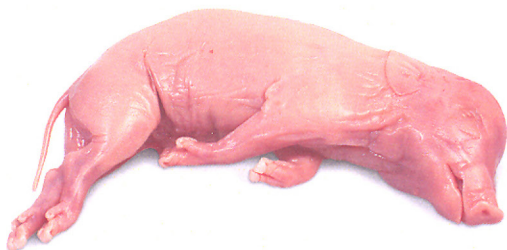


NASCO-Guard® Specimens are the best and safest that money can buy. The unique NASCO-Guard® process for preserving specimens has been patented under Patent No. 3573082. Most NASCO-Guard® Specimens are initially fixed in a 3.7% formaldehyde solution, which is still the best animal tissue fixative known. In the NASCO-Guard® process, skilled Nasco technicians remove the formaldehyde fixative in a series of water baths, then painstakingly perfuse the specimens with propylene glycol until tissue fluids contain at least 25% glycol; this inhibits the growth of decay organisms by raising the osmotic pressure of the specimen. Propylene glycol also acts as a humectant to ensure moist specimens, and it lowers the vapor pressure of formaldehyde, thus markedly reducing the concentration of formaldehyde fumes in the lab. Perfusion also washes away water-soluble carbohydrates and proteins that could nourish decay organisms. Remaining formaldehyde is further reduced as it reacts with propylene glycol to form hemiacetals and acetals that have a very low order of toxicity. Large embalmed mammals may contain trace amounts of phenol.

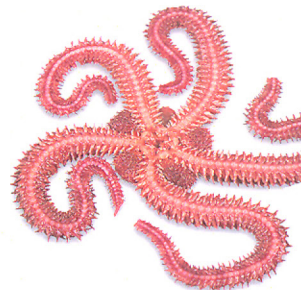
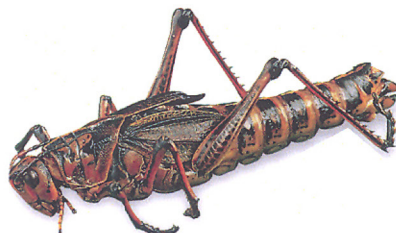


To comply with the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard (HCS) 29CFR, 1910.1200, the user of this product is advised that a small percentage of formaldehyde may be present. Material Safety Data Sheet (MSDS) information is available from:

Nasco
Dept. MSDS
901 Janesville Avenue
Fort Atkinson, WI 53538-0901

Printed in U.S.A.
NP 101/RV 1-14

How to Maintain & Dispose of Your

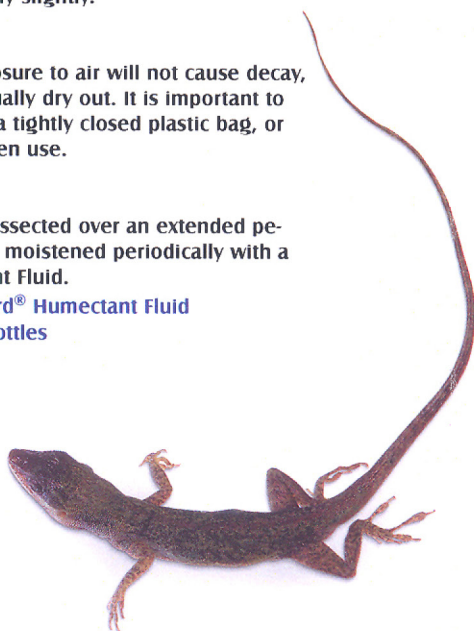


NASCOGuard®
PATENT NO. 3573082
**Preserved
Specimens**



**Odorless, Nontoxic NASCO-Guard® Specimens
Will Remain Preserved Indefinitely
If Care Is Taken In Following These Instructions**

1. If specimens are to be stored for an unusually long period of time (six months or more) leave specimens in containers supplied. As long as the original seal is unbroken, specimens will remain usable indefinitely. If seal on specimen bag is broken during shipment, the shelf life of the specimens is affected only slightly.
2. Keep tightly sealed. Exposure to air will not cause decay, but specimens will gradually dry out. It is important to return the specimens to a tightly closed plastic bag, or airtight container, between use.
3. If specimens are to be dissected over an extended period of time, they can be moistened periodically with a NASCO-Guard® Humectant Fluid.
Ready-to-Use NASCO-Guard® Humectant Fluid
SB17218M — Five 1-gal. bottles
SB12631M — 1-gal. bottle
SB32395M — 1-qt. bottle
SB32396M — 1-pt. bottle
4. DO NOT ADD WATER. Do not add formaldehyde, or any other preservative to NASCO-Guard® specimens. Your specimens are completely preserved and the addition of water or other preservatives might have undesirable effects on the specimens.
5. NASCO-Guard® specimens may occasionally have an odor common to the animal itself (e.g., fish). Since there is no chemical odor, however, large capacity ventilation systems that are needed when formaldehyde is used are not necessary when using NASCO-Guard® preserved materials.
6. Because specimens may have been originally fixed in formaldehyde or glutaraldehyde by some of our collectors, a trace may remain. Individuals who are sensitive to these chemicals should take the usual precautions when handling specimens.
7. DISPOSAL OF SPECIMENS: NASCO-Guard® specimens are biodegradable. They are suited for burial in an approved sanitary landfill or for incineration. Ambient fluids may be safely disposed via city sewers.





MATERIAL SAFETY DATA SHEET

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

Product Name: Nasco- Guard

MANUFACTURER:

NASCO
901 Janesville Ave.
Fort Atkinson, WI 53538

INFORMATION TELEPHONE NUMBER:

24-Hour Contact: CHEMTREC
800-424-9300
General Information: 800-558-9595

SECTION 2- HAZARDS IDENTIFICATION

DANGER
MAY CAUSE CANCER WHEN INHALED
MAY CAUSE EYE AND RESPIRATORY TRACT IRRITATION

Relevant Routes of Exposure

Inhalation, eye contact, skin contact

Inhalation

May cause irritation to eyes and respiratory system. Formaldehyde has been classified as a known human carcinogen. The risk of injury depends on duration and level of exposure. This product contains a small amount of formaldehyde; exposures during expected use conditions are expected to be low.

Eye

May cause irritation

Skin

May cause an allergic skin reaction with direct liquid contact

Ingestion

Ingestion of this product is unlikely, however, if ingested in sufficient quantities, it may cause metabolic acidosis.

Medical Conditions Aggravated by Exposure

Pre-existing respiratory disorders may be aggravated by exposure

Target Organs

Eyes, respiratory tract

See Section 11: TOXICOLOGICAL INFORMATION for further information.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS #	EINECS #	Weight %
Propylene glycol	57-55-6	200-338-0	Less than 50%
Formaldehyde	50-00-0	200-001-8	>0.1% but <0.5%
Phenol	108-95-2	203-632-7	Less than 1%
Water	7732-18-5		Balance

SECTION 4: FIRST AID MEASURES

Eye Contact

If case of contact, immediately flush eyes with plenty of water. If easy to do, remove contact lenses if worn. Seek medical attention if irritation persists.

Inhalation

Move to fresh air. Treat symptomatically. Get medical attention if symptoms persist.

Skin

Wash affected area with soap and water. Seek medical attention if symptoms develop.

Ingestion

Call a physician or poison control center immediately. Only induce vomiting at the instruction of medical personnel. Never give anything by mouth to an unconscious person.

SECTION 5: FIRE FIGHTING MEASURES

Suitable Extinguishing Media

Use foam, carbon dioxide (CO₂), water fog or fine spray or dry chemical to extinguish fire.

Hazardous Decomposition Products

During a fire, smoke generated can be irritating or toxic. Products of combustion include but are not limited to carbon monoxide and carbon dioxide.

Special Protective Measures for Fire Fighter

Firefighters should wear self contained breathing apparatus and full fire fighting turnout gear.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal Precautions

Avoid breathing vapors. Use gloves to clean up spills.

Environmental Precautions

No special hazards. Follow applicable federal, state, provincial and local regulations regarding releases.

Methods for Containment and Clean-up

Absorb with liquid binding material. Dispose in accordance with federal, state, provincial and local regulations.

SECTION 7: HANDLING AND STORAGE

Precautions for Safe Handling

Do not eat, drink or smoke when using this product. Avoid breathing of vapors. Avoid direct eye contact with liquids. Do not ingest. Wash hands with soap and water after use or handling.

Conditions for Safe Storage, Including Any Incompatibilities

No special storage requirements.

SECTION 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Guidelines

Substance	OSHA PEL	ACGIH TLV	Other Limits
Propylene glycol	NE	NE	10 mg/m ³ (TWA) (OARS WEEL)
Formaldehyde	0.75 ppm (TWA) 2 ppm (STEL)	0.3 ppm (C) (SEN)	NE
Phenol	5 ppm (TWA)(S)	5 ppm (TWA)(S)	NE

Exposure Limit Abbreviations

NE=	No Limit Established
OSHA PEL=	Occupational Safety and Health Administration Permissible Exposure Limit
ACGIH TLV=	American Conference of Governmental Industrial Hygienists Threshold Limit Value [®] , 2013 Edition
OARS WEEL=	Occupational Alliance for Risk Science Workplace Environmental Exposure Limit
C=	Ceiling limit
TWA=	Time Weighted Average
STEL=	Short Term Exposure Limit
S=	Skin designation
SEN=	Sensitizer designation
ppm=	parts per million
mg/m ³ =	milligrams per cubic meter of air

Appropriate Engineering Controls

General ventilation is usually adequate to control exposures. Do not use product in a confined area or areas with little or no air movement. If ventilation is not adequate, use appropriate respiratory protection.

Personal Protective Equipment

Eye Protection

Safety eyewear should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes.

Skin protection

Use gloves if there is direct contact with the liquid. Butyl or nitrile rubber gloves are recommended. Wear lab coat if liquid splashes could occur.

Respiratory Protection

Under normal use conditions, airborne exposures are not expected to exceed applicable exposure limits. If a risk assessment indicates that such protection is necessary, a NIOSH approved air purifying respirator with organic vapor cartridges may be used.

Ingestion Exposure

Wash hands after handling and before eating. Do not consume or store food in the work area.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Solid
Appearance and Odor:	Clear colorless liquid. Faint disinfectant -like odor.
pH	Not applicable
Melting Point:	Not applicable
Initial boiling point & boiling range	Not applicable

Flash Point:	Not applicable
Evaporation Rate:	Not applicable
Flammability	Not applicable
Upper/Lower flammability or explosive limits	Not applicable
Vapor Pressure:	Not applicable
Vapor Density:	Not applicable
Relative Density	Not applicable
Solubility in Water	Not applicable
Partition Coefficient:	Not applicable
Auto-Ignition Temperature:	Not applicable
Decomposition Temperature:	Not applicable
Viscosity:	Not applicable

SECTION 10: STABILITY AND REACTIVITY

Reactivity

No dangerous reactions are expected under normal conditions of use.

Chemical Stability

Chemically stable under normal storage and handling conditions

Possibility of Hazardous Reactions

None known

Conditions to avoid

None known

Incompatible Materials

Avoid contact with strong acids, strong bases and strong oxidizers.

Hazardous Decomposition Products

Under expected usage conditions, hazardous decomposition products are not expected. Hazardous decomposition products such as carbon monoxide, aldehydes, alcohols, ethers, organic acids and other compounds may be generated when material is subjected to high temperatures or fires.

SECTION 11: TOXICOLOGICAL INFORMATION

Nasco-Guard has not been tested as a mixture. Information about the individual components is supplied.

Acute Toxicity

Formaldehyde

LD₅₀ Oral= 800 mg/kg (Rat)
 LC₅₀ = 400 mg/m³ (30 min; Mice)

Phenol

LD₅₀: 530 mg/kg (Oral; Rat)
 LD₅₀: 100 mg/kg (Oral; Cat)
 LD₅₀: 500 mg/kg (Oral; Dog)
 LD₅₀: 660-707 mg/kg (Dermal; Rat)
 LC₅₀ = 177 mg/m³ (30 min/Mice)

Propylene Glycol

LD₅₀: >20,000 mg/kg (Oral; Rat, Mouse)
 LD₅₀: >18,000 mg/kg (Dermal; Rabbit, Guinea pig, Dog)
 LC₅₀ = 317 mg/l (aerosol; 2 hr; Rabbit)

Skin Corrosion/Irritation

Formaldehyde

Administration onto the skin (rabbit): 2 mg/24 hr., Severe Irritant

Phenol

Not a sensitizer. Phenol is skin absorbable. Administration onto the skin (rabbit): 500 mg/24 hr., Severe Irritant

Propylene Glycol

May cause mild irritation, possibly due to dehydration of the skin

Eye Damage or Irritation

Formaldehyde

Administration into the eye (rabbit): 750 ug, Severe Irritant

Phenol

Concentrated solutions cause severe eye damage. Direct contact with the eye may cause redness, pain and blurred vision.

Propylene Glycol

May cause slight, temporary irritation. Corneal injury is not likely to occur.

Ingestion

May be harmful if swallowed.

Sensitization

Formaldehyde

Skin sensitizer in animal studies. No clear evidence of formaldehyde-induced asthma attributable to immunologic mechanisms has been identified. In some individuals contact dermatitis may occur.

Phenol

Not a sensitizer

Propylene Glycol

Did not cause allergic skin reactions when tested in humans. No relevant data for respiratory sensitization found.

Germ Cell Mutagenicity

Formaldehyde

Genotoxic effects after exposure via relevant routes are limited to those cells which are in direct contact with formaldehyde and no effects are observed in distant-site tissues.

Phenol

Negative and positive tests have been reported.

Propylene Glycol

Animal studies are in vitro tests were negative.

Component Carcinogenicity

Formaldehyde

Research studies of workers exposed to formaldehyde have suggested an association between formaldehyde exposure and several cancers, including nasopharyngeal cancer and leukemia. IARC-1 (Carcinogenic to Humans), NTP- K (Known to be a Human Carcinogen), AGCIH-A2 (Suspected Human Carcinogen), OSHA (Cancer Suspect Agent)

Phenol

Not listed

Propylene glycol

Not listed

Reproductive Effects

Formaldehyde

Does not have specific embryotoxic or teratogenic properties

Phenol

Does not have specific embryotoxic or teratogenic properties

Propylene glycol

Does not have specific embryotoxic or teratogenic properties

Specific Target Organ Toxicity-Single Exposure

Formaldehyde

Respiratory irritation.

Phenol

Acute ingestion and skin exposure can cause systemic effects such as anorexia, headache, dark urine, hypothermia, hypotension, arrhythmia and coma. At the phenol concentration in this product, these effects are not likely to occur.

Propylene glycol

May cause drowsiness or dizziness at high exposures when ingested.

Specific Target Organ Toxicity-Repeated Exposure

Formaldehyde

Effects limited to the area of contact (skin or respiratory tract).

Phenol

Adversely affects the nervous and hematopoietic systems; kidney, liver and skin. At the phenol concentration in this product, these effects are not likely to occur.

Propylene glycol

Repeated high exposure may cause central nervous system effects.

SECTION 12: ECOLOGICAL INFORMATION

General Product Information

Nasco-Guard has not been tested as a mixture. Information about the individual components is supplied.

Component Information

Formaldehyde

Unlikely to be a hazard because of the low percentage in the product as sold.

Phenol

Unlikely to be a hazard because of the low percentage in the product as sold.

Propylene glycol

Propylene glycol is essentially non-toxic to aquatic organisms on an acute basis. Biodegradable. Does not bioconcentrate.

SECTION 13: DISPOSAL INFORMATION

Dispose using methods which are in accordance with local, state, and federal regulations.

SECTION 14: TRANSPORTATION INFORMATION

The US Department of Transportation (DOT) under CFR 172 does not regulate this product as a hazardous material. All federal, provincial, state and local laws and regulations that apply to the transport of this material must be adhered to.

Shipping Name: NA Symbols: NA Hazard Class: NA UN #: NA Packing Group: NA DOT/IMO Label: NA Special Provisions: NA	Packaging Authorizations a) Exceptions: NA b) Group: NA c) Authorizations: NA	Quantity Limitations a) Passenger, Aircraft, or Railcar: NA b) Cargo Aircraft Only: NA Vessel Stowage Requirements a) Vessel Stowage: NA b) Other: NA
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The International Maritime Dangerous Goods (IMDG) and the Regulations Concerning the International Carriage of Dangerous Goods by Rail (RID) classification, packaging and shipping requirements follow the US DOT Hazardous Materials Regulation.

Shipping Name: NA Classification Code: NA	Packaging a) Packing Instructions: NA	Portable Tanks & Bulk Containers a) Instructions: NA
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UN No.: NA Packing Group: NA ADR Label: NA Special Provisions: NA Limited Quantities: NA Special Provisions: NA	b)Special Packing Provisions: NA c) Mixed Packing Provisions: NA	b) Special Provisions: NA
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IATA– International Air Transport Association (IATA) does not regulate this product as a hazardous substance.

Shipping Name: NA Class/Division: NA Hazard Label (s): NA UN No.: NA Packing Group: NA Excepted Quantities (EQ): NA	Passenger & Cargo Aircraft Cargo Aircraft Only (EQ) Pkg Inst: NA Max Net Qty/Pkg: NA	Cargo Aircraft Only Pkg Inst: NA Max Net Qty/Pkg: NA	Special Provisions: NA ERG Code: NA
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SECTION 15: REGULATORY INFORMATION

The following regulatory information may not be complete and should not be relied upon as the sole source of information regarding regulatory responsibilities.

Occupational Health and Safety Administration

This product as sold does not have a specific exposure limit but individual components of the material are regulated under the OSHA Air Contaminant Standard (1910.1000) and OSHA Formaldehyde Standard (1910.1048).

CERCLA Hazardous Substance List (40 CFR 302.4):

The following components are listed:

Formaldehyde (50-00-0): maximum 0.3% max by weight
 Phenol (108-95-2): maximum 0.1% by weight

US EPA (SARA Title III) Section 302

The following components are listed:

Formaldehyde (50-00-0): maximum 0.3% max by weight; Reportable quantity-100 lbs
 Phenol (108-95-2): maximum 0.1% by weight; Reportable quantity-500 lbs

SARA TITLE III, Sections 311-312 Hazard Category

This product has been reviewed according to the EPA Hazard Categories promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 and is considered a hazardous chemical and a delayed health hazard.

SARA Section 313 Information:

This product contains 2 substance subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

Formaldehyde (50-00-0): maximum 0.3% max by weight
 Phenol (108-95-2): maximum 0.1% by weight

California Proposition 65 Compliance

Warning: This product contains chemicals known to the State of California to cause cancer and birth defects (or other reproductive harm):

Formaldehyde (CAS # 50-00-0)

US - New Jersey RTK - Substances

The following components are listed:

Formaldehyde (50-00-0): maximum 0.3% max by weight
 Phenol (108-95-2): maximum 0.1% by weight

US - Pennsylvania RTK - Hazardous Substances

The following components are listed:



Formaldehyde (50-00-0): maximum 0.3% max by weight
 Phenol (108-95-2): maximum 0.1% by weight

Canadian DSL Inventory Status

All of the components are listed on the DSL Inventory

Canada-WHMIS (Workplace Hazardous Materials Information System)

The following components are listed:

Component	WHMIS Classification
Formaldehyde	D1A Very Toxic Material-Immediate
 	D2A Very Toxic Material-Carcinogenicity & Mutagenicity
	D2B Toxic Material- Skin sensitization

Canadian Environmental Protection act (CEPA)

None of the components are on the CEPA Priorities Substances Lists

SECTION 16: OTHER INFORMATION

DATE PREPARED: January 2, 2014 (Rev. 1)

(Original Issue: January 2, 2014)

This document has been prepared solely for the intent of compliance with the provisions of Subpart 2 of Part 1910 of Title 29 of the Code of Federal Regulations, paragraph 1910.1200. NASCO MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY, ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE AND ANY IMPLIED WARRANTIES OTHERWISE ARISING FROM COURSE OF DEALING OR TRADE.