

Trigonox 101

1. CHEMICAL PRODUCT AND COMPANY INFORMATION

Product name Trigonox 101	Chemical description 2,5-Dimethyl-2,5-di-(tert-butylperoxy)hexane
Synonym(s) Peroxide, (1,1,4,4-tetramethyl-1,4-butane-diyl)bis{(1,1-dimethylethyl)}	Chemical formula C16 H34 O4
CAS number 78-63-7	Chemical family Organic peroxides/dialkyl peroxides
Supplier Akzo Nobel Polymer Chemicals LLC 525 West Van Buren Street Chicago, IL 60607-3823 USA	
Medical/Handling Emergency + 1-914-693-6946 Dobbs Ferry, NY USA	Transportation Emergency CHEMTREC - USA: 1-800-424-9300 CANUTEC - CANADA: 1-613-996-6666
Product use Polymerization initiator	Product/technical information 1-800-828-7929
Date of first issue 1994-03-31	Date of last issue / Revision 2004-01-29 / 7.00

2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients	Percentage(s)	CAS number
2,5-Dimethyl-2,5-di-(tert-butylperoxy)hexane	92.00 - 98.00	78-63-7
Di-tert-butyl peroxide	0.01 - 1.00	110-05-4
2,4,4-trimethyl-1-pentene	0.01 - 0.40	107-39-1
2,5-Dimethyl-2,5-dihydroperoxyhexane	0.01 - 0.30	3025-88-5

3. HAZARDS IDENTIFICATION

<p>Emergency overview Clear, light-yellow liquid with a faint odor. DANGER! ORGANIC PEROXIDE. HEAT OR CONTAMINATION MAY CAUSE HAZARDOUS DECOMPOSITION. COMBUSTIBLE LIQUID AND VAPOR. CAUSES SKIN IRRITATION. MAY CAUSES EYE AND RESPIRATORY TRACT IRRITATION. Peroxides and peroxide decomposition products are flammable and can ignite with explosive force if confined.</p>
<p>Health effects Skin or eye contact and inhalation of vapor or mists are the principal routes of exposure to this product. Inhalation of fumes or vapors may be irritating to the upper respiratory system. Skin contact can cause severe irritation with redness and edema. Eye contact may cause irritation. If swallowed, this product may cause severe irritation of the mouth, throat, and stomach.</p>

Carcinogenicity	
Description	Applicable

MARKETED BY
HARWICK STANDARD
DISTRIBUTION CORPORATION
60 S. Selberling Street • Akron, Ohio 44305

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IARC	no
NTP	no
OSHA	no
ACGIH	no

4. FIRST AID MEASURES

Inhalation

Remove to fresh air. If breathing becomes difficult, oxygen may be given, preferably with a physician's advice. If not breathing, give artificial respiration. Get medical attention.

Skin

Immediately remove contaminated clothing and shoes. Wash skin with soap and plenty of water for at least 15 minutes. Do not attempt to neutralize with chemical agents. Get medical attention. Wash contaminated clothing before reuse. Thoroughly clean or destroy contaminated shoes.

Eye

Immediately flush eyes with large quantities of running water for a minimum of 15 minutes. If the victim is wearing contact lenses, remove them. Take care not to contaminate the victim's healthy skin and eyes. Hold the eyelids apart during the flushing to ensure rinsing of the entire surface of the eye and lids. DO NOT let victim rub eye(s). Do not attempt to neutralize with chemical agents. Get medical attention immediately. Oils or ointments should not be used at this time. Continue flushing for an additional 15 minutes if a physician is not immediately available.

Ingestion

Immediately give several glasses of water. DO NOT induce vomiting. If vomiting occurs, keep head below hips to reduce the risk of aspiration. Give fluids again. Have a physician determine if condition of patient will permit induction of vomiting or evacuation of stomach. Never give anything by mouth to a person who is unconscious or convulsing.

If victim is unconscious, monitor pulse, breathing and airway. If breathing stops, begin artificial respiration immediately. If the heart has stopped, give cardiopulmonary resuscitation (CPR). Get medical attention immediately.

Note to physician

Persons with pre-existing skin disease may be at an increased risk if exposed dermally to this material.

No specific antidote is known. Based on the individual reactions of the patient, the physician's judgement should be used to control symptoms and clinical conditions.

5. FIRE-FIGHTING MEASURES

Flash point 149.00 °F 65.00 °C	Autoignition temperature not determined
Flash Method Tag Closed Cup	Explosion limits lower: N/D upper: N/D

Extinguishing media

Use water fog, dry chemical, carbon dioxide, or foam extinguishing agents. Extinguish large fires with large amounts of water spray, fog or foam from a safe/protected position.

Fire fighting procedures

As in any fire, prevent human exposure to fire, smoke, fumes or products of combustion. Evacuate non-essential personnel from the fire area. Firefighters should wear full-face, self-contained breathing apparatus and impervious protective clothing. If possible, move containers from the fire area. If not leaking, keep fire exposed containers cool with a water fog or spray to prevent rupture due to excessive heat. High pressure water may spread product from broken containers increasing contamination or fire hazard. Dike fire control water for later disposal. Do not allow contaminated water to enter waterways.

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Fire and explosion hazard

Peroxides and peroxide decomposition products are flammable and can ignite with explosive force if confined. This product can produce flammable vapors which may travel to a source of ignition and flash back.

Hazardous products of combustion

Thermal decomposition produces oxides of carbon and/or hazardous fumes, vapors and/or gasses.

NFPA ratings

Hazard	Rating
Health	2
Flammability	3
Reactivity	2
Other	ND

6. ACCIDENTAL RELEASE MEASURES

Methods for cleaning up

Remove all sources of ignition from the spill area. Stop source of spill. If tools are needed, they should be non-sparking. Dike area to prevent spill from spreading.

Evacuate all non-essential personnel upwind. Any person entering an area of a significant spill or of an unknown concentration of a gas or a vapor should use a NIOSH-approved, positive-pressure/pressure-demand, self-contained breathing apparatus. Protective equipment to prevent skin and eye contact should be worn.

Soak up spilled material with a suitable absorbent such as clay, sand or earth. Sweep up absorbed material and place in a chemical waste container for disposal.

7. HANDLING AND STORAGE

Handling

Containers should be located in an area where they can be rotated regularly (first in, first out) and visually inspected for damage or bulging on a regular basis.

Use approved equipment for transport of containers to avoid puncturing or rupturing containers. Do not use air pressure to empty containers.

Protective equipment should be worn when handling this product to avoid eye and skin contact.

Emptied container may retain product residues. Follow all warnings and precautions even after container is emptied.

Storage

To insure product quality, storage temperatures should not exceed 104 F (40 C). To insure against possible exothermic self-accelerating decomposition, storage temperatures must not exceed 167 F (75 C). This emergency temperature is derived from the SADT (see Sect. 9). Keep containers tightly closed. Store away from reducing agents (e.g. amines, acids, alkalis) and heavy metal compounds (e.g. driers metal soaps and accelerators).

Maximum storage temperature

104.00 °F 40.00 °C

General comments

Containers should not be opened until ready for use. Use clean non-sparking equipment and tools when handling.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Respiratory protection

Use a NIOSH-approved organic vapor respirator with dust, mist and fume filters to reduce potential for inhalation exposure if use conditions generate vapor, mist or aerosol and adequate ventilation (e.g., outdoor or well-ventilated area) is not available. Where exposure potential necessitates a higher level of protection, use a NIOSH-approved, positive-pressure/pressure-demand, air-supplied respirator.

When using respirator cartridges or canisters, they must be changed frequently (following each use or at the end of the workshift) to assure breakthrough exposure does not occur.

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<p>Skin protection Skin contact with this product should be prevented through the use of suitable protective clothing, gloves, and footwear selected with regard for use condition exposure potential.</p>
<p>Eye protection Because eye contact with this product may cause irritation, chemical goggles and/or a face shield should be worn when handling this product.</p>
<p>ventilation protection Local exhaust ventilation, enclosed system design, continuous monitoring devices, process isolation and remote control are traditional exposure control techniques which may be used to effectively minimize employee exposure.</p>
<p>Other information Safety showers, with quick opening valves which stay open, and eye wash fountains, or other means of washing the eyes with a gentle flow of cool to tepid tap water, should be readily available in all areas where this material is handled or stored. Water should be supplied through insulated and heat-traced lines to prevent freezeups in cold weather.</p>
<p>Applicable exposure limits Other than any exposure limits which may be displayed in Section 8, there are no other known exposure limits applicable to this product or its components.</p>

Agency	Value/Unit of measurement
2,4,4-trimethyl-1-pentene	
AIHA WEEL/TWA	344.000 mg/m ³
<small> PEL = Permissible Exposure Limit TLV = Threshold Limit Value TWA = Time Weighted Average STEL = Short Term Exposure Limit CEIL = Ceiling Exposure Limit REL = Recommended Exposure Limit WEEL = Workplace Environmental Exposure Limit IDLH = Immediate Dangerous to Life and Health </small>	

9. PHYSICAL AND CHEMICAL PROPERTIES

<p>Appearance and Odor Clear, light-yellow liquid with a faint odor.</p>	<p>pH value not determined</p>
<p>Odor threshold (ppm) not determined</p>	<p>Relative vapor density (air=1) not determined</p>
<p>Volatile % not determined</p>	<p>Vapor pressure (mm Hg) not determined</p>
<p>Boiling point/range not determined</p>	<p>Evaporation rate not determined</p>
<p>Melting point/range 46.40 °F 8.00 °C</p>	
<p>Cloud point not determined</p>	<p>Pour point not determined</p>
<p>Flash point 149.00 °F 65.00 °C</p>	<p>Solubility in water Insoluble</p>
<p>Flash method Tag Closed Cup</p>	<p>Solubility in other solvents not determined</p>
<p>Autoignition temperature not determined</p>	

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Specific Gravity/Density .865 @ 25 deg C (77 deg F)	Partition coefficient n-octanol/water not determined
Bulk density not determined	
Other information SADT = 176 F (80 C) (See Sect. 10).	Explosion limits lower: N/D upper: N/D

10. STABILITY AND REACTIVITY

Stability This product is stable at ambient temperatures but may decompose if exposed to temperatures above 167 F (75 C).
Incompatibilities This product is incompatible with strong acids, strong alkalis, reducing agents and accelerators.
Polymerization Hazardous polymerization will not occur.
Decomposition Thermal decomposition will produce oxides of carbon and can produce flammable and/or combustible vapors and gases.
Conditions to avoid The SADT for this product is 176 F (80 C). The SADT (self-accelerating decomposition temperature) is an experimentally derived temperature at which a typical package of the product will undergo self-accelerating decomposition. Decomposition can be expected to be hazardous and uncontrollable. Under no circumstances should this product be exposed to temperatures near or above the emergency temperature of 167 F (75 C). Such an exposure could initiate hazardous decomposition. Contact with incompatible materials such as acids, alkalis, heavy metals and reducing agents will also result in hazardous decomposition.

11. TOXICOLOGICAL INFORMATION

Oral LD50	The oral LD50 for this material is > 2000 mg/kg in rats.
Dermal LD50	Dermal LD50 data is not available for this product. However, the following data is available for the technically pure peroxide: The acute dermal LD50 in rabbits is greater than 2000 mg/kg. It has been shown to be a severe irritant to rabbit skin.
Inhalation LC50	Inhalation toxicity data are not available for this product.
Skin	Prolonged or repeated skin contact may cause severe irritation with redness, swelling, blistering, and dermatitis.
Eye	The acute eye effects of this product have not been determined. However, the technically pure peroxide has been shown to be slightly irritating to rabbit eyes.
Chronic toxicity/carcinogenicity	Chronic ingestion effects of this product are not known. Prolonged and/or repeated inhalation may cause respiratory tract irritation. While this product has not been evaluated for mutagenicity, the technically pure peroxide was not mutagenic in the Ames Test. The reproductive toxicity of this product is not known.

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	The neurotoxic effects of this product are not known. Overexposure to this product may affect the skin, eyes and respiratory system.
Other toxicological information	No other toxic effects for this product are known.

12. ECOLOGICAL INFORMATION

Ecotoxicological information	The ecological toxicity of this product is not known.
Bioaccumulation	Chemical fate information on this product is not known.
Other information	Other ecological information on this product is not known.

13. DISPOSAL CONSIDERATIONS

Waste disposal in accordance with regulations	The characteristic of reactivity per RCRA would be exhibited by the unused product if it becomes a waste material.
Container disposal	Containers should be drained of residual product before disposal. Empty containers should be disposed of in accordance with all applicable laws and regulations.

14. TRANSPORT INFORMATION

Shipping description	ORGANIC PEROXIDE TYPE D, LIQUID (2,5-DIMETHYL-2,5-DI-(TERT-BUTYLPEROXY)HEXANE, 94%) 5.2, UN3105, PG II NORTH AMERICAN ERG NO: 145
Required labels	ORGANIC PEROXIDE.
Environmentally hazardous substance	This product does not contain an environmentally hazardous substance per 49 CFR 172.101, Appendix A.

15. REGULATORY INFORMATION

Products and/or components listed below are subject to the following:	
2,5-Dimethyl-2,5-di-(tert-butylperoxy)hexane	
New Jersey R-T-K Hazard. Sub.	yes
Toxic Subst. Cont. Act -listed	yes
Domestic Substance List-Canada	yes
Di-tert-butyl peroxide	
Massachusetts Substance List	yes
New Jersey R-T-K Hazard. Sub.	yes
Penn. Hazardous Substance list	yes
Toxic Subst. Cont. Act -listed	yes
Domestic Substance List-Canada	yes
2,4,4-trimethyl-1-pentene	
Toxic Subst. Cont. Act -listed	yes

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Domestic Substance List-Canada	yes
2,5-Dimethyl-2,5-dihydroperoxyhexane	
New Jersey R-T-K Hazard. Sub.	yes
Toxic Subst. Cont. Act -listed	yes
Non-Domestic Subst.List-Canada	yes

Hazard classes	
Description	Applicable
HMIS Hazard Rating Source	HMIS
HMIS Health	2
HMIS Flammability	2
HMIS Reactivity	2
WHMIS Hazard Class	B-3,C,D-2B,F

Other regulatory information

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

16. OTHER INFORMATION

Other information

TRIGONOX is a registered trademark of Akzo Nobel Chemicals Inc.

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