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Material Safety Data Sheet

TRIGONOX V388 IMPORTED CATALYST

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE

Product Information
Trade name : TRIGONOX V388 IMPORTED CATALYST
Use of the Substance/Mixture : Specific use(s): Polymerization initiator

2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance	
Form	liquid
Colour	colourless
Odour	Faint.
GB 6944/12268	
UN number	UN 3105
Proper shipping name	ORGANIC PEROXIDE TYPE D, LIQUID (Methyl ethyl ketone peroxide)
Class	5.2
Packing group	Not Assigned
Hazard Summary	
General advice	Immediate medical attention is required. Move out of dangerous area. Show this safety data sheet to the doctor in attendance.
Physical and chemical hazards	Flammable liquid and vapour. Heating may cause a fire.

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Health hazards	
Inhalation	Inhalation of aerosols may cause irritation to mucous membranes. Thermal decomposition can lead to release of irritating gases and vapours. Harmful if inhaled.
Skin	Symptoms may be delayed. Causes severe skin burns.
Eyes	Causes serious eye damage.
Ingestion	Harmful if swallowed. Causes burns.
Environmental hazards	
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Toxic to aquatic life.	

GHS Classification

Flammable liquids, Category 3 Organic peroxides, Type D Acute toxicity, Category 4, Oral Acute toxicity, Category 4, Inhalation
Skin corrosion/irritation, Category 1
Serious eye damage/eye irritation, Category 1
Specific target organ toxicity - repeated exposure, Category 2, Kidney
Acute aquatic toxicity, Category 2

GHS label elements

Hazard pictograms



Signal word

: Danger

Hazard statements

: H226 Flammable liquid and vapour.
H242 Heating may cause a fire.
H302 + H332 Harmful if swallowed or if inhaled.
H314 Causes severe skin burns and eye damage.
H373 May cause damage to organs (Kidney) through prolonged or repeated exposure.
H401 Toxic to aquatic life.

Precautionary statements

: **Prevention:**
P210 Keep away from heat/sparks/open flames/hot surfaces.
No smoking.
P220 Keep/Store away from clothing/ combustible materials.
P233 Keep container tightly closed.
P234 Keep only in original container.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.
P260 Do not breathe mist, vapours or spray.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P273 Avoid release to the environment.

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P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth.

P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.

P314 Get medical advice/ attention if you feel unwell.

P363 Wash contaminated clothing before reuse.

P370 + P378 In case of fire: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide to extinguish.

Storage:

P403 + P235 Store in a well-ventilated place. Keep cool.

P405 Store locked up.

P410 Protect from sunlight.

P420 Store away from other materials.

Disposal:

P501 Dispose of contents/container in accordance with local regulation.

Physical and chemical hazards

Flammable liquid and vapour.
Heating may cause a fire.

Health hazards

Inhalation

: Inhalation of aerosols may cause irritation to mucous membranes.
Thermal decomposition can lead to release of irritating gases and vapours.
Harmful if inhaled.

Skin

: Symptoms may be delayed.
Causes severe skin burns.

Eyes

: Causes serious eye damage.

Ingestion

: Harmful if swallowed.
Causes burns.

Further information

: Solvents may degrease the skin.
May cause damage to organs through prolonged or repeated exposure.

Test result

Acute oral toxicity

: Acute toxicity estimate: 1,038 mg/kg
Method: Calculation method

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Acute inhalation toxicity

: Acute toxicity estimate : 3 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: Calculation method

Acute dermal toxicity

: Acute toxicity estimate: > 5,000 mg/kg
Method: Calculation method

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Environmental hazards

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Toxic to aquatic life.

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Other hazards

No further data available.

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3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature : Mixture

Hazardous substance

Chemical name	CAS-No.	Classification	Concentration [%]
Dimethyl phthalate	131-11-3	Aquatic Acute 3; H402	20-45
Methyl ethyl ketone peroxide; Reaction mass of butane-2,2-diyl dihydroperoxide and di-sec-butylhexaoxidane	1338-23-4	Org. Perox. B; H241 Acute Tox. 4; H302 Acute Tox. 4; H332 Acute Tox. 5; H313 Skin Corr./Irrit. 1; H314 Eye Dam./Irrit. 1; H318 Aquatic Acute 2; H401	35 - 45
Diethylene glycol	111-46-6	Acute Tox. 4; H302 STOT RE 2; H373	10-19
Methyl ethyl ketone	78-93-3	Flam. Liq. 2; H225 Acute Tox. 5; H303 Eye Dam./Irrit. 2A; H319 STOT SE 3; H336	3-7
Hydrogen peroxide solution	7722-84-1	Ox. Liq. 1; H271 Acute Tox. 4; H302 Acute Tox. 4; H332 Skin Corr./Irrit. 1A; H314 Eye Dam./Irrit. 1; H318 STOT SE 3; H335 Aquatic Acute 2; H401 Aquatic Chronic 3; H412	1-5

Remarks : 2-Butanone, peroxide [active oxygen content $\leq 10\%$, containing $\geq 55\%$ type A thinner]

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

4. FIRST AID MEASURES

General advice : Immediate medical attention is required.
Move out of dangerous area.
Show this safety data sheet to the doctor in attendance.

Inhalation : If breathed in, move person into fresh air.
Consult a physician after significant exposure.

Skin contact : Take off contaminated clothing and shoes immediately.
Rinse immediately with plenty of water.

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Eye contact

Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and with difficulty.

- : Rinse with plenty of water.
- Get medical attention immediately. Continue to rinse during transport.
- Remove contact lenses.
- Protect unharmed eye.
- Keep eye wide open while rinsing.
- Small amounts splashed into eyes can cause irreversible tissue damage and blindness.

Ingestion

- : Clean mouth with water and drink afterwards plenty of water.
- Never give anything by mouth to an unconscious person.
- Take victim immediately to hospital.
- Do not induce vomiting! May cause chemical burns in mouth and throat.

Notes to physician

Symptoms

- : The symptoms and effects are as expected from the hazards as shown in section 2. No specific product related symptoms are known.

Risks

- : Harmful if swallowed or if inhaled.
- Causes serious eye damage.
- May cause damage to organs through prolonged or repeated exposure.
- Causes severe burns.

Treatment

- : Treat symptomatically.

5. FIREFIGHTING MEASURES

Suitable extinguishing media : Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Specific hazards during firefighting / Specific hazards arising from the chemical

- : CAUTION: reignition may occur.
- Supports combustion.
- Water spray may be ineffective unless used by experienced firefighters.
- Do not allow run-off from fire fighting to enter drains or water courses.
- Hazardous decomposition products formed under fire conditions.

Combustion products

- : Fire will produce smoke containing hazardous combustion products (see section 10).
- Carbon oxides
- Oxygen

Special protective equipment for firefighters

- : In the event of fire, wear self-contained breathing apparatus.

Further information

- : Use water spray to cool unopened containers.

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Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions : Use personal protective equipment.
Wear respiratory protection.
Ensure adequate ventilation.
Remove all sources of ignition.
Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

Emergency measures on accidental release : Evacuate personnel to safe areas.
Only qualified personnel equipped with suitable protective equipment may intervene.
Prevent unauthorised persons entering the zone.

Environmental precautions : Prevent product from entering drains.
If the product contaminates rivers and lakes or drains inform respective authorities.

Methods for cleaning up /
Methods for containment : Soak up with inert absorbent material and dispose of as hazardous waste.
Keep wetted with water.
Confinement must be avoided.
Never return spills in original containers for re-use.

Reference to other sections : For disposal considerations see section 13.
For personal protection see section 8.

HANDLING AND STORAGE

Handling

Advice on safe handling : For personal protection see section 8.
Avoid formation of aerosol.
Do not breathe vapours or spray mist.
Smoking, eating and drinking should be prohibited in the application area.
Provide sufficient air exchange and/or exhaust in work rooms.
Container may be opened only under exhaust ventilation hood.
Open drum carefully as content may be under pressure.
Dispose of rinse water in accordance with local and national regulations.

Advice on protection against fire and explosion : Use explosion protected equipment.
Avoid formation of aerosol.
Keep away from sources of ignition - No smoking.
No sparking tools should be used.
Keep away from reducing agents (e.g. amines), acids, alkalies

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and heavy metal compounds (e.g. accelerators, driers, metal soaps).

Do not cut or weld on or near this container even when empty.
Take measures to prevent the build up of electrostatic charge.
Keep away from combustible material.

Temperature class

: It is recommended to use electrical equipment of temperature group T3. However, autoignition can never be excluded.

Storage

Requirements for storage areas and containers

: Prevent unauthorized access.
No smoking.
Keep in a well-ventilated place.
Electrical installations / working materials must comply with the technological safety standards.
Keep only in original container.
Store away from other materials.

Maximum storage temperature:

: 25 °C

Other data

: No decomposition if stored and applied as directed.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value	Control parameters	Update	Basis	Form of exposure
Methyl ethyl ketone	78-93-3	PC-TWA	300 mg/m ³	2007-04-27	GBZ 2.1-2007	
		PC-STEL	600 mg/m ³	2007-04-27	GBZ 2.1-2007	
Hydrogen peroxide solution	7722-84-1	PC-TWA	1.5 mg/m ³	2007-04-27	GBZ 2.1-2007	

ACGIH: American Conference of Governmental Industrial Hygienists

BEI: Biological Exposure Index

MAC: Maximum Allowable Concentration

NIOSH: National Institute for Occupational Safety and Health

OEL: OEL: Occupational exposure limit.

STEL: Short term exposure limit

TWA: Time Weighted Average

Occupational exposure limits of decomposition products

Decomposition products	CAS-No.	Value	Control parameters	Update	Basis	Form of exposure
Formic acid	64-18-6, 64-18-6	PC-TWA	10 mg/m ³	2007-04-27	GBZ 2.1-2007	
		PC-STEL	20 mg/m ³	2007-04-27	GBZ 2.1-2007	

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Acetic acid	64-19-7, 64-19-7	PC-TWA	10 mg/m3	2007-04-27	GBZ 2.1-2007	
		PC-STEL	20 mg/m3	2007-04-27	GBZ 2.1-2007	
Propionic acid	79-09-4, 79-09-4	PC-TWA	30 mg/m3	2007-04-27	GBZ 2.1-2007	
Methyl ethyl ketone	78-93-3, 78-93-3	PC-TWA	300 mg/m3	2007-04-27	GBZ 2.1-2007	
		PC-STEL	600 mg/m3	2007-04-27	GBZ 2.1-2007	

Appropriate engineering controls

Explosion proof ventilation recommended.

Effective exhaust ventilation system

Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protective equipment

Respiratory protection : In the case of vapour or aerosol formation use a respirator with an approved filter.
Filter A

Hand protection : Neoprene

Nitrile rubber

Eye/face protection : Tightly fitting safety goggles
Wear face-shield and protective suit for abnormal processing problems.

Skin and body protection : Protective suit

Hygiene measures : Handle in accordance with good industrial hygiene and safety practice.
When using do not eat or drink.
When using do not smoke.
Wash hands before breaks and at the end of workday.

Environmental exposure controls

General advice : Prevent product from entering drains.
If the product contaminates rivers and lakes or drains inform respective authorities.

9. PHYSICAL AND CHEMICAL PROPERTIES**Appearance**

Form : liquid

Colour : colourless

Odour : Faint.

Odour Threshold : No data available

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Safety data

pH	: Weakly acidic
Melting point	: <=-10 °C
Boiling point/boiling range	: Decomposes below the boiling point.
Flash point	: 37 °C Method: closed cup
Evaporation rate	: No data available
Flammability (solid, gas)	: Not applicable
Flammability (liquids)	: Decomposition products may be flammable.
Lower explosion limit	: No data available
Upper explosion limit	: No data available
Vapour pressure	: not determined
Relative vapour density	: No data available
Relative density	: 1.12 at 20 °C
Bulk density	: Not applicable
Water solubility	: at 20 °C partly miscible
Solubility in other solvents	: 20 °C Miscible with:, Phthalates
Partition coefficient: n-octanol/water	: No data available
Auto-ignition temperature	: Test method not applicable
Decomposition temperature	: SADT - (Self accelerating decomposition temperature) is the lowest temperature at which self-accelerating decomposition may occur with a substance in the packaging as used in transport. A dangerous self-accelerating decomposition reaction and, under certain circumstances, explosion or fire can be caused by thermal decomposition at and above the SADT. Contact with incompatible substances can cause decomposition below the SADT.
Self-Accelerating decomposition temperature (SADT)	: 55 °C
Viscosity, dynamic	: No data available

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Viscosity, kinematic : No data available

Explosive properties : Not explosive

Oxidizing properties : Not classified as oxidising.

Active Oxygen Content : 9.8 - 10.0 %

Organic peroxides : 36 - 50 %

This safety datasheet only contains information relating to safety and does not replace any product information or product specification.

10. STABILITY AND REACTIVITY

Conditions to avoid : Confinement must be avoided.
Heat, flames and sparks.

Materials to avoid : Contact with the following incompatible materials will result in hazardous decomposition:
Acids and bases
Iron
Copper
Reducing agents
Heavy metals
Rust
Do not mix with peroxide accelerators, unless under controlled processing.
Use only stainless steel 316, PP, polyethylene or glass-lined equipment.
For queries regarding the suitability of other materials please contact the supplier.

Hazardous decomposition products : Carbon oxides
Formic acid
Acetic acid
Propionic acid
Methyl ethyl ketone

Thermal decomposition : SADT - (Self accelerating decomposition temperature) is the lowest temperature at which self-accelerating decomposition may occur with a substance in the packaging as used in transport. A dangerous self-accelerating decomposition reaction and, under certain circumstances, explosion or fire can be caused by thermal decomposition at and above the SADT. Contact with incompatible substances can cause decomposition below the SADT.

Reactivity : Stable under normal conditions.

Chemical stability : Stable under recommended storage conditions.

Hazardous reactions : No dangerous reaction known under conditions of normal use.

Self-Accelerating decomposition temperature (SADT) 55 °C

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11. TOXICOLOGICAL INFORMATION

PRODUCT INFORMATION:

Hazard Summary

Acute toxicity : Harmful if swallowed or if inhaled.

Skin corrosion/irritation : Causes severe burns.

Serious eye damage/eye irritation : Causes serious eye damage.

Respiratory or skin sensitisation : Respiratory sensitisation: Not classified based on available information.
Skin sensitisation: Not classified based on available information.

Germ cell mutagenicity : Not classified based on available information.

Carcinogenicity : Not classified based on available information.

Reproductive toxicity : Not classified based on available information.

STOT - single exposure : Not classified based on available information.

STOT - repeated exposure : May cause damage to organs (Kidney) through prolonged or repeated exposure.

Aspiration hazard : Not classified based on available information.

Potential Health Effects

Inhalation : Inhalation of aerosols may cause irritation to mucous membranes.
Thermal decomposition can lead to release of irritating gases and vapours.
Harmful if inhaled.

Skin : Symptoms may be delayed.
Causes severe skin burns.

Eyes : Causes serious eye damage.

Ingestion : Harmful if swallowed.
Causes burns.

Aggravated Medical Condition : None known.

Symptoms of Overexposure : The symptoms and effects are as expected from the hazards as shown in section 2. No specific product related symptoms are known.

Toxicology Assessment

Further information : Solvents may degrease the skin.
May cause damage to organs through prolonged or repeated Exposure.

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Fax #: (032) 421-7789 ; 346-1817

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Test result

Acute oral toxicity

: Acute toxicity estimate: 1,038 mg/kg
Method: Calculation method

Acute inhalation toxicity

: Acute toxicity estimate : 3 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: Calculation method

Acute dermal toxicity

: Acute toxicity estimate: > 5,000 mg/kg
Method: Calculation method

TOXICOLOGY DATA FOR THE COMPONENTS:

Toxicology Assessment

Component: Dimethyl phthalate

Further information : No further data available.

Component: Hydrogen peroxide solution

Further information : No further data available.

Test result

Component: Dimethyl phthalate

Acute oral toxicity : LD50: > 5,000 mg/kg
Species: Rat

Acute inhalation toxicity : Assessment: The substance or mixture has no acute inhalation toxicity

Acute dermal toxicity : LD50: > 10,000 mg/kg
Species: Rabbit

Skin irritation : Result: slight irritation

Eye irritation : Result: Slightly irritating to eyes.

Aspiration toxicity : No aspiration toxicity classification

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Component: Methyl ethyl ketone peroxide: Reaction mass of butane-2,2-diyl dihydroperoxide and di-sec-butylhexaoxidane

Acute oral toxicity	: LD50: 1,017 mg/kg Species: Rat
Acute inhalation toxicity	: LC50 (Rat): 1.5 mg/l Exposure time: 4 h Test atmosphere: dust/mist
Acute dermal toxicity	: LD50: 4,000 mg/kg Species: Rat
Skin irritation	: Result: Causes burns.
Eye irritation	: Result: Risk of serious damage to eyes.
Germ cell mutagenicity Genotoxicity in vitro	: Ames test Result: negative
Genotoxicity in vivo	: Not classified due to data which are conclusive although insufficient for classification.
Carcinogenicity	: No data available
Reproductive toxicity/Fertility	: Species: Rat, male and female Application Route: Oral Dose: 0, 25, 50, 75 milligram per kilogram General Toxicity - Parent: No observed adverse effect level: 50 mg/kg bw/day General Toxicity F1: No observed adverse effect level F1: 50 mg/kg bw/day Fertility: No observed adverse effect level Parent: 75 mg/kg bw/day Method: OECD Test Guideline 421 GLP: yes
Target Organ Systemic Toxicant - Repeated exposure	: The substance or mixture is not classified as specific target organ toxicant, repeated exposure.
Aspiration toxicity	: No aspiration toxicity classification

Component: Diethylene glycol

Acute oral toxicity	: LD50: > 300 - 2,000 mg/kg Species: Rat
Skin irritation	: Species: Rabbit Result: No skin irritation Method: Draize Test Exposure time: 23 h Literature data.

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Eye irritation

: Species: Rabbit
Result: No eye irritation
Exposure time: 24 h
Literature data.

Sensitisation

: Species: Guinea pig
Result: Does not cause skin sensitisation.

Target Organ Systemic
Toxicant - Repeated
exposure

: Target Organs: Kidney
May cause damage to organs through prolonged or repeated
exposure.

Component: Methyl ethyl ketone

Acute oral toxicity : LD50: 2,737 mg/kg
Species: Rat

Acute dermal toxicity : LD50: 6,480 mg/kg
Species: Rabbit

Skin irritation : Result: Repeated exposure may cause skin dryness or
cracking.
Moderately irritating.

Eye irritation : Result: Irritating to eyes.

Target Organ Systemic
Toxicant - Single exposure : Exposure routes: Inhalation
The substance or mixture is classified as specific target organ
toxicant, single exposure, category 3 with narcotic effects.

Aspiration toxicity : No aspiration toxicity classification

Component: Hydrogen peroxide solution

Acute oral toxicity : LD50: 431 mg/kg
Species: Rat
Method: OECD Test Guideline 401
Literature data.

Acute inhalation toxicity : LC50 : 1.5 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: Expert judgement

Assessment: The substance or mixture is classified as specific
target organ toxicant, single exposure, category 3 with
respiratory tract irritation.

Acute dermal toxicity : LD50 Dermal: > 2,000 mg/kg
Species: Rabbit
Literature data.

Skin irritation : Result: Causes severe burns.

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Germ cell mutagenicity

Genotoxicity in vivo

: Species: Mouse
Method: Mutagenicity (micronucleus test)
Result: negative
Literature data.

12. ECOLOGICAL INFORMATION

PRODUCT INFORMATION:

Ecotoxicology Assessment

Additional ecological information

: An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Toxic to aquatic life.

COMPONENTS:

Ecotoxicology Assessment

Component: Dimethyl phthalate

Acute aquatic toxicity

: Harmful to aquatic life.

Additional ecological information

: An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Harmful to aquatic life.

Component: Hydrogen peroxide solution

Chronic aquatic toxicity

: Harmful to aquatic life with long lasting effects.

Additional ecological information

: An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Toxic to aquatic life.
Harmful to aquatic life with long lasting effects.

Test result

Component: Dimethyl phthalate

Ecotoxicity effects

Toxicity to fish

: LC50: 420 mg/l
Exposure time: 96 h
Species: *Lepomis macrochirus* (Bluegill sunfish)

Toxicity to algae

: EC10: 193.09 mg/l
Exposure time: 72 h
Species: *Desmodesmus subspicatus* (green algae)
Test Type: Growth inhibition
Method: OECD Test Guideline 201

ErC50: 259.76 mg/l
Exposure time: 72 h

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Toxicity to fish (Chronic toxicity)

Species: *Desmodesmus subspicatus* (green algae)
Test Type: Growth inhibition
Method: OECD Test Guideline 201

: NOEC: 11 mg/l
Exposure time: 102 d
Species: *Oncorhynchus mykiss* (rainbow trout)
Test Type: flow-through test
Method: Other guidelines

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)

: NOEC: 9.6 mg/l
Exposure time: 21 d reproduction rate
Species: *Daphnia magna* (Water flea)
Method: Other guidelines

Elimination information (persistence and degradability)

Bioaccumulation

: Species: Fish
Exposure time: 1 d
Bioconcentration factor (BCF): 5.4

Biodegradability

: Result: Readily biodegradable.

Component: Methyl ethyl ketone peroxide: Reaction mass of butane-2,2-diyl dihydroperoxide and di-sec-butylhexaoxidane

Ecotoxicity effects

Toxicity to fish

: LC50: 44.2 mg/l
Exposure time: 96 h
Species: *Poecilia reticulata* (guppy)
Test Type: semi-static test

Toxicity to daphnia and other aquatic invertebrates

: 39 mg/l
Exposure time: 48 h
Species: *Daphnia magna* (Water flea)
Test Type: Immobilization

Toxicity to algae

: ErC50: 5.6 mg/l
Exposure time: 72 h
Species: *Pseudokirchneriella subcapitata* (algae)
Test Type: Growth inhibition

Toxicity to bacteria

: EC10: 12 mg/l
Exposure time: 0.5 h
Species: activated sludge
Test Type: Respiration inhibition
Method: Domestic OECD Guideline 209

Elimination information (persistence and degradability)

Bioaccumulation

: Bioconcentration factor (BCF): 10.3
Not expected considering the low log Pow value.

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Biodegradability

: Result: Readily biodegradable.
Method: Closed Bottle test

Component: Diethylene glycol

Ecotoxicity effects

Toxicity to fish

: LC50: 75,200 mg/l
Exposure time: 96 h
Species: Pimephales promelas (fathead minnow)

Toxicity to daphnia and other aquatic invertebrates

: EC50: 48,900 mg/l
Exposure time: 48 h
Species: Daphnia magna (Water flea)

Toxicity to fish (Chronic toxicity)

: NOEC: 15,380 mg/l
Exposure time: 7 d
Species: Pimephales promelas (fathead minnow)
Literature data.

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)

: NOEC: 8,590 mg/l
Literature data.

Elimination information (persistence and degradability)

Bioaccumulation

: Bioaccumulation is unlikely.

Mobility

: Adsorption to the solid soil particles is not expected.

Biodegradability

: Result: Readily biodegradable.
Method: OECD Test Guideline 301A

Further information on ecology

Biochemical Oxygen Demand (BOD)

: No data available

Component: Methyl ethyl ketone

Ecotoxicity effects

Toxicity to fish

: LC50: 3,220 mg/l
Exposure time: 96 h
Species: Lepomis macrochirus (Bluegill sunfish)

Elimination information (persistence and degradability)

Biodegradability

: Result: Readily biodegradable.

Component: Hydrogen peroxide solution

Ecotoxicity effects

Toxicity to fish

: LC50: 16.4 mg/l
Exposure time: 96 h

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Species: Pimephales promelas (fathead minnow)
Test Type: semi-static test
Literature data.

Toxicity to daphnia and other aquatic invertebrates : LC50: 2.4 mg/l
Exposure time: 48 h
Species: Daphnia pulex (Water flea)
Test Type: semi-static test
Literature data.

Toxicity to algae : ErC50: 1.38 mg/l
Exposure time: 72 h
Species: Skeletonema costatum (marine diatom)
Test Type: static test
Literature data.

Elimination information (persistence and degradability)

Bioaccumulation : Bioaccumulation is unlikely.

Mobility : Can be leached out from soil.

Distribution among environmental compartments : Transport to air is not expected.

Further information on ecology

Biochemical Oxygen Demand (BOD) : No data available

13. DISPOSAL CONSIDERATIONS

Product : The product should not be allowed to enter drains, water courses or the soil.
Do not contaminate ponds, waterways or ditches with chemical or used container.
Hazardous waste
Dispose of contents/container in accordance with local regulation.

Contaminated packaging : Empty remaining contents.
Dispose of as unused product.
Do not burn, or use a cutting torch on, the empty drum.
Due to the high risk of contamination recycling/recovery is not recommended.
Follow all warnings even after the container is emptied.

14. TRANSPORT INFORMATION

International Regulations

IATA-DGR

UN/ID No. : UN 3105
Proper shipping name : Organic peroxide type D, liquid

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(Methyl ethyl ketone peroxide)

Class : 5.2
Subsidiary risk : HEAT
Packing group : Not Assigned
Labels : 5.2 (HEAT)
Packing instruction (cargo aircraft) : 570
Packing instruction (passenger aircraft) : 570
Environmentally hazardous : no

IMDG-Code

UN number : UN 3105
Proper shipping name : ORGANIC PEROXIDE TYPE D, LIQUID (Methyl ethyl ketone peroxide)
Class : 5.2
Packing group : Not Assigned
Labels : 5.2
EmS Code : F-J, S-R
Marine pollutant : no

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

National Regulations

GB 6944/12268

UN number : UN 3105
Proper shipping name : ORGANIC PEROXIDE TYPE D, LIQUID (Methyl ethyl ketone peroxide)
Class : 5.2
Packing group : Not Assigned
Labels : 5.2
Environmentally hazardous : no

15. REGULATORY INFORMATION

Notification status

DSL : YES. All components of this product are on the Canadian DSL
AICS : YES. On the inventory, or in compliance with the inventory
NZIoC : NO. Not in compliance with the inventory
ENCS : YES. On the inventory, or in compliance with the inventory
ISHL : YES. On the inventory, or in compliance with the inventory
KECI : YES. On the inventory, or in compliance with the inventory
PICCS : YES. On the inventory, or in compliance with the inventory
IECSC : YES. On the inventory, or in compliance with the inventory
TCSI : YES. On the inventory, or in compliance with the inventory
TSCA : YES. All chemical substances in this product are either listed on the TSCA Inventory or in compliance with a TSCA Inventory exemption.

For explanation of abbreviation see section 16.

National regulatory information

Regulations on Safety Management of Hazardous Chemicals

Catalogue of Hazardous Chemicals : Listed
Identification of Major Hazard Installations for Dangerous Chemicals (GB 18218)
Category Threshold quantity

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Organic peroxides

50 t

Identification of Major Hazard Installations for Dangerous Chemicals (GB 18218)

Category

Threshold quantity

Flammable liquids

5,000 t

Further information

Law on the Prevention and Control of Occupational Diseases

16. OTHER INFORMATION**Full text of H-Statements**

H225	: Highly flammable liquid and vapour.
H241	: Heating may cause a fire or explosion.
H271	: May cause fire or explosion; strong oxidizer.
H302	: Harmful if swallowed.
H303	: May be harmful if swallowed.
H313	: May be harmful in contact with skin.
H314	: Causes severe skin burns and eye damage.
H318	: Causes serious eye damage.
H319	: Causes serious eye irritation.
H332	: Harmful if inhaled.
H335	: May cause respiratory irritation.
H336	: May cause drowsiness or dizziness.
H373	: May cause damage to organs through prolonged or repeated exposure.
H401	: Toxic to aquatic life.
H402	: Harmful to aquatic life.
H412	: Harmful to aquatic life with long lasting effects.

Full text of other abbreviations

GBZ 2.1-2007	: Occupational exposure limits for hazardous agents in the workplace - Chemical hazardous agents.
GBZ 2.1-2007 / PC-TWA	: Permissible concentration - time weighted average
GBZ 2.1-2007 / PC-STEL	: Permissible concentration - short term exposure limit

AICS - Australian Inventory of Chemical Substances; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; CPR - Controlled Products Regulations; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; 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; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; 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

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Ships; n.o.s. - Not Otherwise Specified; Nch - Chilean Norm; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; 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; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative; WHMIS - Workplace Hazardous Materials Information System

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The data and information contained in this Material Safety Data Sheet is provided to the best of our knowledge and ability on existing hazards, properties and handling of this product as recommended. It is recommended that the user tests the product according to its purpose. The user is responsible for the proper, safe and lawful use of this product. The information contained in this MSDS is subject to change without further notice. © 20

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TECHNICAL DATA SHEET

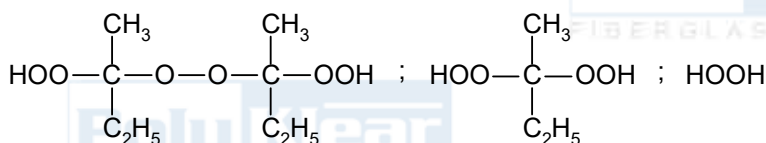
TRIGONOX V388 IMPORTED CATALYST

Product Name

TRIGONOX V388 IMPORTED CATALYST

Product description

Methyl ethyl ketone peroxide, in solvent mixture



CAS No. : 1338-23-4
EINECS/ELINCS No. : 215-661-2
TSCA status : listed on inventory

Specifications

Appearance : Clear and colorless liquid
Total active oxygen : 9.8-10.0%

Characteristics

Density, 20°C : 1.120 g/cm³
Flash point : 37°C (Closed Cup)
: >63°C (Open Cup)

Storage

Due to the relatively unstable nature of organic peroxides a loss of quality can be detected over a period of time. To minimize the loss of quality, AkzoNobel recommends a maximum storage temperature (T_s max.) for each organic peroxide product.

For *Trigonox* V388 T_s max. = 25°C
T_s min. = -10°C

When stored under the recommended storage conditions, *Trigonox* V388 will remain within the specifications for a period of at least 3 months after delivery.

Thermal stability

Organic peroxides are thermally unstable substances, which may undergo self-accelerating decomposition. The lowest temperature at which self-accelerating decomposition of a substance in the original packaging may occur is the Self-Accelerating Decomposition Temperature (SADT). The SADT is determined on the basis of the Heat Accumulation Storage Test.

For *Trigonox* V388 SADT : 55°C

The Heat Accumulation Storage Test is a recognized test method for the determination of the SADT of organic peroxides (see Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria - United Nations, New York and Geneva).

Major decomposition products

Carbon dioxide, Water, Acetic acid, Formic acid, Propanoic acid, Methyl ethyl ketone

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Packaging and transport

The standard packaging is a 30 l HDPE can (Nourytainer[®]) for 20 kg peroxide solution.

Both packaging and transport meet the international regulations. *Trigonox V388* is classified as Organic peroxide type D; liquid; Division 5.2; UN 3105; PG II.

Safety and handling

Keep containers tightly closed. Store and handle *Trigonox V388* in a dry well-ventilated place away from sources of heat or ignition and direct sunlight. Never weigh out in the storage room.

Avoid contact with reducing agents (e.g. amines), acids, alkalis and heavy metal compounds (e.g. accelerators, driers and metal soaps).

Please refer to the Material Safety Data Sheet (MSDS) for further information on the safe storage, use and handling of *Trigonox V388*. This information should be thoroughly reviewed prior to acceptance of this product.

Applications

Trigonox V388 is general purpose methyl ethyl ketone peroxide (MEKP) for the curing of unsaturated polyester resins in the presence of a cobalt accelerator at room and elevated temperatures.

The curing system *Trigonox V388*/cobalt accelerator is developed for general purpose GRP- and non GRP-applications such as the curing of laminating resins and castings.

Practical experience throughout many years has proven that for marine applications a special MEKP with low water content and without polar compounds is demanded in order to prevent from osmosis and other problems. Butanox[®] M-50 is the MEKP advised for this application.

For room temperature application it is necessary to use *Trigonox V388* together with a cobalt accelerator (e.g. Accelerator NL-49P).

Dosing

Depending on working conditions, the following peroxide and accelerator dosage levels are recommended:

<i>Trigonox V388</i>	1 - 4 phr*
Accelerator NL-49P	0.5 - 3 phr

Cure Characteristics

In a high reactive standard orthophthalic resin in combination with Accelerator NL-49P (= 1% cobalt) the following application characteristics were determined:

Gel times at 20°C

2 phr <i>Trigonox V388</i> + 0.5 phr Accelerator NL-49P	13 minutes
2 phr <i>Trigonox V388</i> + 1.0 phr Accelerator NL-49P	7 minutes

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FIBERGLASS + RESIN**Cure of 4 mm laminates at 20°C**

4 mm laminates have been made with a 450 g/m² glass chopped strand mat. The glass content in the laminates is 30% (w/w).

The following parameters were determined:

- Time-temperature curve.
- Speed of cure expressed as the time to achieve a Barcol hardness (934-1) of 0-5 and 25-30 respectively.
- Residual styrene content after 24 h at 20°C and a subsequent postcure of 8 h at 80°C.

	Gel time (min.)	Time to Peak (min.)	Peak exotherm (°C)
2 phr <i>Trigonox</i> V388 + 0.5 phr Accelerator NL-49P	14	30	51
2 phr <i>Trigonox</i> V388 + 1.0 phr Accelerator NL-49P	6	21	74

	Barcol 0-5 (h)	Barcol 25-30 (h)	Res. styrene 24 h 20°C (%)	Res. styrene + 8 h 80°C (%)
2 phr <i>Trigonox</i> V388 + 0.5 phr Accelerator NL-49P	<1	4	6.5	0.5
2 phr <i>Trigonox</i> V388 + 1.0 phr Accelerator NL-49P	<1	<1	4.9	0.3

Pot life at 20°C

Pot lives were determined of a mixture of *Trigonox* V388 and a non-preaccelerated UP resin at 20°C.

2 phr <i>Trigonox</i> V388	22 h
4 phr <i>Trigonox</i> V388	13 h

Solubility

Trigonox V388 is miscible with phthalates and slightly miscible with water.

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