

SAFETY DATA SHEET**HYPROX(TM)200-400 HYDROGEN PEROXIDE (US-GHS Haz)**

Material no.		Version	2.0 / US
Specification	140616	Revision date	05/21/2015
Order Number		Print Date	06/01/2015
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1. Identification**1.1. Product identifier**

Trade name	HYPROX(TM)200-400 HYDROGEN PEROXIDE (US-GHS Haz)
CAS-No.	7722-84-1

1.2. Recommended use of the chemical and restrictions on use

Relevant applications identified	For industrial use
Function	For oxidation

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**

Globally Harmonized System of Classification and Labelling of Chemicals (GHS)

Acute toxicity (Oral)	Category 4	H302
Skin irritation	Category 2	H315
Eye irritation	Category 2A	H319
Specific target organ toxicity - single exposure (Respiratory system)	Category 3	H335
Acute aquatic toxicity	Category 2	H401
Chronic aquatic toxicity	Category 2	H411

2.2. Label elements

Statutory basis	Globally Harmonized System of Classification and Labelling of Chemicals (GHS)
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hazard-defining component(s) (GHS)

- hydrogen peroxide solution

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Symbol(s)



Signal word

Warning

Hazard statement

H302 - Harmful if swallowed.
H315 - Causes skin irritation.
H319 - Causes serious eye irritation.
H335 - May cause respiratory irritation.
H411 - Toxic to aquatic life with long lasting effects.

Precautionary statement
Prevention

P261 - Avoid breathing dust/ fume/ gas/ mist/ vapours/ 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.
P280 - Wear eye protection/ face protection.
P280 - Wear protective gloves.

Precautionary statement
Reaction

P301 + P312 + P330 - IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel unwell. Rinse mouth.
P302 + P352 - IF ON SKIN: Wash with plenty of water/ soap.
P304 + P340 + P312 - IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/ physician if you feel unwell.
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.
P391 - Collect spillage.

Precautionary statement
Storage

P403 + P233 - Store in a well-ventilated place. Keep container tightly closed.
P405 - Store locked up.

Precautionary statement
Disposal

P501 - Dispose of contents/ container to an approved waste disposal plant.

Supplemental hazard information / Label elements

2.3. Other hazards
None known**3. Composition/information on ingredients****Chemical nature**

aqueous solution, clear

• hydrogen peroxide solution

>= 20% - <= 40%

CAS-No. 7722-84-1

Oxidizing liquids
Acute toxicity (Oral)
Skin corrosion
Serious eye damage

Category 1
Category 4
Category 1A
Category 1

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Specific target organ toxicity - single exposure (Respiratory system)

Category 3

Acute aquatic toxicity

Category 2

Chronic aquatic toxicity

Category 3

Other information

This material is classified as hazardous under OSHA regulations.

See Section 8 for Exposure Guidelines

4. First aid measures**4.1. Description of first aid measures****General advice**

Pay attention to self-protection.

Remove victims from hazardous area. Immediately remove soiled or soaked clothing and remove it to a safe distance. Keep victim warm, in a stabilized position and covered.

Do not leave victims unattended.

If the casualty is unconscious: Place the victim in the recovery position.

Inhalation

Potential for exposure by inhalation if aerosols or mists are generated.

Move victims into fresh air.

With labored breathing: Provide with oxygen. Consult a doctor.

If the casualty is not breathing: Perform mouth-to-mouth resuscitation, notify emergency physician immediately.

Skin contact

Wash off affected area immediately with plenty of water for at least 15 minutes.

If symptoms persist, consult a physician for treatment.

Eye contact

With eye held open, thoroughly rinse immediately with plenty of water for at least 10 minutes.

Consult an ophthalmologist immediately if the symptoms persist.

When dealing with caustic substances, notify emergency physician immediately (key words: burns in eye).

Ingestion

Rinse mouth.

Immediately give large quantities of water to drink.

Obtain medical attention.

When dealing with caustic substances, notify emergency physician immediately.

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

Irritation of skin and mucous membranes

Causes burns.

daze,

headache, dizziness, somnolence (drowsiness), nausea.

Health injuries may be delayed.

Hazards

Strongly irritating to corrosive.

Harmful in contact with skin and if swallowed.

Vapours may cause drowsiness and dizziness.

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

The initial focus is only on the local action, characterized by quickly progressing deep tissue damage.

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In the eye, caustic/ irritating and harmful liquids cause, depending on the intensity of exposure, various levels of irritation, destruction, and ablation of the epithelium of the conjunctiva and cornea, corneal clouding, edema and ulcerations.

Danger! Possible loss of eyesight!

Superficial irritations and damage up to ulcerations and scarring develop on the skin.

After accidental absorption in the body, the pathology and clinical findings are dependent on the kinetics of the substance (quantity of absorbed substance, the absorption time, and the effectiveness of early elimination measures (first aid)/ excretion - metabolism).

A specific action of the substance is unknown.

In case of substances with high water solubility, irritations up to formation of necrosis in the upper respiratory tract may result after inhalation of caustic/ irritating aerosols and mists.

The initial focus is on the local action: signs of irritation of the respiratory tract such as coughing, burning behind the sternum, tears, burning in the eyes or nose.

There is a risk of pulmonary edema!

5. Fire-fighting measures**5.1. Extinguishing media**

Suitable extinguishing media: water spray, Adapt fire-extinguishing measures to surroundings, Foam, dry powder, Carbon dioxide (CO₂)

Unsuitable extinguishing media: organic compounds

5.2. Special hazards arising from the substance or mixture

Product is fire-stimulating.

Contact with the following substances may cause inflammation: flammable substances.

The product itself does not burn. Involved in fire, it may decompose yielding oxygen.

Risk of overpressure and burst due to decomposition in confined spaces and pipes.

Release of oxygen may support combustion. Strong oxidizer. Contact with combustible materials may cause a fire.

Contact with incompatible materials (e.g. metals, alkalis, and reducing agents) will cause hazardous decomposition resulting in the release of large quantities of heat, steam, and oxygen gas.

Danger of decomposition under influence of heat.

Lower Explosive Limit: Hydrogen Peroxide vapors >40% by weight (or 26% mol).

This product spontaneously decomposes above 150 degrees celcius. A severe detonation hazard may exist when mixed with organic liquids, e.g. kerosene or gasoline. Hydrogen Peroxide itself is not flammable.

Drying of product on clothing or combustible materials such as paper, fabrics, leather, and wood may cause fire. Mixtures of Hydrogen Peroxide with flammable liquids (solvents) may possess explosive properties. Contamination can cause rapid decomposition, release of oxygen and pressure.

Hydrogen Peroxide in the proximity of an ongoing fire must be diluted with large volumes of water.

5.3. Advice for firefighters

Evacuate personnel to safe areas.

Keep out unprotected persons.

Keep unauthorized persons away.

With large-scale fire, violent decomposition or even explosion is possible.

In the case of fire, cool the containers that are at risk with water or dilute with water (flooding).

or

In case of fire, remove the endangered containers and bring to a safe place, if this can be done safely.

Stay upwind; keep out of low areas.

Containers can build up pressure if exposed to heat (fire). Cool with water spray. As in any fire, wear self-contained, pressure-demand breathing apparatus (MSHA-NIOSH approved or equivalent) and full protective gear.

Use water spray or fog to knock down irritating vapor.

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In the case of fire, wear respiratory protective equipment independent of surrounding air and chemical protective suit.

6. Accidental release measures**6.1. Personal precautions, protective equipment and emergency procedures**

Product causes chemical burns. Evacuate personnel to safe areas. Keep out unprotected persons. Keep unauthorized persons away.

6.2. Environmental precautions

Observe regulations on prevention of water pollution (check, dam up, cover up)., Dam with sand or earth, Do not use: textiles, saw dust, combustible substances., Do not permit to enter into surface water, stretches of water, soil undiluted.

6.3. Methods and material for containment and cleaning up

In case of larger quantities: Collect product in suitable containers (e. g. made of plastic) using appropriate equipment (e. g. liquid pump). Keep away from flammable substances. Keep away from incompatible substances. Rinse away any residue with plenty of water. Dispose of absorbed material in accordance with the regulations. With small amounts: Dilute product with lots of water and rinse away. or Absorb with liquid-binding material, e. g.: diatomaceous earth or universal binder. Pick up mechanically. Collect in suitable containers. Clean contaminated surface thoroughly. Pack and label wastes like the pure substance. Do not detach label from the delivery containers prior to disposal.

Additional advice

Make safe or remove all sources of ignition.

Shut off leak, if possible and safe to do.

Isolate defective containers immediately, if possible and safe to do.

Place defective containers in waste receptacle (waste packaging receptacle) made of plastic (not metal).

Do not seal defective containers or waste receptacles airtight (danger of bursting due to product decomposition).

Never return spilled product into its original container for re-use. (Risk of decomposition.).

Never return spilled product into its original container. Never put spilled material into another container for disposal. Dilute with large amounts of water to a concentration of about 5% Hydrogen Peroxide; hold in diked area or pond until peroxide is completely decomposed or dispose of according to all relevant local, provincial, state, and federal laws and regulations. Ventilate area. Use personal protective equipment as described in section 8. If necessary, contact supplier for recommendations to decompose dilute peroxide (5%).

SPONTANEOUS COMBUSTION HAZARD: Combustible materials exposed to hydrogen peroxide should be immediately submerged in or rinsed with large amounts of water to ensure that all hydrogen peroxide is removed. Residual hydrogen peroxide that is allowed to dry (upon evaporation hydrogen peroxide can concentrate) on organic materials such as paper, fabrics, cotton, leather, wood, or other combustibles, can cause the material to ignite and result in a fire.

7. Handling and storage**7.1. Precautions for safe handling**

Handle in accordance with good industrial hygiene and safety practice. Avoid impurities and heat effect. Ensure there is good room ventilation. Avoid contact with skin, eyes and clothing. Do not inhale vapour, aerosols, mist. Wear personal protective equipment. Immediately change moistened and saturated work clothes. Immediately rinse contaminated or saturated clothing with water. Provide for installation of emergency shower and eye bath. Set up safety and operation procedures. Never return spilled product into its original container for re-use. (Risk of decomposition.).

7.2. Conditions for safe storage, including any incompatibilities

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Advice on protection against fire and explosion

Avoid sun rays, heat, heat effect.
Keep away from sources of ignition - No smoking.
Keep away from flammable substances.
Keep away from incompatible substances.

Storage

cool, dry, clean.
well ventilated
Jointless smooth concrete floor.
Recommendation: Acid-proof floor.
Only use containers which are specially permitted for: hydrogen peroxide and/or
For transport, storage and tank installations only use suitable materials.
Use adequate venting devices on all packages, containers and tanks and check correct operation periodically.
Do not confine product in unvented vessels or between closed valves.
Risk of overpressure and burst due to decomposition in confined spaces and pipes.
Packages, containers and tanks should regularly be checked by visual observation for any sign of abnormality, e.g. corrosion, exert pressure (bulging), temperature increase etc.
Transport and store container in upright position only.
Always close container tightly after removal of product.
Do not keep the container sealed.
Ensure tightness at all times. Avoid leakage.
Avoid residues of the product on the containers.

Suitable materials	stainless steel 304L or 316L passivated
Suitable materials	aluminium 5254 or 1060: min. 99.5 % passivated
Suitable materials	aluminium magnesium alloys, passivated
Suitable materials	polyethylene, polypropylene, polyvinyl chloride (PVC),
Suitable materials	polytetrafluoroethylene
Suitable materials	glass, ceramics.

Unsuitable materials Iron, Mild steel, Copper, Bronze, brass, Zinc, tin

Keep away from heat. Store in a cool, dry place. Keep container closed when not in use.

Consult NFPA 400 for storage area guidance. Storage and handling designs should be arranged in consultation with a person experienced in these types of assessments.

Do not store together with: combustible material

Further information

Measures for storing in tank installations. These should include at least:

Compatible materials, adequate separation, adequate venting area, venting devices, temperature measurement, earthing (grounding), bund in case of leakage.

Prior to the first filling and operation of a tank installation all parts of the facility including all pipes must be thoroughly cleaned and flushed through.

Metal elements of the installation must first be pickled and passivated sufficiently.

For detailed information on design specifications for the construction of tank - and dosing installations ask the producer for advice.

Regularly verify the availability of water to deal with emergencies (for cooling, tank flooding, fire fighting) and check correct operation periodically.

Advice on common storage

Do not store together with: alkalis, reductants, metallic salts (risk of decomposition).

Do not store together with: inflammable substances (risk of fire).

Do not store together with: organic solvents (risk of explosion).

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8. Exposure controls/personal protection**8.1. Control parameters****Other information**

Suitable measuring processes are:

OSHA method ID 006

OSHA method VI-6

DNEL/DMEL values

End Use	Worker
Routes of exposure	Inhalation
Possible health damage	Acute - local effects
Value	3 mg/m3
End Use	Worker
Routes of exposure	Inhalation
Possible health damage	Long-term - local effects
Value	1.4 mg/m3
End Use	Consumers
Routes of exposure	Inhalation
Possible health damage	Acute - local effects
Value	1.93 mg/m3
End Use	Consumers
Routes of exposure	Inhalation
Possible health damage	Long-term - local effects
Value	0.21 mg/m3

PNEC values

Value	Freshwater 0.0126 mg/l
Value	marine water 0.0126 mg/l
Value	water - intermittent releases 0.0138 mg/l
Value	sewage treatment plant 4.66 mg/l
Value	Fresh water sediment 0.47 mg/kg (dry weight)
Value	marine water sediment 0.47 mg/kg (dry weight)
Value	soil 0.0023 mg/kg (dry weight)

8.2. Exposure controls**Engineering measures**

Ensure suitable suction/aeration at the work place and with operational machinery.
Provide for installation of emergency shower and eye bath.

Personal protective equipment

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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.

If workplace exposure limit is exceeded apply Respiratory protective equipment.

If open handling is unavoidable:

Wear respiratory protection.

If necessary: Provide with fresh air.

If necessary: Local ventilation.

When handling for a short time:

3M recommends the 3M 6003 Organic Vapor/Acid Gas Cartridge, the 3M 6006 Multi-Gas/Vapor Cartridge, and equivalent cartridges or combination versions of these be used for H₂O₂ for concentrations up to ~ 90ppm.

in the event of prolonged exposure during handling:

wear a self contained respiratory apparatus

Note time limit for wearing respiratory protective equipment.

Hand protection

Glove material butyl-rubber, for example: Butoject 898, Kächele-Cama Latex GmbH (KCL), Germany

Material thickness 0.7 mm

Break through time > 480 min

Method DIN EN 374

Glove material Natural rubber (NR), for example: Combi-Latex 395, Kächele-Cama Latex GmbH (KCL), Germany

Material thickness 1 mm

Break through time < 120 min

Method DIN EN 374

Glove material Nitrile, for example, Camatril (731), Kächele-Cama Latex GmbH (KCL), Germany

Material thickness 0.33 mm

Break through time < 30 min

Method DIN EN 374

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.

Eye protection

Use chemical splash goggles and face shield.

Skin and body protection

Wear protective clothing, acid-proof.

Suitable materials are:

PVC, neoprene, nitrile rubber (NBR), rubber.

Rubber or plastic boots

Where splashing is possible, full chemically resistant protective clothing (e.g. acid suit) and boots are required.

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.

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Hygiene measures

Do not inhale vapour, aerosols, mist.

Avoid contact with skin, eyes and clothing.

Ensure there is good room ventilation.

The work-place related airborne concentrations have to be kept below of the indicated exposure limits. If the limits at the workplace are exceeded and/or larger amounts are released (leakage, spilling, etc.) the indicated respiratory protection should be used.

No eating, drinking, smoking, or snuffing tobacco at work.

Wash face and/or hands before break and end of work.

Preventive skin protection

Avoid contaminating clothes with product.

Immediately change moistened and saturated work clothes.

Immediately rinse contaminated or saturated clothing with water.

Any contaminated protective equipment is to be cleaned after use.

Protective measures

Handle in accordance with good industrial hygiene and safety practice.

Wear suitable protective clothing, gloves and eye/face protection.

Avoid protective gloves, clothes and shoes made from the following materials:

Leather

Completely submerge hydrogen peroxide contaminated clothing or other materials in water prior to drying.

Residual hydrogen peroxide, if allowed to dry on materials such as paper, fabrics, cotton, leather, wood or other combustibles can cause the material to ignite and result in a fire.

9. Physical and chemical properties**9.1. Information on basic physical and chemical properties**

physical state	liquid
Colour	colourless, clear
Form	liquid
Odour	stinging
Odour Threshold	No data available
pH	< 2 (20 °C)
Melting point/range	-55.5 °C
Boiling point/range	> 114 - 125 °C
Flash point	Not combustible.
Evaporation rate	No data available
Flammability (solid, gas)	not flammable
Lower explosion limit	No data available
Upper explosion limit	No data available
Vapour pressure	2.99 hPa (25 °C) tested substance: hydrogen peroxide 100 %
Vapour density	No data available

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Relative vapour density	Heavier than air
Relative density	1.2364 (25 °C)
Density	1.241 g/cm ³ (20 °C)
Water solubility	miscible
Partition coefficient: n-octanol/water	log Pow: -1.57 Method: (calculated) tested substance: hydrogen peroxide 100 %
Autoignition temperature	No data available
Thermal decomposition	No data available
Viscosity, dynamic	1.90 mPa.s (0 °C)

9.2. Other information

Explosiveness	not explosive
Oxidizing properties	oxidizing
Surface tension	ca. 76.65 mN/m (20 °C)
Metal corrosion	No data available
Molecular Weight	34.02 g/Mol
Other information	strong oxidizing agent

10. Stability and reactivity**10.1. Reactivity**

No further information available

10.2. Chemical stability

No further information available

10.3. Possibility of hazardous reactions

Stability	Stable under recommended storage conditions.
Possibility of hazardous reactions	Product is a strong oxidizing agent and reactive. Commercial products are stabilised to reduce risk of decomposition due to contamination. Danger of decomposition if exposed to heat When coming in contact with the product, impurities, decomposition catalysts, incompatible substances, combustible substances, may lead to self-accelerated, exothermic decomposition and the formation of oxygen. Risk of overpressure and burst due to decomposition in confined spaces and pipes. Release of oxygen may support combustion.

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Mixtures with organic materials (e.g. solvents) can display explosive properties.

A severe detonation hazard may exist when mixed with organic liquids, e.g. kerosene or gasoline.

SPONTANEOUS COMBUSTION HAZARD: Combustible materials exposed to hydrogen peroxide should be immediately submerged in or rinsed with large amounts of water to ensure that all hydrogen peroxide is removed. Residual hydrogen peroxide that is allowed to dry (upon evaporation hydrogen peroxide can concentrate) on organic materials such as paper, fabrics, cotton, leather, wood, or other combustibles, can cause the material to ignite and result in a fire.

10.4. Conditions to avoid

sun rays, heat, heat effect

10.5. Incompatible materials

impurities, decomposition catalysts, metals, metallic salts, alkalis, hydrochloric acid, reducing agents., (Risk of decomposition).
flammable substances (Danger of fire).
organic solvents (danger of explosion)

10.6. Hazardous decomposition products

decomposition products Under conditions of thermal decomposition:
Steam, Oxygen

Under NFPA 400 - Hazardous Materials Code - 2013 Edition, Hydrogen Peroxide solutions are categorized in Appendix G as follows:

Solutions greater than 8% up to 27.5% are Class 1 Oxidizers.

Solutions greater than 27.5% up to 52% are Class 2 Oxidizers.

Solutions greater than 52% up to 91% are Class 3 Oxidizers.

No further information available

11. Toxicological information**11.1. Information on toxicological effects**

Acute oral toxicity LD50 Rat(female): 801 mg/kg
Method: OECD Test Guideline 401
Test substance: hydrogen peroxide, 60 %

LD50 rat(male): 872 mg/kg
Method: OECD Test Guideline 401
Test substance: hydrogen peroxide, 60 %

Acute dermal toxicity LD50 Rabbit: > 6500 mg/kg
Method: literature
Test substance: Hydrogen peroxide 70 %

LD50 Rabbit(male/female): > 2000 mg/kg
Method: US-EPA-method
Test substance: hydrogen peroxide, 35 %

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Skin irritation

Rabbit / 3 min
strongly corrosive
Method: literature
Test substance: Hydrogen peroxide 70 %

Rabbit / 4 h
irritating
Test substance: hydrogen peroxide, 35 %

Eye irritation

Rabbit
Risk of serious damage to eyes.
Method: literature
Test substance: hydrogen peroxide, 35 %

Rabbit
irritating
Method: OECD Test Guideline 405
Test substance: hydrogen peroxide 10 %
literature

Sensitization

Sensitization test guinea pig: not sensitizing
Method: (Magnusson-Kligman test)
literature

Repeated dose toxicity

Oral Mouse(female) / 90-day
Subsequent observation period: 6 weeks
NOEL: 37 mg/kg
target organ/effect: Changes of parameters of the blood, body weight development negative, Irritative effect:, Gastrointestinal tract
Method: OECD TG 408
Test substance: hydrogen peroxide, 35 %
drinking water analysis

Oral Mouse(male) / 90-day
Subsequent observation period: 6 weeks
NOEL: 26 mg/kg
target organ/effect: Changes of parameters of the blood, body weight development negative, Irritative effect:, Gastrointestinal tract
Method: OECD TG 408
Test substance: hydrogen peroxide, 35 %
drinking water analysis

Assessment of STOT single exposure

No data available

Assessment of STOT repeat exposure

No data available

Risk of aspiration toxicity

No data available

Gentotoxicity in vitro

Bacterial reverse mutation assay *S. typhimurium* / *E. coli*
positive and negative
Metabolic activation: with or without

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literature

chromosomal aberration mammalian cells

positive

Metabolic activation: without

Method: OECD TG 473

literature

Genetic mutation in mammal cells

positive

Metabolic activation: without

Method: OECD TG 476

literature

Gentoxicity in vivo

Micronucleus test Mouse intraperitoneal (i.p.)

negative

Method: OECD TG 474

Test substance: hydrogen peroxide, 35 %

literature

Carcinogenicity

No data available

carcinogenicity assessment

Clues to possible carcinogenic effects in animal experiments:

Up to date there is no evidence of increased tumour risk.

Hydrogen peroxide is not a carcinogenic substance according to MAK, IARC, NTP, OSHA, ACGIH.

Toxicity to reproduction

No data available

Human experience

Effect on the skin:

Causes caustic burns. With increasing contact length, local erythema or extreme irritation (whitening) up to blistering (caustic burn) can occur.

Effect on the eyes:

Extreme irritation up to cauterisation. Can cause severe conjunctivitis, cornea damage or irreversible eye damage. Symptoms may occur with delay.

Effect when swallowed:

Swallowing can lead to bleeding of the mucosa in the mouth, oesophagus and stomach.

The rapid releasing of oxygen can cause distension and bleeding of the mucosa in the stomach and lead to severe damage of the internal organs, especially in the event of greater intake of the product.

Effect when inhaled:

Inhalation of vapour/aerosols can lead to irritation of the respiratory tract and cause inflammation of the respiratory tract and pulmonary oedema. Symptoms may occur with delay.

Toxicology Assessment

Acute effects

Causes severe skin burns and eye damage.

Harmful if swallowed.

Harmful if inhaled.

May cause respiratory irritation.

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Sensitization	Due to the data available, the classification criteria for all further toxicological end points are not fulfilled
Repeated dose toxicity	Due to the data available, the classification criteria for all further toxicological end points are not fulfilled
CMR assessment	
Mutagenicity	The classification criteria are not met based on the available data.

12. Ecological information**12.1. Toxicity**

Toxicity to fish	LC50 semi-static test Pimephales promelas: 16.4 mg/l / 96 h Test substance: hydrogen peroxide 100 %
Toxicity in aquatic invertebrates	EC50 semi-static test Daphnia pulex: 2.4 mg/l / 48 h Test substance: hydrogen peroxide 100 %
Toxicity to algae	NOEC static test Skeletonema costatum: 0.63 mg/l / 72 h End point: growth rate Test substance: hydrogen peroxide 100 %
Toxicity to bacteria	EC50 static test Activated sludge: 466 mg/l / 30 min Test substance: hydrogen peroxide 100 % Method: OECD TG 209 EC50 static test Activated sludge: > 1000 mg/l / 3 h Test substance: hydrogen peroxide 100 % Method: OECD TG 209
chronic toxicity in daphnia	NOEC flow-through test Daphnia magna: 0.63 mg/l / 21 d Test substance: hydrogen peroxide 100 % literature

12.2. Persistence and degradability

photo-decomposition	50 % degradation within approx. 20 hours; medium: air
Biodegradability	Result: Readily biodegradable Test substance: hydrogen peroxide 100 % Semiquantitative measurement of concentration over time.
AOX	The product does not contain any organically bonded halogen.
Further Information	Under ambient conditions quick hydrolysis, Reduction or decomposition occurs. The following substances are formed: oxygen and water.

12.3. Bioaccumulative potential

Bioaccumulation	None. Hydrogen peroxide quickly decomposes to oxygen and water.
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12.4. Mobility in soil

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Mobility No data available

12.5. Other adverse effects**Ecotoxicology Assessment**

Acute aquatic toxicity	The classification criteria are not met based on the available data.
Chronic aquatic toxicity	Based on the data on file, the substance must be considered aquatotoxic (chronic).

13. Disposal considerations**13.1. Waste treatment methods****Product**

Disposal according to local authority regulations.

If necessary:

Because of recycling/disposal contact the relevant authorities.

Offer surplus and non-recyclable solutions to a licensed disposal company. **Product**

With small amounts:

May be disposed of as sewage water in accordance with local legal regulations by previously diluting with plenty of water. (drainage systems, sewage treatment plant **Product**

The appropriate regulatory agencies should be contacted prior to disposal.

A possible method of disposal is to dilute with large amounts of water to a concentration of about 5% hydrogen peroxide; hold in diked area or pond until peroxide is completely decomposed or dispose of according to all relevant local, provincial, state, and federal laws and regulations. Use personal protective equipment as described in section 8. Do not contaminate any lakes, streams, ponds, groundwater or soil. If necessary, contact supplier for recommendations to decompose dilute peroxide (5%)

Uncleaned packaging

Rinse empty containers before disposal; recommended cleaning agent: water.

Offer rinsed packaging material to local recycling facilities.

Do not reuse empty containers and dispose of in accordance with the regulations issued by the appropriate local authorities. Dispose of containers that have not been emptied completely and/or cleaned like of substance.

14. Transport information**D.O.T. Road/Rail**

14.1. UN number:	UN 2014
14.2. UN proper shipping name:	Hydrogen peroxide, aqueous solutions
14.3. Transport hazard class(es):	5.1 (8)
14.4. Packing group:	II
14.5. Environmental hazards (Marine pollutant):	--
14.6. Special precautions for user:	Yes
RAIL:	DOT-SP 14532 allows visual examination without removal of the rupture disc. This special
(CFR)	approval applies on tank car shipments only

Air transport ICAO-TI/IATA-DGR

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- 14.1. UN number: UN 2014
14.2. UN proper shipping name: Hydrogen peroxide, aqueous solution
14.3. Transport hazard class(es): 5.1 (8)
14.4. Packing group: II
14.5. Environmental hazards: --
14.6. Special precautions for user: Yes
IATA-C: ERG-Code 5C
IATA-P: ERG-Code 5C

Sea transport IMDG-Code/GGVSee (Germany)

- 14.1. UN number: UN 2014
14.2. UN proper shipping name: HYDROGEN PEROXIDE, AQUEOUS SOLUTION
14.3. Transport hazard class(es): 5.1 (8)
14.4. Packing group: II
14.5. Environmental hazards (Marine pollutant): --
14.6. Special precautions for user: Yes
EmS: F-H,S-Q
Protect from heat. On deck only. Product-specific regulations on storing substances separately.
"Separated from" permanganates and class 4.1.
14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:
for transport approval 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
- Reactivity Hazard

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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**California Proposition 65**

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

- None listed

International Chemical Inventory Status

Unless otherwise noted, this product is in compliance with the inventory listing of the countries shown below. For information on listing for countries not shown, contact the Product Regulatory Services Department.

Europe (EINECS/ELINCS)	listed/registered
USA (TSCA)	listed/registered
Canada (DSL)	listed/registered
Australia (AICS)	listed/registered
Japan (MITI)	listed/registered
Korea (TCCL)	listed/registered
Philippines (PICCS)	listed/registered
China	listed/registered
New Zealand	listed/registered

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 :	3
Flammability :	0
Physical Hazard :	1

NFPA Ratings

Health :	3
Flammability :	0
Reactivity :	1

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16. Other information**Further information**

Further information

Data for the production of the safety data sheet from the studies available and from the literature.

Further information about the characteristics of the product can be found in the product code of practice or in the Product-Brochure .

Revision date

05/21/2015

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 Hygienists
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(EC50)	LC50 or EC50
LOAEL	Low est observed adverse effect level
LOEL	Low est 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

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