency Telephone: 01865 408554
Email: info@ludger.com

SECTION 2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Not a hazardous substance or mixture.
Not a hazardous substance or mixture.

2.2 Label elements

The product does not need to be labelled in accordance with EC directives or respective national laws.

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

3. 1 Substances

Synonyms: PBS

Component		Concentration
Name	Phosphate buffered saline	99.0%; 0.01M Phosphate buffer, 0.0027M KCl, 0.14M NaCl
CAS-No.	None	
EC-No.	None	

SECTION 4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

Oxides of phosphorus, Hydrogen chloride gas, Potassium oxides, Sodium oxides

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

SECTION 6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Avoid breathing dust. For personal protection see section 8.

6.2 Environmental precautions
Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

SECTION 7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols.
Provide appropriate exhaust ventilation at places where dust is formed.

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Store in cool place. Keep container tightly closed in a dry and well-ventilated place.
Storage class (TRGS 510): Non Combustible Solids

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
Components with workplace control parameters
Contains no substances with occupational exposure limit values.

8.2 Exposure controls
Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment
Eye/face protection
Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Body Protection
impervious clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
For nuisance exposures use type P95 (US) or type P1 (EU EN 143) particle respirator.For higher level protection use type OV/AG/P99 (US) or type ABEK-P2 (EU EN 143) respirator cartridges. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Do not let product enter drains.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance Form	solid

Odour	No data available
Odour Threshold	No data available
pH	7.2 - 7.6 at 25 °C
Melting point/freezingpoint	No data available
Initial boiling point andboiling range	No data available
Flash point	Not applicable
Evaporation rate	No data available
Flammability (solid, gas)	No data available
Upper/lower flammability or explosive limits	No data available
Vapour pressure	No data available
Vapour density	No data available
Relative density	No data available
Water solubility	No data available
Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	No data available
Decomposition temperature	No data available
Viscosity	No data available
Explosive properties	No data available
Oxidizing properties	No data available

9.2 Other safety information
No data available

SECTION 10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents, Strong acids

10.6 Hazardous decomposition products
Other decomposition products - No data available
In the event of fire: see section 5

SECTION 11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available
Dermal: No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: Not available

Vomiting, Diarrhoea, Dehydration and congestion may occur in internal organs. Hypertonic salt solutions can produce inflammatory reactions in the gastrointestinal tract., To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

SECTION 12. ECOLOGICAL INFORMATION

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Other adverse effects

No data available

SECTION 13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product

SECTION 14. TRANSPORT INFORMATION

14.1 UN Number

ADR/RID: - IMDG: - IATA: -

14.2 UN Proper Shipping Name

ADR/RID: Not dangerous goods
IMDG: Not dangerous goods
IATA: Not dangerous goods

14.3 Transport hazard class(es)

ADR/RID: - IMDG: - IATA: -

14.4 Packing group

ADR/RID: - IMDG: - IATA: -

14.5 Environmental hazards

ADR/RID: No IMDG Marine pollutant: No IATA: No

14.6 Special precautions for user

No data available.

SECTION 15. REGULATORY INFORMATION

This safety datasheet complies with the requirements of Regulation (EC) No. 1907/2006.

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

No data available

15.2 Chemical Safety Assessment

No data available

SECTION 16. OTHER INFORMATION

The advice offered is derived from the current available information on the hazardous materials in this product and it component(s). Consideration has been made regarding the quantities offered in the pre dispensed container. The advice offered is, therefore not all inclusive nor should it be taken as the descriptive of the compound generally.