1. Identification

1.1. Product identifier

Trade name	Protectosil® BHN
Chemical Name	Isobutyltriethoxysilane
CAS-No.	17980-47-1

1.2. Recommended use of the chemical and restrictions on use

Relevant applications identified	For industrial use
Function	Waterproofing agent

1.3. Details of the supplier of the safety data sheet

Company	Evonik Corporation USA 299 Jefferson Road Parsippany,NJ 07054-0677 USA
Telephone	973-929-8000
Telefax	973-929-8040
Email address	Product-Regulatory-Services@Evonik.com

1.4. 24 HOUR EMERGENCY TELEPHONE NUMBERS:

CHEMTREC - US & CANADA:	800-424-9300
CHEMTREC MEXICO:	01-800-681-9531
CHEMTREC INTERNATIONAL:	+1 703-527-3887 **(collect calls accepted)**
Product Regulatory Services :	973-929-8060

2. Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation 29CFR 1910.1200

Flammable liquids	Category 4	H227
Skin irritation	Category 2	H315
Acute aquatic toxicity	Category 3	H402

2.2. Label elements

Statutory basis: Classification according to Regulation 29CFR 1910.1200

Symbol(s):

Signal word	Warning
Hazard statement	H227 - Combustible liquid. H315 - Causes skin irritation. H402 - Harmful to aquatic life.
Precautionary statement: Prevention	P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking. P264 - Wash skin thoroughly after handling. P273 - Avoid release to the environment. P280 - Wear protective gloves/ eye protection/ face protection.
Precautionary statement: Reaction	P302 + P352 - IF ON SKIN: Wash with plenty of water/ soap. P332 + P313 - If skin irritation occurs: Get medical advice/ attention. P362 - Take off contaminated clothing and wash before reuse. P370 + P378 - In case of fire: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide to extinguish.
Precautionary statement: Storage	P403 + P235 - Store in a well-ventilated place. Keep cool.
Precautionary statement: Disposal	P501 - Dispose of contents/ container to an approved waste disposal plant.

2.3. Other hazards

None known.

3. Composition/information on ingredients

• **Isobutyltriethoxysilane**	<= 100%
CAS-No. 17980-47-1	
Flammable liquids	Category 4
Skin irritation	Category 2
Acute aquatic toxicity	Category 3

4. First aid measures

4.1. Description of first aid measures

General advice
Remove contaminated or saturated clothing immediately and dispose of safely.

Inhalation
If aerosol or mists are inhaled, take affected persons out into the fresh air. Possible discomforts include severe irritation of mucus lining (nose, throat, eyes), cough, sneezing and flow of tears. In case of persistent discomfort, obtain medical attention immediately.

Skin contact
Immediately wash skin with soap and plenty of water. Remove contaminated clothing. Obtain medical attention immediately if symptoms occur. Wash clothing before reuse.

Eye contact
In case of contact, immediately flush eyes with plenty of water, or if necessary, with eye rinsing solution. In case of persistent discomfort, consult an ophthalmologist.

Ingestion
If accidentally swallowed, rinse mouth thoroughly with water and afterwards, drink plenty of water. In case of discomfort, obtain medical attention.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms
None known

4.3. Indication of any immediate medical attention and special treatment needed

If required, therapy of irritative effect.
After absorbing large amounts of substance:
administration of activated charcoal.
Acceleration of gastrointestinal passage

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5. Fire-fighting measures

5.1. Extinguishing media

Suitable extinguishing media: water spray, Alcohol-resistant foam, Carbon dioxide (CO2), dry powder
Unsuitable extinguishing media: High volume water jet

5.2. Special hazards arising from the substance or mixture

Combustible liquid. Vapors can travel to a source of ignition and flash back. Explosive mixtures may occur at temperatures at or above the flashpoint.

5.3. Advice for firefighters

Water used to extinguish fire should not enter drainage systems, soil or stretches of water.
Ensure there are sufficient retaining facilities for water used to extinguish fire.
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
As in any fire, wear self-contained positive-pressure breathing apparatus, (MSHA/NIOSH approved or equivalent) and full protective gear.

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6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Ensure adequate ventilation. Use personal protective equipment.

6.2. Environmental precautions

Obey relevant local, state, provincial and federal laws and regulations. Do not contaminate any lakes, streams, ponds, groundwater or soil.

6.3. Methods and material for containment and cleaning up

Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

Additional advice
Remove sources of ignition and ventilate area.
Run off may create fire or explosion hazard in sewer.
Assure sufficient ventilation.

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7. Handling and storage

7.1. Precautions for safe handling

Use in the open air or with adequate ventilation. Wear personal protective equipment; see section 8. Keep away from heat, sparks, flames and other sources of ignition. Keep container tightly closed. Use only with adequate ventilation.
Vapors may spread long distances and travel to areas away from the work site before igniting or flashing back to the vapor source.

7.2. Conditions for safe storage, including any incompatibilities

Advice on protection against fire and explosion

Take precautionary measures against static charges, keep away from sources of ignition.
This material may have a low electrical conductivity and therefore may accumulate dangerous levels of static electricity. An ignitable vapor-air mixture can form inside storage tanks.

The user must be sure to dissipate static charge by careful bonding and grounding of all equipment and personnel involved in fluid transfer with continuity checks to prove effectiveness. Additional precautions against fire and explosion are the use of inert gas to purge vapor space; dip-pipes while filling vessels, especially lined vessels; grounded tank level floats; reduced flow velocity; self-closing valves on transfer lines and flame arrestors in vent lines.

Additional guidance on fire and explosion protection may be found in various consensus standards, including NFPA 30, 69 and 77 and API 2003 as well as OSHA regulation 29CFR1910.106.

Follow all MSDS/label precautions even after container is emptied because it may retain product residues.

Storage

Keep containers tightly closed in a cool, well-ventilated place. Protect from moisture.
Residual vapors might explode on ignition; do not apply heat, cut, drill, grind or weld on or near this container.

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8. Exposure controls/personal protection

8.1. Control parameters

Other information

Contains no substances with occupational exposure limit values.

DNEL/DMEL values

Remarks	not required

PNEC values

	Freshwater
Value	0.17 mg/l
	marine water
Value	0.017 mg/l
	Fresh water sediment
Value	14 mg/kg dry weight
	marine water sediment
Value	1.4 mg/kg dry weight

8.2. Exposure controls

Engineering measures

Provide adequate ventilation.

Personal protective equipment

Respiratory protection

A respiratory protection program that meets OSHA 1910.134 and ANSI Z88.2 or applicable federal/provincial requirements must be followed whenever workplace conditions warrant respirator use. NIOSH's "Respirator Decision Logic" may be useful in determining the suitability of various types of respirators.

Hand protection

Glove material	for example, Polychloroprene (PCP)
Material thickness	0.5 mm
Break through time	>= 480 min
Glove material	for example, Fluorinated rubber (FKM)
Material thickness	0.4 mm
Break through time	>= 480 min
Method	Source: GESTIS substance database (hazardous substance information system of commercial professional associations)

Use impermeable gloves.
The above mentioned hand protection is based on knowledge of the chemistry and anticipated uses of this product but it may not be appropriate for all workplaces. A hazard assessment should be conducted prior to use to ensure suitability of gloves for specific work environments and processes prior to use.
Selection of protective gloves to meet the requirements of specific workplaces.
Suitability for specific workplaces should be clarified with protective glove manufacturers.

Eye protection
Use chemical splash goggles or face shield.

Skin and body protection
A safety shower and eye wash fountain should be readily available.
To identify additional Personal Protective Equipment (PPE) requirements, it is recommended that a hazard assessment in accordance with the OSHA PPE Standard (29CFR1910.132) be conducted before using this product.

Hygiene measures
Avoid contact with skin, eyes and clothing. Do not inhale vapors or aerosols. Do not eat, drink, or smoke when using the product. Remove contaminated or saturated clothing.

9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

physical state	liquid (20 °C)	(1013 hPa)
Colour	colorless	
Form	liquid	
Odour	solvent-like	
Odour Threshold	not determined	
pH	no data available	
Melting point/range	< -72 °C	(1013 hPa)
	Method:	OECD TG 102
Boiling point/range	ca. 186 °C	(1013 hPa)
	Method:	DIN 51 751
Flash point	63 °C	
	Method:	DIN EN ISO 2719 (Pensky-Martens, Closed Cup)
Evaporation rate	not determined	
Flammability (solid, gas)	not flammable	
	Method:	EEC method 92/69/EEC, A 12
Lower explosion limit	0.39 %(V)	(98 °C)

	Method: DIN 51649
Upper explosion limit	8.47 %(V) (150 °C) Method: DIN 51649
Vapour pressure	33 Pa (20 °C) Method: OECD Test Guideline 104 dynamic method 49 Pa (25 °C) Method: OECD Test Guideline 104 dynamic method
Vapour density	not determined
Relative density	0.88 (20 °C) Method: OECD Test Guideline 109
Density	ca. 0.88 g/cm3 (20 °C) Method: DIN 51757
Water solubility	Not miscible. Decomposition by hydrolysis.
Partition coefficient: n-octanol/water	log Pow: 2.033 (measured) log Pow: > 2.03 literature
Autoignition temperature	Not determined.
Thermal decomposition	not determined
Viscosity, dynamic	not determined
Viscosity, kinematic	1.4 mm2/s (20 °C) Method: QSAR

9.2. Other information

Explosiveness	Vapors can form explosive mixtures with air.
	% VOC (gm/l) 400
Metal corrosion	Not to be expected in view of the structure

10. Stability and reactivity

10.1. Reactivity

No dangerous reaction known under conditions of normal use.

10.2. Chemical stability

Stable under recommended storage conditions.

10.3. Possibility of hazardous reactions

10.4. Conditions to avoid
In the presence of oxygen and heat, the ethanol forming during the reaction may produce acetaldehyde.
Material may form acetaldehyde when heated with inorganic pigments in the presence of air.
Avoid high temperatures and sources of ignition.

10.5. Incompatible materials
Water

10.6. Hazardous decomposition products
Ethanol in case of hydrolysis

11. Toxicological information

11.1. Information on toxicological effects

Acute oral toxicity	LD50 Rat: > 5000 mg/kg Method: OECD Test Guideline 401
Acute inhalation toxicity	LC50 Rat: 5.88 mg/l / 4 h / dust/mist Method: OECD Test Guideline 403 Assessment: The substance or mixture has no acute inhalation toxicity
Acute dermal toxicity	LD50 Rat: > 2000 mg/kg Method: OECD Test Guideline 402 Assessment: The substance or mixture has no acute dermal toxicity
Skin irritation	Rabbit Skin irritation Method: OECD Test Guideline 404
Eye irritation	Rabbit No eye irritation Method: OECD Test Guideline 405
Sensitization	maximization test Guinea pig: Does not cause skin sensitisation. Method: OECD Test Guideline 406
Repeated dose toxicity	Oral Rat / 28-day NOAEL: > 1000 mg/kg Method: OECD Test Guideline 407
Assessment of STOT single exposure	Assessment: The substance or mixture is not classified as specific target organ toxicant, single exposure.
Assessment of STOT repeat exposure	Assessment: The substance or mixture is not classified as specific target organ toxicant, repeated exposure.
Risk of aspiration toxicity	No aspiration toxicity classification
Genotoxicity in vitro	Ames test Salmonella typhimurium

negative
Method: OECD TG 471

chromosomal aberration Chinese hamster (V 79 -cells)
negative
Method: OECD TG 473

chromosomal aberration Chinese hamster (CHO K1 -cells)
negative
Method: OECD TG 476

Gentoxicity in vivo: chromosomal aberration Mouse Oral
negative
Method: OECD TG 474

Carcinogenicity: No evidence that cancer may be caused.

carcinogenicity assessment: Contains no carcinogenic substances as defined by NTP, IARC and/or OSHA.

Toxicity to reproduction: Animal model trials have produced no evidence of fertility damage.

12. Ecological information

12.1. Toxicity

Toxicity to fish: LC50 Oncorhynchus mykiss: 85 mg/l / 96 h
Method: OECD 203
(literature value)

Toxicity in aquatic invertebrates: EC50 Daphnia magna: > 49.1 mg/l / 48 h
Method: OECD 202

Toxicity to algae: NOEC Desmodesmus subspicatus (green algae): >= 36 mg/l / 72 h
Method: OECD 201

Toxicity in terrestrial plants: EC50 Trifolium ornithopadioides: > 100 mg/kg / 17 d
Method: OECD 208

EC50 Lepidium sativum: > 100 mg/kg / 17 d
Method: OECD 208

EC50 Triticum aestivum: > 100 mg/kg / 17 d
Method: OECD 208

Toxicity in other terrestrial non-mammals: LC50 Eisenia foetida foetida: > 1000 mg/kg / 14 d
Method: OECD 207

12.2. Persistence and degradability

Biodegradability: Exposure time: 28 d
Result: 75 % Readily biodegradable.
Method: OECD 301 D

12.3. Bioaccumulative potential

Bioaccumulation: not bioaccumulative

12.4. Mobility in soil

Mobility: Adsorption on the floor: low.

12.5. Other adverse effects

Further Information: The data we have at our disposal do not necessitate identification concerning environmental hazard.

13. Disposal considerations

13.1. Waste treatment methods

Product

Waste must be disposed of in accordance with federal, provincial, state and local regulations. Empty containers must be handled with care due to product residue. DO NOT HEAT OR CUT THE EMPTY CONTAINER WITH AN ELECTRIC OR GAS TORCH.

Uncleaned packaging

Do not reuse empty containers and dispose of in accordance with the regulations issued by the appropriate local authorities.
If there is product residue in the emptied container, follow directions for handling on the container's label.
Incorrect disposal or reuse of this container is illegal and can be dangerous.
Other countries: observe the national regulations.

14. Transport information

D.O.T. Road/Rail

14.1.	UN number:	UN 1993
14.2.	UN proper shipping name:	Combustible liquid, n.o.s.(Triethoxyisobutylsilane)
14.3.	Transport hazard class(es):	C
14.4.	Packing group:	III
14.5.	Environmental hazards (Marine pollutant):	--
14.6.	Special precautions for user:	Yes

ROAD (CFR): Not regulated in packages 450 liter or less.
RAIL (CFR): Not regulated in packages 450 liter or less.

Air transport ICAO-TI/IATA-DGR

Not dangerous according to transport regulations.

14.1.	UN number:	--
14.2.	UN proper shipping name:	--

14.3. Transport hazard class(es): --
14.4. Packing group: --
14.5. Environmental hazards: --
14.6. Special precautions for user: Yes
IATA-C: Not hazardous freight in air traffic (ICAO-TI / IATA-DGR).
IATA-P: Not hazardous freight in air traffic (ICAO-TI / IATA-DGR).

Sea transport IMDG-Code/GGVSee (Germany)

Not dangerous according to transport regulations.

14.1. UN number: --
14.2. UN proper shipping name: --
14.3. Transport hazard class(es): --
14.4. Packing group: --
14.5. Environmental hazards (Marine pollutant): --

14.6. Special precautions for user: Yes
Not classified as hazardous sea cargo (IMDG code)
FOR USA ONLY: In packagings exceeding 450 L, this product must be classified, placarded, marked and shipped as Combustible Liquid to the USA.

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:
for transportapproval see regulatory information

15. Regulatory information

US Federal Regulations

OSHA

If listed below, chemical specific standards apply to the product or components:

- None listed

Clean Air Act Section (112)

If listed below, components present at or above the de minimus level are hazardous air pollutants:

- None listed

CERCLA Reportable Quantities

If listed below, a reportable quantity (RQ) applies to the product based on the percent of the named component:

- None listed

SARA Title III Section 311/312 Hazard Categories

The product meets the criteria only for the listed hazard classes:

- Acute Health Hazard
- Fire Hazard

SARA Title III Section 313 Reportable Substances

If listed below, components are 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:

- None listed

Toxic Substances Control Act (TSCA)

If listed below, non-proprietary substances are subject to export notification under Section 12 (b) of TSCA:

- None listed

State Regulations

The Listing requirements of the Right to Know (RTK) legislation varies by state. All information for NJ, PA, MA and other states can be derived from the listing of hazardous and non-hazardous components in section 2 and 15 of this MSDS.

California Proposition 65

A warning under the California Drinking Water Act is required only if listed below:

- None listed

An employer using HMIS/NFPA labeling must through training ensure that its employees are fully aware of the hazards of the chemicals used.

HMIS Ratings

Health :	2
Flammability :	2
Physical Hazard :	1

NFPA Ratings

Health :	2
Flammability :	2
Reactivity :	1

16. Other information

Further information

Revision date 04/21/2015

Changes since the last version are highlighted in the margin. This version replaces all previous versions.

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Legend

ACC	American Chemistry Council
ACGIH	American Conference of Governmental Industrial Hygenists
ACS	Advisory Committee on Sustainability
ADI	Acceptable Daily Intake
ASTM	American Society for Testing and Materials
ATP	Adaptation to Technical Progress
BCF	Bioconcentration factor
BOD	Biochemical oxygen demand
c.c.	closed cup
CAO	Cargo Aircraft Only
Carc	Carcinogen
CAS	Chemical Abstract Services
CDN	Canada
CEPA	Canadian Environmental Protection Act
CERCLA	Comprehensive Environmental Response – Compensation and Liability Act
CFR	Code of Federal Regulations
CMR	carcinogenic-mutagenic-toxic for reproduction
COD	Chemical oxygen demand
DIN	German Institute for Standardization
DMEL	Derived minimum effect level
DNEL	Derived no effect level
DOT	Department of Transportation
EC50	half maximal effective concentration
EPA	Environmental Protection Agency
ErC50	Reduction of Growth Rate
ERG	Emergency Response Guide Book
FDA	Food and Drug Administration
GHS	Globally Harmonized System of Classification and Labelling of Chemicals (GHS)
GLP	Good Laboratory Practice
GMO	Genetic Modified Organism
HCS	Hazard Communication Standard
HMIS	Hazardous Materials Identification System
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IBC	Intermediate Bulk Container
ICAO-TI	International Civil Aviation Organization- Technical Instructions
ICCA	International Council of Chemical Association
ID	Identification number
IMDG	International Maritime Dangerous Goods
IUPAC	International Union of Pure and Applied Chemistry
ISO	International Organization For Standardization
LC50	50 % Lethal Concentration
LD50	50 % Lethal Dose
L(E)C50	LC50 or EC50
LOAEL	Lowest observed adverse effect level
LOEL	Lowest observed effect level
MARPOL	International Convention for the Prevention of Pollution from Ships
NFPA	National Fire Protection Association
NOAEL	No observed adverse effect level
NOEC	no observed effect concentration
NOEL	no observed effect level
o. c.	open cup
OECD	Organisation for Economic Cooperation and Development
OEL	Occupational Exposure Limit
OSHA	Occupational Safety and Health Administration
PBT	Persistent, bioaccumulative, toxic
PEC	Predicted effect concentration
PNEC	Predicted no effect concentration
RQ	Reportable Quantity
SDS	Safety Data Sheet
STOT	Specific Target Organ Toxicity
UN	United Nations
vPvB	very persistent, very bioaccumulative

voc	volatile organic compounds
WHMIS	Workplace Hazardous Materials Information System
WHO	World Health Organization