Participant Guide for Aquatic Invasive Species Sampling with eDNA

First of all, thank you! If you are reading this guide it means you have expressed an interest in a pilot project designed to help invasive species managers better understand the distribution of some of Ontario's most significant aquatic invaders.

This pilot project is very exciting to us for a number of reasons, but none more important than the fact that it provides people an opportunity to care for the lakes they hold dear. In addition to that, this will be one of the first times that eDNA sampling will be applied to community science.

We have designed this pilot program with two goals in mind:

1. To help people like you learn more about the lakes you value most.
2. To provide policy makers, biologists, and natural resource managers with the information they need to make important management decisions.

Our ask of you is simple – to combine your love of your lake with a small amount of volunteer time to help us detect aquatic invasive species (AIS). We have produced a set of resources to help you gain the basic skills needed to collect high-quality eDNA samples for testing.

How it works:

- We send you all equipment and instructions required to collect eDNA from lake water samples to detect the presence of AIS.
- You read this participant guide, sampling protocol (below) and watch a short sampling video found at www.invasivespeciescentre.ca/eDNA.
- You collect samples from your lake.
- You mail samples back to us for processing in our lab.
- At the end of the year, once we have collected all the data from participants across Ontario, we will let you know what we found (or hopefully didn't find).

Sampling timeline

You are required to sample your lake at two different times throughout the year. This is important because different species shed DNA at different times.

- Sampling event #1: Invasive aquatic plants, September long weekend
- Sampling event #2: Invasive fish and invertebrates, October long weekend

Note: Wait at least one day after a heavy rainfall to collect samples.

During each sampling event, you will collect water from your lake and pass it through a filter, following the steps laid out in the protocol, and then send the filter to us for eDNA testing.

After samples have been filtered, the bagged filter cartridge must be kept in the refrigerator until sent, and should be returned within three days of sampling.

Lake and sampling site selection

- We've strategically identified priority lakes based on a number of key factors (probability of species introduction, geographic coverage, etc.) so we ask you to collect your samples from your one assigned lake.
- For each of the two sampling events, you must collect water from three sites on your lake. These sites should have clear water and be a minimum of 200 meters away from one another. Choosing sample collection sites that also meet the following criteria will further improve our chance of detecting DNA from our priority species:

  Sampling Event #1: Aquatic Plants

  - Water depths of approximately 3-6 feet
  - Relatively protected from fast moving water (e.g., in a bay not a river)

  Sampling Event #2: Fish and Invertebrates

  - Water depths of approximately 4-8 feet
  - Less protected than plan sampling but still avoiding fast flowing conditions

After you collect your sample

- Follow the steps explained in 'post-sampling' table below
- Once we receive all samples they will be processed in the lab
- Data will then be summarised and distributed in a report to all program participants

We are very excited that you have decided to participate in this pilot project. With the help of community scientists like you, we will collect critical information to inform decisions and action on priority AIS. Thank you for helping to protect the Ontario's freshwater ecosystems. For more information on this project, visit www.invasivespeciescentre.ca/eDNA.

eDNA Community Science Sampling Protocol

To ensure a safe and fun experience for all, and to assist with the collection of high-quality samples, please thoroughly review all communications provided, including this protocol, before doing any sampling. For additional guidance, watch the short sampling protocol video found on the Invasive Species Centre's YouTube page.

Please follow the steps outlined below for **both** sampling events – the one in September for invasive plants and the other in October for invasive fish and invertebrates.

Sampling will be easier with two sets of hands. Two pairs of gloves are included in each kit to accommodate a sampling buddy. Although the gloves are size large, they can be adapted for smaller users by placing elastic bands around wrists.

PROTOCOL

PRE-SAMPLING	
	Review this protocol and all other communications provided and watch the sampling video.
	Check the weather and lake conditions to make sure it is safe to proceed.
	Collect your supplies, which are packaged in two separate bags. The bag labelled "Sampling event #1: Plants" will be used for the first sampling event in September, while the other bag labelled "Sampling event #2: Fish and invertebrates" will be used for the second sampling event in October.
	For each sampling event, you will collect water at three sites on the same lake that are a minimum of 200 m apart. The water at these sites should be clear. Refer to the Participant Guide for more guidance on choosing your three sites.
	If it's necessary to go into the water, first make sure that it is safe to do so. If sampling from a boat, wear a life jacket and follow all water safety practices and regulations.

SAMPLING	
1	Go to your first water collection site and record the coordinates on the green datasheet provided.
2	Take out one small bag from your kit. Tear off the perforated seal at the top, place the bag just below the surface of the water and fill bag to capacity with lake water. To seal the bag please remove approximately 20% of the volume. This will allow you to seal the bag by rolling the perforated edge and tightening with the yellow twist tie. Place the bag in a safe location away from the sun.
3	Move to your second water collection site and follow step 2 using a new small bag.
4	Move to your third water collection site and follow step 2 using a new small bag.

Return to shore with three small bags of water to complete steps 5 to 11, which will take no more than 60 minutes.

5	Retrieve the large bag from your kit, open it and carefully empty all three small bags into this large one. Seal the large bag using the fold and tie method mentioned above. Thoroughly mix the water by gently rocking it back and forth ten times.
6	Put on the gloves.
7	Take out a syringe and place the tip in the large bag of water to draw-up 60 mL of water.
8	Take out the capsule filter and attach it to the bottom of the full syringe.
	TIP: Be careful not to touch either end of the filter to avoid contamination.

9	Holding the capsule filter in place, push the water through the filter, making sure to eject it away from the bag. Remove the filter capsule.
10	Repeat steps7 to 9 repeatedly until there is no water left in the large bag or until it becomes difficult to push water through the filter. With each pass at filtering, the effort required is greater, and the water leaves the filter more slowly. If on your final pass, you cannot push the plunger down any more, it is acceptable to stop half-way through.
	TIP: Record the volume of water that passes through the filter on the datasheet.
11	Discard any remaining lake water, and dispose of the syringe and plastic bags appropriately.
	TIP: Be careful not to touch either end of the filter to avoid contamination.

Once you are done passing water through the filter, it is time to add a phosphate buffered saline (PBS) solution to clean the filter of anything that might damage the DNA. *See below for safety information.

12	Open the second syringe package and remove the plunger from the receptacle.
13	Attach the syringe to the filter capsule with a twist.
	TIP: Be careful not to touch either end of the filter to avoid contamination.
14	Uncap the large tube containing PBS and pour directly into the top of the syringe receptacle. Re-attach the plunger.
15	Take one of the small bags you used to collect lake water sample and position below the filter capsule to collect PBS after it is pushed through the capsule. This bag will hold the used PBS until you are able to dispose of it.
16	Remove the syringe from the filter capsule, draw the syringe back to 60 mL, re-attach the syringe, and push air through the filter to remove trapped particles. Tip: Be careful not to touch either end of the filter to avoid contamination.

17	Remove the filter capsule from the syringe for the last time, being careful not to touch the exposed ends.

Now it is time to preserve and seal the filter and prepare it for shipping.

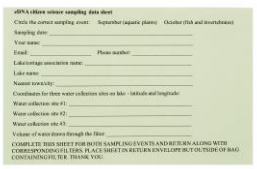
18	Close one of the exposed ends of the filter capsule with the sealing clay provided.
19	Find the pipette and small tube containing the liquid preservative. Uncap the tube and use the pipette to draw up 0.9 mL of the preservative.
20	Fit the pipette tip into the filter capsule opening and empty the preservative into the filter. This is a slow process.
21	Use the cap provided to close the open end of the filter capsule.
22	The filter capsule now contains your preserved eDNA sample and is ready to ship. Place it in the remaining small bag (labelled with sampling event info and lake name) and seal.

POST-SAMPLING	
	Place the i) sealed labelled bag containing the filter and ii) completed datasheet in the small, bubbled shipping envelope. Seal, and store in a refrigerator.
	Mail to the address indicated on the package within three days of collection.

*The Material Safety Data Sheet for PBS (Gibco PBS, PH 7.4) and preservative (Qiagen Buffer ATL) recommends common safety precautions such as hand and eye protection, suitable protective clothing, and use in an outdoor or ventilated setting. We encourage anyone working with any product provided in this kit to consult the manufacturer's websites for additional information.

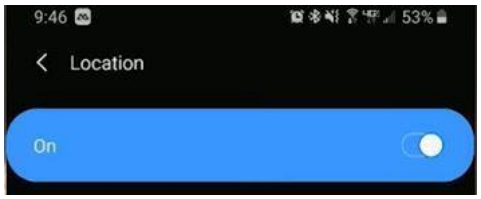
Natasha Serrao, University of Waterloo; Colin Cassin, Colleen Cirillo, Invasive Species Centre
Recommended citation: Serrao, N., Cassin, C., Cirillo, C., 2021. Participant Guide for Aquatic Invasive Species Sampling with eDNA. Green Shovels Collaborative.

EQUIPMENT PROVIDED

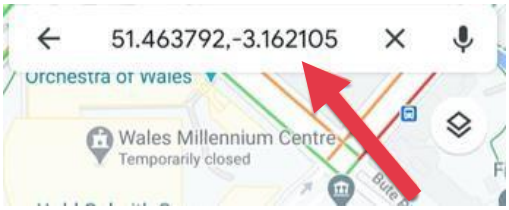
			
Latex-free gloves (2 pairs)	Syringe (2)	Capsule filter (1)	Large tube containing PBS (1)
			
Sealing clay (1 ball)	Pipette (1)	Small tube with preservative (1)	Cap (1)
			
Small bag (4) 1 x labelled (sampling event + lake name) 3 x sample collection	Large bag (1)	Return shipping envelope (1)	Pencil (1)
			
Waterproof datasheet (1)			

How to Determine GPS Coordinates on your Mobile Device or computer

On Google Maps (Android App)



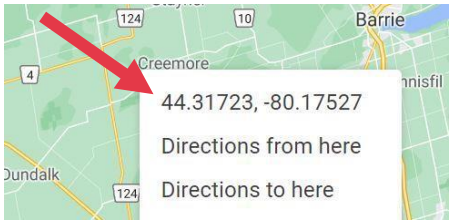
1. Open the Google Maps app.
2. Ensure your location can be accessed by the app. If not:
    i. Swipe down to see your settings.
    ii. Tap 'Location' and make sure the switch at the top is on.
3. Drop a pin by touching and holding your current area on the map.
4. You'll see the coordinates in the search box at the top.



On Google Maps (Computer)

- On your computer, open Google Maps.
- Right-click the desired area on the map. You can use the target at the bottom to search your current location.

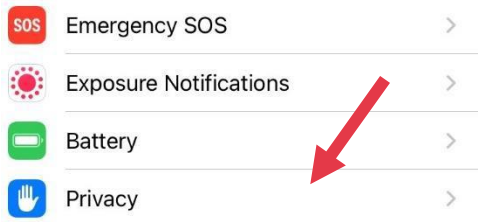
- Click the latitude and longitude, this will automatically copy the coordinates to your clipboard.



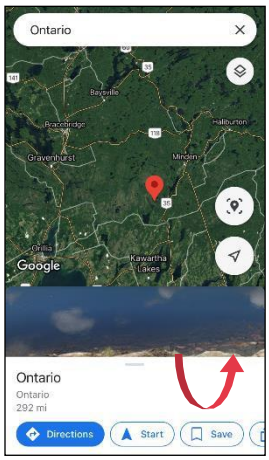
How to Determine GPS Coordinates on your Mobile Device or computer

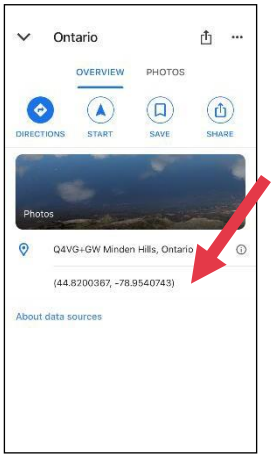
On Google Maps (iPhone or iPad App)

- On your iPhone or iPad, open the Google Maps app.
- Ensure your location can be accessed by the app. If not:
    - Go to your Settings app.
    - Scroll down and select ‘Privacy’.
    - Make sure the location services are on.



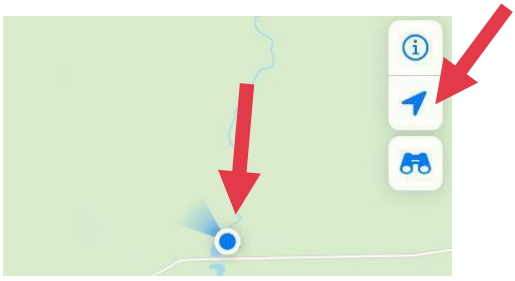
- Drop a pin by touching and holding your current area on the map.
- Tap the dropped pin and swipe up on the information menu to see the coordinates.





On Maps (iPhone or iPad App)

- Launch the Maps app.
- Ensure your location can be accessed by the app. If not:
    - Go to your Settings app.
    - Scroll down and select ‘Privacy’.
    - Make sure the location services are on.
- Tap the location arrow in the upper right corner of the screen (it will turn blue).
- Tap on the blue dot, which represents your location.
- Swipe up on the information menu to see the coordinates.

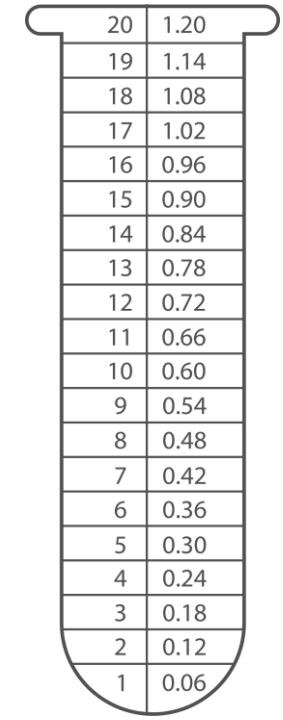


eDNA Citizen Science Sampling Data Sheet

Sampling event:	September (aquatic plants) ☐	October (fish and invertebrates) ☐
Sampling date:		
Your name:		
Email:		
Phone number:		
Lake/cottage association name:		
Lake name:		
Nearest town/city:		
Coordinates for three water collection sites on lake - latitude and longitude **Tip:** See guide to learn how to collect location information from a smartphone		
Site #1:		
Site #2:		
Site #3:		
Volume of water drawn through the filter	*Note: Diagram (right) can help you track filtering progress & vol. of water sampled.*	

Complete this sheet for each of the two sampling events and place inside the bubbled mailer alongside the bagged corresponding filter. Thank you.

www.invasivespeciescentre.ca/eDNA



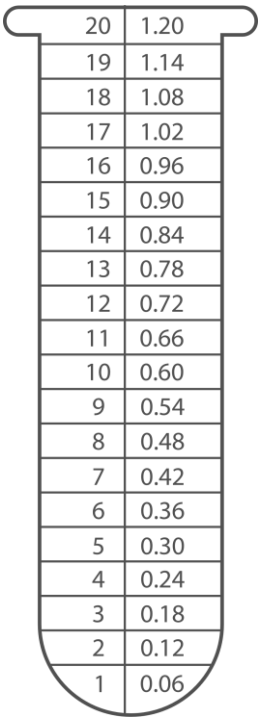
GREEN SHOVELS COLLABORATIVE

eDNA Citizen Science Sampling Data Sheet

Sampling event:	September (aquatic plants) ☐	October (fish and invertebrates) ☐
Sampling date:		
Your name:		
Email:		
Phone number:		
Lake/cottage association name:		
Lake name:		
Nearest town/city:		
Coordinates for three water collection sites on lake - latitude and longitude **Tip:** See guide to learn how to collect location information from a smartphone		
Site #1:		
Site #2:		
Site #3:		
Volume of water drawn through the filter	*Note: Diagram (right) can help you track filtering progress & vol. of water sampled.*	

Complete this sheet for each of the two sampling events and place inside the bubbled mailer alongside the bagged corresponding filter. Thank you.

www.invasivespeciescentre.ca/eDNA



GREEN SHOVELS COLLABORATIVE

Safety Data Sheet

SECTION 1: Identification of the substance/mixture and of the company/undertaking

Identification of the substance or mixture

Product code 10010023
Product name PBS, PH 7.4

Company/undertaking identification

Life Technologies Corporation
5781 Van Allen Way
PO Box 6482
Carlsbad, CA 92008
+1 760 603 7200

Life Technologies
5250 Mainway Drive
Burlington, ONT
CANADA L7L 6A4
800/263-6236

24 hour Emergency Response for Hazardous Materials [or Dangerous Goods] Incident. Spill, Leak, Fire, Exposure, or Accident. Call CHEMTREC
Within the USA + Canada: 1-800-424-9300 and +1 703-527-3887
Outside the USA + Canada: +1 703-741-5970

Country Specific Emergency Number (if available):
CHEMTREC Brazil (Rio De Janeiro) +(55)-2139581449 (português)

For in vitro diagnostic use.

SECTION 2: Hazards identification

GHS - Classification

Signal Word
None

Hazard pictograms

None

Health hazards
Not Hazardous

Physical hazards
Not Hazardous

Environmental hazards
Not Hazardous

Hazard Statements

Not Applicable

Precautionary Statements

Prevention
Not Applicable

Response
Not Applicable

Storage
Not Applicable

Disposal
Not Applicable

Other hazards
Not Applicable

HMIS

Health	0
Flammability	0
Reactivity	0

SECTION 3: Composition/information on ingredients

The product contains no substances which at their given concentration, are considered to be hazardous to health. We recommend handling all chemicals with caution.

SECTION 4: First aid measures

Description of first aid measures

Skin contact Rinse with plenty of water . Immediate medical attention is not required.

Eye contact Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.

Ingestion Not expected to present a significant ingestion hazard under anticipated conditions of normal use. If you feel unwell, seek medical advice.

Inhalation Not expected to be an inhalation hazard under anticipated conditions of normal use of this material. Consult a physician if necessary.

Notes to Physician Treat symptomatically.

Most important symptoms and effects, both acute and delayed
Not Applicable

Indication of any immediate medical attention and special treatment needed
None.

SECTION 5: Firefighting measures

Extinguishing media

Suitable extinguishing media	Water spray. Carbon dioxide (CO2). Foam. Dry chemical.
Unsuitable extinguishing media	No information available.

Special hazards arising from the substance or mixture
Not known.

Advice for fire-fighters
Standard procedure for chemical fires.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures
Ensure adequate ventilation
Always wear recommended Personal Protective Equipment.
Use personal protection equipment
See Section 8 for more detail.

Environmental precautions
No special environmental precautions required.

Methods and material for containment and cleaning up
Soak up with inert absorbent material.

Reference to other sections
See section 8 for more information.

SECTION 7: Handling and storage

Precautions for safe handling
Use personal protective equipment as required. No special handling advices are necessary.

Conditions for safe storage, including any incompatibilities
Keep in a dry, cool and well-ventilated place. Keep in properly labeled containers.

Specific end use(s)
For in vitro diagnostic use.

SECTION 8: Exposure controls/personal protection

Control parameters

Exposure Limits	Contains no substances with occupational exposure limit values.
Engineering measures	Ensure adequate ventilation, especially in confined areas.

Exposure controls

Personal Protective Equipment

Respiratory protection	In case of insufficient ventilation wear respirators and components tested and approved under appropriate government standards.
Hand protection	Wear suitable gloves. Glove material: Compatible chemical-resistant gloves.
Eye protection	Tight sealing safety goggles.
Skin and Body Protection	Wear suitable protective clothing.
Hygiene measures	Handle in accordance with good industrial hygiene and safety practice

Environmental exposure controls
No special environmental precautions required.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Appearance	liquid	
Odor	No data available	
pH	7.4	
Melting point / melting range	**°C** Mixture has not been tested	**°F** Mixture has not been tested
Boiling point / boiling range	**°C** Mixture has not been tested	**°F** Mixture has not been tested
Flash point	**°C** Mixture has not been tested	**°F** Mixture has not been tested
Autoignition Temperature	**°C** Mixture has not been tested	**°F** Mixture has not been tested
Decomposition temperature	**°C** Mixture has not been tested	**°F** Mixture has not been tested
Evaporation rate	No data available	
Flammability (solid, gas)	No data available	
Upper explosion limit	Mixture has not been tested	
Lower explosion limit	Mixture has not been tested	
Vapor Pressure	Mixture has not been tested	
Relative density	Mixture has not been tested	
Specific gravity	No data available	
Solubility	No data available	
Partition coefficient: n-octanol/water	No data available	
Explosive properties	Mixture has not been tested	

Other information
No data available.

SECTION 10: Stability and reactivity

Reactivity	None known.
Chemical stability	Stable under normal conditions.
Possibility of hazardous reactions	Hazardous reaction has not been reported.
Conditions to avoid	No information available.
Incompatible materials	No dangerous reaction known under conditions of normal use.
Hazardous decomposition products	No data available.

SECTION 11: Toxicological information

Information on toxicological effects

There is no evidence available indicating acute toxicity.

Principal Routes of Exposure

Irritation	Conclusive but not sufficient for classification .
Corrosivity	Conclusive but not sufficient for classification
Sensitization	Conclusive but not sufficient for classification .
STOT - Single Exposure	Conclusive but not sufficient for classification
STOT - Repeated Exposure	Conclusive but not sufficient for classification
Carcinogenicity	Conclusive but not sufficient for classification
Mutagenicity	Conclusive but not sufficient for classification .
Reproductive toxicity	Conclusive but not sufficient for classification .
Aspiration hazard	Conclusive but not sufficient for classification

SECTION 12: Ecological information

Toxicity
Contains no substances known to be hazardous to the environment or not degradable in waste water treatment plants.

Persistence and degradability	No information available.
Bioaccumulative potential	No information available.

Results of PBT and vPvB assessment
This mixture does not contain any substances that are assessed to be a PBT or a vPvB.

Other adverse effects	No information available.

SECTION 13: Disposal considerations

Waste treatment methods
The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in according to approved disposal technique. Disposal of this product, its solutions or of any by-products, shall comply with the requirements of all applicable local, regional or national/federal regulations.

SECTION 14: Transport information

IATA / ADR / DOT-US / IMDG
Not regulated in the meaning of transport regulations.

UN number	Not Applicable
UN proper shipping name	Not Applicable
Transport hazard class(es)	Not Applicable
Packing group	Not Applicable

Environmental hazards
Not Applicable

Special precautions for user
Not Applicable

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not Applicable.

SECTION 15: Regulatory information

US Federal Regulations

SARA 313
This product is not regulated by SARA.

Clean Air Act, Section 112 Hazardous Air Pollutants (HAPs) (see 40 CFR 61)
This product does not contains HAPs.

US State Regulations

California Proposition 65
This product does not contain any Proposition 65 chemicals.

WHMIS Hazard Class
Non-controlled

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all the information required by the CPR.

SECTION 16: Other information

Reason for revision	SDS sections updated.
Revision number	3
Revision date	08-Feb-2018

For in vitro diagnostic use.

References

- ECHA: http://echa.europa.eu/
- TOXNET: http://toxnet.nlm.nih.gov/
- eChemPortal: http://www.echemportal.org/
- LOLI database: https://www.chemadvisor.com/loli-database

"The above information was acquired by diligent search and/or investigation and the recommendations are based on prudent application of professional judgment. The information shall not be taken as being all inclusive and is to be used only as a guide. All materials and mixtures may present unknown hazards and should be used with caution. Since the Company cannot control the actual methods, volumes, or conditions of use, the Company shall not be held liable for any damages or losses resulting from the handling or from contact with the product as described herein. THE INFORMATION IN THIS SDS DOES NOT CONSTITUTE A WARRANTY, EXPRESSED OR IMPLIED,INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE"

End of Safety Data Sheet

SAFETY DATA SHEET

Buffer ATL

Version 1.0 Revision Date 08/25/2017 Print Date 03/30/2021

SECTION 1. IDENTIFICATION

Product name : Buffer ATL

Manufacturer or supplier's details

Company : QIAGEN GmbH
QIAGEN Str. 1
D-40724 Hilden

Telephone : +49-02103-29-0

Responsible Department : QIAGEN Inc.
19300 Germantown Road
Germantown, MD 20874, USA
Tel.: 800-426-8157
http://support.qiagen.com

E-mail addressResponsible/issuing person : cpc@qiagen.com

Emergency telephone : CHEMTREC
USA & Canada 1-800-424-9300

Recommended use of the chemical and restrictions on use

Recommended use : Laboratory chemicals

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification

Not a hazardous substance or mixture.

GHS Label element

Not a hazardous substance or mixture.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous ingredients

Chemical Name	CAS-No.	Concentration (% w/w)
sodium dodecyl sulfate	151-21-3	>= 1 - < 10

SECTION 4. FIRST AID MEASURES

General advice	:	Show this material safety data sheet to the doctor in attendance.
If inhaled	:	Move to fresh air. If symptoms persist, call a physician.
In case of skin contact	:	Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. If symptoms persist, call a physician.
In case of eye contact	:	Remove contact lenses. Protect unharmed eye. Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.
If swallowed	:	If accidentally swallowed obtain immediate medical attention. Rinse mouth with water. Never give anything by mouth to an unconscious person.
Most important symptoms and effects, both acute and delayed	:	No information available.
Notes to physician	:	No information available.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Specific hazards during fire fighting	:	Exposure to decomposition products may be a hazard to health.
Hazardous combustion products	:	Carbon oxides Nitrogen oxides (NOx) Sulfur oxides
Specific extinguishing methods	:	In the event of fire and/or explosion do not breathe fumes.
Special protective equipment for fire-fighters	:	Wear self-contained breathing apparatus for firefighting if necessary.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Use personal protective equipment. Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.
Environmental precautions	:	Prevent further leakage or spillage if safe to do so.
Methods and materials for containment and cleaning up	:	Keep in suitable, closed containers for disposal.

SECTION 7. HANDLING AND STORAGE

Advice on protection against fire and explosion	:	Normal measures for preventive fire protection.
Advice on safe handling	:	Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Dispose of rinse water in accordance with local and national regulations.
Conditions for safe storage	:	Keep container tightly closed in a dry and well-ventilated place.
Materials to avoid	:	Do not store near acids.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Contains no substances with occupational exposure limit values.

Hazardous components without workplace control parameters

Ingredients	CAS-No.
sodium dodecyl sulfate	151-21-3

Personal protective equipment

Hand protection

Remarks	:	The choice of an appropriate glove does not only depend on its material but also on other quality features and is different from one producer to the other. Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact).
Eye protection	:	Safety glasses
Skin and body protection	:	Choose body protection according to the amount and concentration of the dangerous substance at the work place. Footwear protecting against chemicals
Hygiene measures	:	Keep away from food and drink. Wash hands before breaks and at the end of workday. Ensure adequate ventilation, especially in confined areas. Avoid contact with the skin and the eyes. When using do not eat, drink or smoke.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	liquid
Color	:	No data available

Odor	:	characteristic
Odor Threshold	:	No data available
pH	:	8.3
Melting point/range	:	No data available
Boiling point/boiling range	:	No data available
Flash point	:	No data available
Evaporation rate	:	No data available
Burning rate	:	No data available
Upper explosion limit	:	No data available
Lower explosion limit	:	No data available
Vapor pressure	:	No data available
Relative vapor density	:	No data available
Relative density	:	No data available
Density	:	1.03 g/cm3
Solubility(ies)		
Water solubility	:	No data available
Solubility in other solvents	:	No data available
Partition coefficient: n-octanol/water	:	No data available
Autoignition temperature	:	not determined
Decomposition temperature	:	No data available
Viscosity		
Viscosity, dynamic	:	No data available
Viscosity, kinematic	:	No data available
Explosive properties	:	No data available
Oxidizing properties	:	No data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	No decomposition if stored and applied as directed.
Chemical stability	:	No decomposition if stored and applied as directed.

Possibility of hazardous reactions	:	Stable under recommended storage conditions. Hazardous decomposition products formed under fire conditions. Keep away from oxidizing agents, and acidic or alkaline products.
Conditions to avoid	:	No data available
Incompatible materials	:	No data available
Hazardous decomposition products	:	No decomposition if stored and applied as directed.

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Not classified based on available information.

Product:

Acute oral toxicity	:	No data available Acute toxicity estimate: > 5,000 mg/kg Method: Calculation method
Acute inhalation toxicity	:	No data available
Acute dermal toxicity	:	No data available Acute toxicity estimate: > 5,000 mg/kg Method: Calculation method

Ingredients:

sodium dodecyl sulfate:

Acute oral toxicity	:	LD50 Oral (Rat): 1,228 mg/kg
Acute inhalation toxicity	:	LC50 (Rat): 3.9 mg/l Exposure time: 1 h Test atmosphere: dust/mist
Acute dermal toxicity	:	LD50 Dermal (Rabbit): 580 mg/kg

Skin corrosion/irritation

Not classified based on available information.

Product:

Remarks:
May cause skin irritation and/or dermatitis.

Ingredients:

sodium dodecyl sulfate:
Species: Rabbit
Exposure time: 24 h
Result: Irritating to skin.

Serious eye damage/eye irritation

Not classified based on available information.

Product:

Remarks:
The product causes irritation of eyes, skin and mucous membranes.

Ingredients:

sodium dodecyl sulfate:
Species: Rabbit
Result: Risk of serious damage to eyes.
Method: OECD Test Guideline 405

Respiratory or skin sensitization

Skin sensitization: Not classified based on available information.
Respiratory sensitization: Not classified based on available information.

Germ cell mutagenicity

Not classified based on available information.

Carcinogenicity

Not classified based on available information.

IARC	No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
OSHA	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
NTP	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity

Not classified based on available information.

STOT-single exposure

Not classified based on available information.

Ingredients:

sodium dodecyl sulfate:
Routes of exposure: Inhalation
Assessment: May cause respiratory irritation.

STOT-repeated exposure

Not classified based on available information.

Aspiration toxicity

Not classified based on available information.

Further information

No data available

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Product:

Toxicity to fish	:	No data available
Toxicity to algae	:	No data available
Toxicity to bacteria	:	No data available

Ingredients:

sodium dodecyl sulfate:

Toxicity to fish	:	NOEC (Oncorhynchus mykiss (rainbow trout)): 19.5 mg/l Exposure time: 96 h LC50 (Oncorhynchus mykiss (rainbow trout)): 3.6 mg/l Exposure time: 96 h
Toxicity to algae	:	(Pseudokirchneriella subcapitata (green algae)): 2.68 mg/l Exposure time: 150 h Test Type: Growth inhibition

Persistence and degradability

No data available

Bioaccumulative potential

Product:

Bioaccumulation	:	No data available

Ingredients:

sodium dodecyl sulfate:

Partition coefficient: n-octanol/water	:	log Pow: 1.6

Mobility in soil

No data available

Other adverse effects

Product:

Ozone-Depletion Potential	:	Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).
Additional ecological information	:	No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues	:	Send to a licensed waste management company. Dispose of as hazardous waste in compliance with local and national regulations.
Contaminated packaging	:	Dispose of as unused product. Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION

UNRTDG
Not regulated as a dangerous good

IATA-DGR
Not regulated as a dangerous good

IMDG-Code
Not regulated as a dangerous good

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
No data available

Domestic regulation

49 CFR
Not regulated as a dangerous good

SECTION 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know

SARA 304 Extremely Hazardous Substances Reportable Quantity
This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards	:	No SARA Hazards
SARA 302	:	No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.
SARA 313	:	This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

US State Regulations

California Prop. 65	This product does not contain any chemicals known to the

State of California to cause cancer, birth, or any other reproductive defects.

TSCA list

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

SECTION 16. OTHER INFORMATION

Full text of other abbreviations

(Q)SAR - (Quantitative) Structure Activity Relationship; ASTM - American Society for the Testing of Materials; bw - Body weight; DIN - Standard of the German Institute for Standardisation; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISO - International Organisation for Standardization; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative; DSL - Domestic Substances List (Canada); KECI - Korea Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); AICS - Australian Inventory of Chemical Substances; IECSC - Inventory of Existing Chemical Substances in China; ENCS - Existing and New Chemical Substances (Japan); ISHL - Industrial Safety and Health Law (Japan); PICCS - Philippines Inventory of Chemicals and Chemical Substances; NZIoC - New Zealand Inventory of Chemicals; TCSI - Taiwan Chemical Substance Inventory; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; DOT - Department of Transportation; EHS - Extremely Hazardous Substance; HMIS - Hazardous Materials Identification System; MSHA - Mine Safety and Health Administration; NFPA - National Fire Protection Association; RCRA - Resource Conservation and Recovery Act; RQ - Reportable Quantity; SARA - Superfund Amendments and Reauthorization Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; GLP - Good Laboratory Practice; ERG - Emergency Response Guide; NTP - National Toxicology Program; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods

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The information provided in this Material Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.