

LUPEROX® 101 E

1. PRODUCT AND COMPANY IDENTIFICATION**Company**

Arkema Inc.
900 First Avenue
King of Prussia, Pennsylvania 19406

Functional Additives

Customer Service Telephone Number: (800) 331-7654
(Monday through Friday, 8:00 AM to 5:00 PM EST)

Emergency Information

Transportation: CHEMTREC: (800) 424-9300
(24 hrs., 7 days a week)
Medical: Rocky Mountain Poison Center: (866) 767-5089
(24 hrs., 7 days a week)

Product Information

Product name: LUPEROX® 101 E
Synonyms: Not available
Molecular formula: C16 H34 O4
Chemical family: Organic peroxide - dialkyl peroxides
Molecular weight: 290.45 g/mol
Product use: initiator/catalyst

SECTION 2: HAZARDS IDENTIFICATION**Emergency Overview**

Color: colourless
Physical state: liquid
Odor: ether-like

***Classification of the substance or mixture:**

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)
Flammable liquids, Category 4, H227
Organic peroxides, Type C, H242
Skin irritation, Category 2, H315
Eye irritation, Category 2A, H319
Chronic aquatic toxicity, Category 3, H412

*For the full text of the H-Statements mentioned in this Section, see Section 16.

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GHS-Labeling

Hazard pictograms:



Signal word:

Danger**Hazard statements:**

H227 : Combustible liquid.

H242 : Heating may cause a fire.

H315 : Causes skin irritation.

H319 : Causes serious eye irritation.

H412 : Harmful to aquatic life with long lasting effects.

Supplemental Hazard Statements:

Organic peroxide.

Hazardous decomposition may occur.

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Precautionary statements:**Prevention:**

P210 : Keep away from heat/sparks/open flames/hot surfaces. No smoking.
 P220 : Keep/Store away from clothing/ combustible materials.
 P234 : Keep only in original container.
 P264 : Wash skin thoroughly after handling.
 P273 : Avoid release to the environment.
 P280 : Wear protective gloves or eye protection or face protection.

Response:

P302 + P352 : IF ON SKIN: Wash with plenty of soap and water.
 P305 + P351 + P338 : IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P332 + P313 : If skin irritation occurs: Get medical advice/ attention.
 P337 + P313 : If eye irritation persists: Get medical advice/ attention.
 P362 : Take off contaminated clothing and wash before reuse.
 P370 + P378 : In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.

Storage:

P410 : Protect from sunlight.
 P411 + P235 : Maximum storage temperature is specified on label and in section 7 of SDS. Keep cool.
 P420 : Store away from other materials.

Disposal:

P501 : Dispose of contents or container to an approved waste disposal plant.

Supplemental information:**Potential Health Effects:**

If swallowed, may cause severe irritation and injury to the mouth, throat and digestive tract.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Chemical name	CAS-No.	Wt/Wt	GHS Classification**
Peroxide, (1,1,4,4-tetramethyl-1,4-butanediyl)bis[(1,1-dimethylethyl)	78-63-7	<= 100 %	H227, H242, H315

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1,2-Dioxane, 3,3,6,6-tetramethyl-	22431-89-6	<= 5 %	H242, H226, H335, H319, H315
2,4,4-Trimethylpentene	25167-70-8	<= 2 %	H225, H336, H304, H400, H410
Hydroperoxide, 4-[(1,1-dimethylethyl)dioxy]-1,1,4-trimethylpentyl	23661-84-9	1 %	H314, H318

**For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: FIRST AID MEASURES

4.1. Description of necessary first-aid measures:

Inhalation:

If inhaled, remove victim to fresh air.

Skin:

In case of contact, immediately flush skin with plenty of water. Get medical attention. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eyes:

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.

Ingestion:

If swallowed, DO NOT induce vomiting. Get medical attention. Never give anything by mouth to an unconscious person.

4.2. Most important symptoms/effects, acute and delayed:

For most important symptoms and effects (acute and delayed), see Section 2 (Hazard Statements and Supplemental Information if applicable) and Section 11 (Toxicology Information) of this SDS.

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

Unless otherwise noted in Notes to Physician, no specific treatment noted; treat symptomatically.

SECTION 5: FIREFIGHTING MEASURES

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Extinguishing media (suitable):

Water spray, Foam, Dry chemical, Carbon dioxide (CO2)

Extinguishing media (unsuitable):

Water may be ineffective., Do not use a solid water stream as it may scatter and spread fire.

Protective equipment:

Fire fighters and others who may be exposed to products of combustion should wear full fire fighting turn out gear (full Bunker Gear) and self-contained breathing apparatus (pressure demand / NIOSH approved or equivalent).

Further firefighting advice:

Fight fire with large amounts of water from a safe distance.

Cool closed containers exposed to fire with water spray.

Closed containers of this material may explode when subjected to heat from surrounding fire.

After a fire, wait until the material has cooled to room temperature before initiating clean-up activities.

Do not allow run-off from fire fighting to enter drains or water courses.

Fire fighting equipment should be thoroughly decontaminated after use.

Fire and explosion hazards:

Contact with materials to avoid or exposure to temperatures exceeding the SADT may result in a self-accelerating decomposition reaction with release of flammable vapors which may autoignite.

When burned, the following hazardous products of combustion can occur:

Carbon oxides

Hazardous organic compounds

6. ACCIDENTAL RELEASE MEASURES**Personal precautions, Emergency procedures, Methods and materials for containment/clean-up:**

Prevent further leakage or spillage if you can do so without risk. Evacuate area of all unnecessary personnel. Ventilate the area. Eliminate all ignition sources. Avoid generation of vapors. Contain and collect spillage with non-combustible absorbent material such as sodium bicarbonate, sodium carbonate, calcium carbonate, clean sand or non-acidic clay and then wet down (dampen) the mixture with water. DO NOT USE peat moss. Sweep or scoop up using non-sparking tools and place into suitable properly labeled containers for prompt disposal. The sweepings should be wetted down further with water. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Consult a regulatory specialist to determine appropriate state or local reporting requirements, for assistance in waste characterization and/or hazardous waste disposal and other requirements listed in pertinent environmental permits.

Protective equipment:

Appropriate personal protective equipment is set forth in Section 8.

SECTION 7: HANDLING AND STORAGE**Handling****General information on handling:**

Contact with materials to avoid or exposure to temperatures exceeding the SADT may result in a self-accelerating decomposition reaction with release of flammable vapors which may autoignite.

Avoid contact with skin, eyes and clothing.

Avoid breathing vapor or mist.

Keep away from heat, sparks and flames.

No smoking.

Use only with adequate ventilation.

Wash thoroughly after handling.

Prevent product contamination.

Keep container tightly closed and away from combustible materials.

Keep only in the original container.

Check that all equipment is properly grounded and installed to satisfy electrical classification requirements.

Container hazardous when empty.

Follow label warnings even after container is emptied.

RESIDUAL VAPORS MAY EXPLODE ON IGNITION.

DO NOT CUT, DRILL, GRIND, OR WELD ON OR NEAR THIS CONTAINER.

Do not reuse container as it may retain hazardous product residue.

Improper disposal or reuse of this container may be dangerous and/or illegal.

Emptied container retains vapor and product residue.

Storage**General information on storage conditions:**

Keep container closed when not in use. Store in closed containers, in a secure area to prevent container damage and subsequent spillage. Store in upright position only. Segregated or detached storage is preferred. Store in well ventilated area away from heat and sources of ignition such as flame, sparks and static electricity. Ensure that all storage and handling equipment is properly grounded and installed to satisfy electrical classification requirements. Store out of direct sunlight in a cool well-ventilated place. Store in original container. Store away from combustibles and materials to avoid. Refer also to National Fire Protection Association (NFPA) Code 400, Hazardous Materials Code. Static electricity may accumulate when transferring material. All metal and groundable storage containers, including but not limited to drums, cylinders, Returnable Intermodal Bulk Containers (RIBCs) and Class C Flexible Intermodal Bulk Containers (FIBCs) must be bonded and grounded during filling and emptying operations. Observe all federal, state and local regulations and National Fire Protection Association (NFPA) Codes which pertain to the specific local conditions of storage and use, including OSHA 29 CFR 1910.106 and NFPA 30, 70, 77, and 497.

Storage stability – Remarks:

Follow the recommended storage temperatures provided in this Section in order to maintain stability and oxygen content.

Storage incompatibility – General:

Store away from excessive heat, sources of ignition, and reactive materials.

Store separate from:

Strong acids

Strong oxidizing agents

Reducing agents

Accelerators

Amines

Friedel - Crafts reaction catalyst

Brass

Copper

Iron

For all Organic Peroxides, compatible materials of contact are stainless steel 304 or 316 (preferred), high-density polyethylene (HDPE), polytetrafluoroethylene or glass linings.

Temperature tolerance – Do not store below:

50 °F (10 °C)

Temperature tolerance – Do not store above:

100 °F (38 °C)

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Airborne Exposure Guidelines:

Engineering controls:

Investigate engineering techniques to reduce exposures below airborne exposure limits or to otherwise reduce exposures. Provide ventilation if necessary to minimize exposures or to control exposure levels to below airborne exposure limits (if applicable see above). If practical, use local mechanical exhaust ventilation at sources of air contamination such as open process equipment.

Consult ACGIH ventilation manual or NFPA Standard 91 for design of exhaust systems.

Respiratory protection:

Avoid breathing vapor or mist. Where airborne exposure is likely or airborne exposure limits are exceeded (if applicable, see above), use NIOSH approved respiratory protection equipment appropriate to the material and/or its components. Full facepiece equipment is recommended and, if used, replaces need for face shield and/or chemical goggles. Consult respirator manufacturer to determine appropriate type equipment for a given application. Observe respirator use limitations specified by NIOSH or the manufacturer. For emergency and other conditions where there may be a potential for significant exposure or where exposure limit may be significantly exceeded, use an approved full face positive-pressure, self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply. Respiratory protection programs must comply with 29 CFR § 1910.134.

Skin protection:

Wear appropriate chemical resistant protective clothing and chemical resistant gloves to prevent skin contact. Consult glove manufacturer to determine appropriate type glove material for given application. Wear face shield and chemical resistant clothing such as a rubber apron when splashing may occur. Rinse immediately if skin is contaminated. Remove contaminated clothing immediately and wash before reuse. Clean protective equipment before reuse. Wash thoroughly after handling.

Eye protection:

Where there is potential for eye contact, wear chemical goggles and have eye flushing equipment immediately available.

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SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Color:	colourless
Physical state:	liquid
Odor:	ether-like
Odor threshold:	No data available
Flash point	154 °F (68 °C) (ISO 3679)(Method: A9 Method (D. 92/69/ECC))
Auto-ignition temperature:	No data available.
Lower flammable limit (LFL):	No data available
Upper flammable limit (UFL):	No data available
pH:	No data available
Density:	872 kg/m ³ (68 °F (20 °C)) (Method: A3 method)
Specific Gravity (Relative density):	No data available
Relative vapor density:	10 (Air = 1.0)
Boiling point/boiling range:	Decomposes before boiling. Rate of decomposition increases with rising temperature.
Melting point/range:	46 °F (8 °C)(Method: OECD Test Guideline 102)
Freezing point:	No data available.
Evaporation rate:	No data available
Solubility in water:	0.152 mg/l 68 °F (20 °C) (Method: OECD Test Guideline 105)
Solubility in other solvents: [qualitative and quantitative]	Soluble in most organic solvents
Viscosity, dynamic:	No data available
Molecular weight:	290.45 g/mol
Oil/water partition coefficient:	No data available.

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Self-Accelerating Decomposition Temperature (SADT):	176 °F (80 °C) (Method: Rapid heat test)
Thermal decomposition:	No data available
Active oxygen content:	10 %
Flammability:	See GHS Classification in Section 2 if applicable

SECTION 10: STABILITY AND REACTIVITY**Stability:**

This material is chemically unstable and should only be handled under specified conditions. See HANDLING AND STORAGE section of this MSDS for specified conditions.

Hazardous reactions:

Hazardous polymerization does not occur.

Materials to avoid:

Strong acids
Strong oxidizing agents
Reducing agents
Accelerators
Friedel - Crafts reaction catalyst
Brass
Copper
Iron

For all Organic Peroxides, compatible materials of contact are stainless steel 304 or 316 (preferred), high-density polyethylene (HDPE), polytetrafluoroethylene or glass linings.

Conditions / hazards to avoid:

See HANDLING AND STORAGE section of this MSDS for specified conditions. SADT - Self Accelerating Decomposition Temperature. Lowest temperature at which the tested package size will undergo a self-accelerating decomposition reaction. This reaction will generate flammable vapors which may autoignite. The length of time to generate a decomposition reaction, after the SADT has been reached or exceeded, is dependent upon how much the SADT has been exceeded and the length of time needed for the reaction exotherm (heat spike from increasing decomposition rate) to initiate a rapid decomposition reaction. Typically, SADT is inversely proportional to package size. Larger packages will have a lower SADT due to smaller ratio to heat transfer area to volume of product.

Hazardous decomposition products:

Temperatures at or above SADT can result in the release of hazardous decomposition products which are flammable and may autoignite.

Thermal decomposition giving flammable and toxic products :

Carbon oxides
Hazardous organic compounds

SECTION 11: TOXICOLOGICAL INFORMATION

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Data on this material and/or its components are summarized below.

Data for LUPEROX® 101 E**Acute toxicity****Dermal:**

Acute toxicity estimate 4,100 mg/kg.

Data for Peroxide, (1,1,4,4-tetramethyl-1,4-butanediyl)bis[(1,1-dimethylethyl) (78-63-7)**Acute toxicity****Oral:**

No deaths occurred. (rat) LD0 > 2,000 mg/kg.

Dermal:

May be harmful in contact with skin. (rabbit) LD50 = 4,100 mg/kg.

Skin Irritation:

Causes skin irritation. (rabbit) (4 h)

Eye Irritation:

Causes mild eye irritation. (rabbit)

Skin Sensitization:

Not a sensitizer. Guinea pig maximization test. No skin allergy was observed

Repeated dose toxicity

Subchronic oral administration to rat / affected organ(s): kidney / signs: hyaline droplet nephropathy

Repeated oral administration to rat / affected organ(s): liver, kidney / signs: changes in organ weights, changes in organ structure or function, hyaline droplet nephropathy

Genotoxicity**Assessment in Vitro:**

No genetic changes were observed in laboratory tests using: bacteria, animal cells

Genotoxicity**Assessment in Vivo:**

No genetic changes were observed in a laboratory test using: mice

Developmental toxicity

Exposure during pregnancy. oral (rat) / No birth defects were observed.

Data for 1,2-Dioxane, 3,3,6,6-tetramethyl- (22431-89-6)**Acute toxicity**

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Oral:

signs: According to its structure :, Slightly harmful by ingestion

Specific target organ toxicity - single exposure:

May cause respiratory irritation.

Skin Irritation:

Causes skin irritation. (estimate based on composition)

Eye Irritation:

Causes serious eye irritation. (estimate based on composition)

Other information

The information presented is from representative materials in this chemical class. The results may vary depending on the test substance.

Data for 2,4,4-Trimethylpentene (25167-70-8)**Acute toxicity****Oral:**

No deaths occurred. (rat) LD0 = 2,000 mg/kg.

Dermal:

No deaths occurred. (rat) LD0 = 2,000 mg/kg.

Inhalation:

No deaths occurred. (rat) 4 h LCO = 19.17 mg/l. (vapor)

Specific target organ toxicity - single exposure:

May cause drowsiness or dizziness.

Skin Irritation:

Causes mild skin irritation. (rabbit) (4 h)

Eye Irritation:

Causes mild eye irritation. (rabbit)

Skin Sensitization:

Not a sensitizer. Guinea pig maximization test. Skin allergy was observed. (Weak response)

Repeated dose toxicity

Repeated oral administration to rat / affected organ(s): kidney, liver / signs: increased organ weight / No significant impairment of function.

Genotoxicity**Assessment in Vitro:**

No genetic changes were observed in laboratory tests using: bacteria, animal cells, human cells

Genotoxicity

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Assessment in Vivo:

No genetic changes were observed in laboratory tests using: rat

Developmental toxicity

Reproductive/Developmental Effects Screening Assay. Oral (rat) / No birth defects were observed.

Reproductive effects

Reproductive/Developmental Effects Screening Assay. Oral (rat) / No toxicity to reproduction.

Human experience**General:**

Central nervous system effects: headache, nausea, dizziness, drowsiness, loss of consciousness.

Human experience**Inhalation:**

Upper respiratory tract: irritating, sore throat.

Data for Hydroperoxide, 4-[(1,1-dimethylethyl)dioxy]-1,1,4-trimethylpentyl (23661-84-9)**Acute toxicity****Skin Irritation:**

Causes severe skin burns. (rabbit) (estimate based on composition)

Eye Irritation:

Causes serious eye damage. (rabbit) (estimate based on composition)

SECTION 12: ECOLOGICAL INFORMATION**Chemical Fate and Pathway**

Data on this material and/or its components are summarized below.

Data for Peroxide, (1,1,4,4-tetramethyl-1,4-butanediyl)bis[(1,1-dimethylethyl) (78-63-7)**Stability in water:**

Half-life 2.7 h (@pH 4)

Half-life 2.7 h (@pH 7)

Half-life 2.8 h (@pH 9)

Biodegradation:

Not readily biodegradable. (60 d) biodegradation 0 %

Bioaccumulation:

512 - 539 (Fish)

Octanol Water Partition Coefficient:

log Pow: = 7.34, at 68 °F (20 °C)

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Data for 2,4,4-Trimethylpentene (25167-70-8)**Biodegradation:**

Not readily biodegradable. (28 d) biodegradation 1.6 %

Octanol Water Partition Coefficient:

log Pow: = 4.9, at 77 °F (25 °C) pH = 7

Ecotoxicology

Data on this material and/or its components are summarized below.

Data for Peroxide, (1,1,4,4-tetramethyl-1,4-butanediyl)bis[(1,1-dimethylethyl) (78-63-7)**Aquatic toxicity data:**

No effect up to the limit of solubility. *Oryzias latipes* (Orange-red killifish) 96 h

Algae:

No effect up to the limit of solubility. *Pseudokirchneriella subcapitata* 72 h

Microorganisms:

Activated sludge 3 h NOEC (Respiration inhibition) > 1,000 mg/l

Chronic toxicity to aquatic invertebrates:

No effect up to the limit of solubility. *Daphnia magna* (Water flea) 21 d NOEC > 0.0065 mg/l

Chronic toxicity to aquatic plants:

No effect up to the limit of solubility. *Pseudokirchneriella subcapitata* 72 h NOEC > 0.236 mg/l

Data for 2,4,4-Trimethylpentene (25167-70-8)**Aquatic toxicity data:**

Very toxic. *Oncorhynchus mykiss* (rainbow trout) 96 h LC50 = 0.58 mg/l

Aquatic invertebrates:

Toxic. *Daphnia magna* (Water flea) 48 h EC50 = 1.2 mg/l

Algae:

Toxic. *Pseudokirchneriella subcapitata* (green algae) 72 h ErC50 = 1.5 mg/l

Microorganisms:

Pseudomonas fluorescens 28 d NOEC = 23 mg/l

Chronic toxicity to aquatic invertebrates:

Toxic. *Daphnia magna* (Water flea) 21 d NOEC (Reproduction inhibition) = 0.16 mg/l

SECTION 13: DISPOSAL CONSIDERATIONS**Waste disposal:**

Dilution followed by incineration is the preferred method. Dilution ratio of 10:1 in a clean, compatible, combustible solvent (i.e., Fuel Oil #2, mineral oil) will reduce reactivity hazard during incineration and transportation. Dispose of in accordance with federal, state and local regulations. Consult a regulatory specialist to determine appropriate state

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or local reporting requirements, for assistance in waste characterization and/or hazardous waste disposal and other requirements listed in pertinent environmental permits. Note: Chemical additions to, processing of, or otherwise altering this material may make this waste management information incomplete, inaccurate, or otherwise inappropriate. Furthermore, state and local waste disposal requirements may be more restrictive or otherwise different from federal laws and regulations.

Take appropriate measures to prevent release to the environment.

SECTION 14: TRANSPORT INFORMATION

US Department of Transportation (DOT)

UN Number : 3103
Proper shipping name : Organic peroxide type C, liquid
Technical name : (2,5-Dimethyl-2,5-di(tert-butylperoxy) hexane, 90-100%)
Class : 5.2
Marine pollutant : no

International Maritime Dangerous Goods Code (IMDG)

UN Number : 3103
Proper shipping name : ORGANIC PEROXIDE TYPE C, LIQUID
Technical name : (2,5-DIMETHYL-2,5-DI(TERT-BUTYLPEROXY) HEXANE, 90-100%)
Class : 5.2
Marine pollutant : no
Flash point : 154 °F (68 °C) ISO 3679

SECTION 15: REGULATORY INFORMATION

Chemical Inventory Status

US. Toxic Substances Control Act	TSCA	The components of this product are all on the Active TSCA Inventory.
Canadian Domestic Substances List (DSL)	DSL	All components of this product are on the Canadian DSL
China. Inventory of Existing Chemical Substances in China (IECSC)	IECSC (CN)	All components of this product are listed or exempted
Japan. ENCS - Existing and New Chemical Substances Inventory	ENCS (JP)	Not all components of this product are listed or exempted
Japan. ISHL - Inventory of Chemical Substances	ISHL (JP)	All components of this product are listed or exempted
Korea. Korean Existing Chemicals Inventory (KECI)	KECI (KR)	All components of this product are listed or exempted

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Philippines Inventory of Chemicals and Chemical Substances (PICCS)	PICCS (PH)	All components of this product are listed or exempted
Australian Inventory of Industrial Chemicals	AU AIICL	All components of this product are listed or exempted
Taiwan Chemical Substance Inventory (TCSI)	TCSI	All components of this product are listed or exempted

United States – Federal Regulations

SARA Title III – Section 302 Extremely Hazardous Chemicals:

The components in this product are either not SARA Section 302 regulated or regulated but present in negligible concentrations.

SARA Title III - Section 311/312 Hazard Categories:

Fire Hazard, Acute Health Hazard, Reactivity Hazard

SARA Title III – Section 313 Toxic Chemicals:

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.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) - Reportable Quantity (RQ):

The components in this product are either not CERCLA regulated, regulated but present in negligible concentrations, or regulated with no assigned reportable quantity.

United States – State Regulations

California Prop. 65

This product does not contain any chemicals known to the State of California to cause cancer, birth defects, or any other reproductive defects.

SECTION 16: OTHER INFORMATION

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Full text of H-Statements referred to under sections 2 and 3.

- H225 Highly flammable liquid and vapour.
- H226 Flammable liquid and vapour.
- H227 Combustible liquid.
- H242 Heating may cause a fire.
- H304 May be fatal if swallowed and enters airways.
- H314 Causes severe skin burns and eye damage.
- H315 Causes skin irritation.
- H318 Causes serious eye damage.
- H319 Causes serious eye irritation.
- H335 May cause respiratory irritation.
- H336 May cause drowsiness or dizziness.
- H400 Very toxic to aquatic life.
- H410 Very toxic to aquatic life with long lasting effects.
- H412 Harmful to aquatic life with long lasting effects.

Miscellaneous:

Other information: Refer to National Fire Protection Association (NFPA) Codes 30, 70, 77, and 497 and OSHA 29 CFR 1910.106, for safe handling.

Latest Revision(s):

Reference number: 200008328
Date of Revision: 06/28/2023
Date Printed: 06/28/2023

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