1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product information

Trade name : PERACLEAN® 5
Use of the Substance / Preparation : For industrial use
Function : Water treatment
Company : Degussa Corporation
            379 Interpace Parkway
            Parsippany, NJ 07054
            USA
Telephone : 973-541-8000
Telefax : 973-541-8040
US: CHEMTREC EMERGENCY NUMBER : 800-424-9300
CANADA: CANUTEC EMERGENCY NUMBER : 613-996-6666
Product Regulatory Services : 973-541-8060

2. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature
Preparation of perethanoic acid, hydrogen peroxide, ethanoic acid and water in balance.

Information on ingredients / Hazardous components

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS-No.</th>
<th>Percent (Wt./ Wt.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peracetic acid</td>
<td>79-21-0</td>
<td>5 %</td>
</tr>
<tr>
<td>Hydrogen peroxide</td>
<td>7722-84-1</td>
<td>20 - &lt; 30 %</td>
</tr>
<tr>
<td>Acetic acid</td>
<td>64-19-7</td>
<td>6 - &lt; 10 %</td>
</tr>
</tbody>
</table>

Other information
This material is classified as hazardous under OSHA regulations.
3. HAZARDS IDENTIFICATION

*** EMERGENCY OVERVIEW ***

Form: liquid  Color: colourless, clear  Odor: stinging

Contact with combustible material may cause fire. Harmful by inhalation, in contact with skin and if swallowed. Causes burns.

Eye contact
Corrosive. May cause burns resulting in permanent damage.

Skin Contact
Corrosive. May cause burns resulting in permanent damage.

Inhalation
Inhalation of vapors can cause severe irritation and damage to nose, throat and lungs.

Ingestion
Causes digestive tract burns.

4. FIRST AID MEASURES

General advice
Move out of dangerous area. Take care of your own personal safety. see section 8.

Inhalation
Take affected persons out into the fresh air. Possible discomfort: Irritates skin and mucous linings of the eyes and respiratory tract. Cough.

If breathing difficulties occur (e.g. severe continual coughing):
Keep patient half sitting with upper body raised.
Keep warm and in a quiet place.
Call a physician immediately.

Skin contact
After contact with skin, wash immediately with plenty of water.
Consult a physician.
Take off immediately all contaminated clothing.

Eye contact
With eye held open, thoroughly rinse immediately with plenty of water for at least 10 minutes. Protect unharmed eye.
Continue rinsing process with eye rinsing solution.
Call ambulance. (Cue: caustic burn of the eyes)
Immediate further treatment in ophthalmic hospital/ophthalmologist.
Continue rinsing eye until arrival at ophthalmic hospital.

**Ingestion**

Do not induce vomiting.

Danger of penetration of the lungs (danger to breathing) when swallowed or vomited, due to gas evolution and foam formation.

Only when patient fully conscious:

Have the mouth rinsed with water.

Have patient drink plenty of water in small sips.

Keep patient warm and at rest.

Notify ambulance immediately (keyword: acid burn).

**Notes to physician**

Therapy as for chemical burn.

Following inhalation:

Formation of a toxic lung edema is possible if product continues to be inhaled despite acute irritative effect (e.g. if it is not possible to leave the danger area).

Prophylaxis of a toxic lung oedema with inhalative steroids (Dexamethasone aerosol dosing spray, f.ex. auxilosone).

If substance has been swallowed:

Aspiration hazard!

Risk of gaseous embolisms!

In case of excessive strain on the stomach due to gas evolution, insert siphon tube.

Early endoscopy in order to assess mucosa lesions in the oesophagus and stomach which may appear.

If necessary, suck away leftover substance.

Do not administer activated charcoal, since risk of release of large amounts of gas from hydrogen peroxide!

### 5. FIRE-FIGHTING MEASURES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash point</td>
<td>not measureable (formation of foam)</td>
</tr>
<tr>
<td>Method</td>
<td>ISO 2719</td>
</tr>
<tr>
<td>Lower explosion limit</td>
<td>no data available</td>
</tr>
<tr>
<td>Upper explosion limit</td>
<td>no data available</td>
</tr>
<tr>
<td>Autoignition temperature</td>
<td>395 °C</td>
</tr>
<tr>
<td>Method</td>
<td>DIN 51 794</td>
</tr>
</tbody>
</table>

**Suitable extinguishing media**

- water spray foam dry powder carbon dioxide (CO2)

**Extinguishing media which must not be used for safety reasons**

- organic compounds

**Specific hazards during fire fighting**

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

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.
In case of fire, remove the endangered containers and bring to a safe place, if this can be done safely. Keep away from heat. If necessary: In the case of fire, cool the containers that are at risk with water or dilute with water (flooding).

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

Further information
Evacuate personnel to safe areas. Keep out unprotected persons. Keep unauthorised persons away. Water used to extinguish fire should not enter drainage systems, soil or stretches of water. Ensure there are sufficient retaining facilities for water used to extinguish fire. Contaminated fire-extinguishing water must be disposed of in accordance with the regulations issued by the appropriate local authorities. Fire residues should be disposed of in accordance with the regulations.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Product causes chemical burns. Wear personal protective equipment; see section 8. Evacuate personnel to safe areas. Keep out unprotected persons. Keep unauthorised persons away.

Environmental precautions
Observe regulations on prevention of water pollution (collect, dam up, cover up). Do not allow to run into water channels, surface water, or into the ground.

Methods for cleaning up
Keep away from incompatible substances. Keep away from flammable substances. see section 10. Clean contaminated surface thoroughly. Recommended cleaning agent: water. Dispose of absorbed material in accordance with the regulations. see section 13. With small amounts: Dilute product with lots of water and rinse away. see section 12. or Absorb with liquid-binding material, e. g.: chemisorption, diatomaceous earth, universal binder Do not use: textiles, saw dust, combustible substances. Pick up mechanically. Collect in suitable containers.
Additional advice
Make safe or remove all sources of ignition.
Isolate defective containers immediately, if possible and safe to do.
Shut off leak, 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).

Product taken out should not be returned into container.
Never return spilled product into its original container for re-use. (Risk of decomposition.)

7. HANDLING AND STORAGE

Handling
Safe handling advice
Avoid contact with skin, eyes and clothing.
Do not breathe in vapours, aerosols, sprays.
For personal protection see section 8.

Handle in accordance with good industrial hygiene and safety practices.
Avoid impurities and heat effect.
Ensure there is good room ventilation.
Immediately change moistened and saturated work clothes.
Immediately rinse contaminated or saturated clothing with water.
Never return spilled product into its original container for re-use. (Risk of decomposition.)

Provide for installation of emergency shower and eye bath.
Set up safety and operation procedures.

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.
see section 10.

To cool, spray closed containers with water spray jet. In case of fire, remove the endangered containers and bring to a safe place, if this can be done safely.
see section 5.

Storage
Requirements for storage areas and containers
cool, well ventilated, clean, lockable.
Recommendation: Acid-proof floor.
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.
Check containers and tanks at regular intervals to detect any special changes such as pressure build-up (distension), damage, leakage.
Transport and store container in upright position only.
Do not empty container by means of pressure.
Always close container tightly after removal of product.
Do not keep the container sealed.
Ensure tightness at all times. Avoid leakage.
Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Only use containers which are specially permitted for: Peracetic acid.
and/or
For transport, storage and tank installations only use suitable materials.
Suitable materials: stainless steel (1.4571)
Suitable materials: polyethylene, polypropylene, polyvinyl chloride (PVC),
Suitable materials: polytetrafluoroethylene, glass, ceramics.
Unsuitable materials: mild steel, iron, copper, brass, Bronze, aluminium, zinc.

Further information
Avoid sun rays, heat, heat effect.
Avoid impurities.
see also section 15.
Regularly verify the availability of water to deal with emergencies (for cooling, tank flooding, fire fighting) and check correct operation periodically.
For detailed information on design specifications for the construction of tank- and dosing installations ask the producer for advice.

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).

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Component occupational exposure guidelines

- Hydrogen peroxide
  CAS-No. 7722-84-1
  Control parameters
  • 1 ppm
  • 1 ppm
  • 1.4 mg/m³
  • 1.4 mg/m³ as H₂O₂
  Time Weighted Average (TWA): (ACGIH)
  Permissible Exposure Limit (PEL): (OSHA Z1)

- Acetic acid
  CAS-No. 64-19-7
  Control parameters
  • 10 ppm
  • 15 ppm
  • 10 ppm
  • 25 mg/m³
  • 25 mg/m³
  • 40 ppm
  • 15 ppm
  • 37 mg/m³
  Time Weighted Average (TWA): (ACGIH)
  Short Term Exposure Limit (STEL): (ACGIH)
  Permissible Exposure Limit (PEL): (OSHA Z1)
  Ceiling Limit Value: (US CA OEL)
  Short Term Exposure Limit (STEL): (US CA OEL)
Other information
Suitable measuring processes are:
Hydrogen peroxide
OSHA method ID 006
OSHA method VI-6
Acetic acid
NIOSH method 1603
OSHA method ID 186

Engineering measures
Ensure suitable suction/aeration at the work place and with operational machinery. see also section 7.

Personal protective equipment

Respiratory protection
Do not inhale vapour, aerosols, mist.
If workplace exposure limit is exceeded apply Respiratory protective equipment.
wear a self contained respiratory apparatus
If necessary: Local ventilation.
A respiratory protection program that meets OSHA 1910.134 and ANSI Z88.2 or applicable federal/provincial requirements must be followed whenever workplace conditions warrant respirator use.
NIOSH's "Respirator Decision Logic" may be useful in determining the suitability of various types of respirators.

Hand protection
Polychloroprene (PCP)

Eye protection
wear basket-shaped glasses

Skin and body protection
Wear protective clothing, acid-proof.
Suitable materials are:
PVC, neoprene, nitrile rubber (NBR), rubber.
Rubber or plastic boots.

Hygiene measures
Avoid contact with skin, eyes and clothing.
Do not inhale vapour, aerosols, mist.
Ensure there is good room ventilation.
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 practices.
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, dust) the indicated respiratory protection should be used.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appearance</strong></td>
<td></td>
</tr>
<tr>
<td>Form</td>
<td>liquid</td>
</tr>
<tr>
<td>Color</td>
<td>colourless, clear</td>
</tr>
<tr>
<td>Odor</td>
<td>stinging</td>
</tr>
<tr>
<td><strong>Safety data</strong></td>
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</tr>
<tr>
<td>pH</td>
<td>ca. 0.6 20°C</td>
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<tr>
<td>Medium</td>
<td>Product</td>
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<tr>
<td>Melting point/range</td>
<td>ca. -28 °C</td>
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<tr>
<td>Boiling point/range</td>
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<tr>
<td></td>
<td>&gt; 60 °C</td>
</tr>
<tr>
<td>Flash point</td>
<td>Method ISO 2719</td>
</tr>
<tr>
<td></td>
<td>not measureable (formation of foam)</td>
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<tr>
<td></td>
<td>Method DIN 51 794</td>
</tr>
<tr>
<td>Autoinflammability</td>
<td>not spontaneously flammable</td>
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<tr>
<td>Lower explosion limit</td>
<td>no data available</td>
</tr>
<tr>
<td>Upper explosion limit</td>
<td>no data available</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>ca. 27 hPa 20°C</td>
</tr>
<tr>
<td>Density</td>
<td>ca. 1.12 g/cm³ 20°C</td>
</tr>
<tr>
<td>Bulk density</td>
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<tr>
<td>Water solubility</td>
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<tr>
<td>Partition coefficient (n-octanol/water)</td>
<td>log Pow -1.25 (calculated)</td>
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<tr>
<td>Viscosity, dynamic</td>
<td>not determined</td>
</tr>
<tr>
<td><strong>Further information</strong></td>
<td></td>
</tr>
<tr>
<td>Miscibility in water</td>
<td>completely miscible</td>
</tr>
<tr>
<td>Other information</td>
<td>oxidising agent</td>
</tr>
</tbody>
</table>
10. STABILITY AND REACTIVITY

Conditions to avoid:
- sun rays, heat, heat effect

Materials to avoid:
- Impurities, decomposition catalysts, metal salts, alkalis, reducing substances, metals, nonferrous heavy metals, aluminium, zinc. Possible hazardous reaction: decomposition.
- Flammable materials, Possible hazardous reaction: Spontaneous ignition.
- Organic solvents, Possible hazardous reaction: Danger of explosion.

Hazardous decomposition products:
- Decomposition products Under conditions of thermal decomposition: steam, oxygen

Hazardous reactions:
- Product is a(n) oxidizing agent and reactive. Stable under recommended storage conditions. Product is supplied in stabilised form.
- Danger of decomposition if exposed to heat
- When coming in contact with the product, impurities, decomposition catalysts, metallic salts, alkalis, reducing agents 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.

11. TOXICOLOGICAL INFORMATION

Product Acute oral toxicity:
- LD50 Rat(female): 1859 mg/kg
  - Method: literature
  - Test substance: Peracetic acid 5%

Product Acute inhalation toxicity:
- Approximate lethal concentration Rat: 0.49 mg/l Vapour as peracetic acid

Product Acute dermal toxicity:
- LD50 rat(male/female): 1147 mg/kg
  - Method: literature
  - Test substance: Peracetic acid 5%

Product Skin irritation:
- Rabbit / 0.75 h corrosive
  - Method: OECD Test Guideline 404
  - Test substance: Peracetic acid 5%

Product Eye irritation:
- Rabbit corrosive
MATERIAL SAFETY DATA SHEET
PERACLEAN® 5

Method literature
Test substance Peracetic acid 5 %

Product Sensitization
Buehler Test guinea pig: negative
Method literature
Test substance Peracetic acid 5 %

Product Gentoxicity in vitro
Ames test
predominantly negative
(literature value)

Unscheduled DNA synthesis -test (UDS)
negative
(literature value)

chromosomal aberration V 79 cells
negative
Method OECD TG 473

HGPRT-Test V 79 cells
negative
Method OECD TG 476

Product Gentoxicity in vivo
Micronucleus test mouse Oral
negative
Method literature

Unscheduled DNA synthesis -test (UDS) Rat Oral
negative
Method literature

Product Human experience
Caustic / irritant effect on skin, eyes and mucous membranes (respiratory tract)
Also in dilute solutions
Onset of effects within seconds or minutes depending on the concentration.

12. ECOLOGICAL INFORMATION

Elimination information (persistence and degradability)
Biodegradability
Readily biodegradable
Exposure time: 28 d
Method: OECD TG 301 E
At non-bacteriotoxic concentrations

Physico-chemical removability
Hydrolyzes after 7 days by approx. 50 %.
PH 4
Further Information

Hydrolyzes after 1 day to approx. 50\%. pH 7 and pH 9

Under ambient conditions quick hydrolysis, Reduction or decomposition occurs. The following substances are formed: oxygen, water, acetic acid. Acetic acid is easily biodegradable

Bioaccumulation: low

log Pow: see chapter 9

Ecotoxicity effects

Toxicity to fish

LC50 Pleuronectes platessa: 11 mg/l / 96 h
Method: literature
As peracetic acid

LC50 Oncorhynchus mykiss: 1 - 2 mg/l / 96 h
Method: literature
As peracetic acid

Toxicity to daphnia

EC50 Daphnia magna: 0.5 - 1.1 mg/l / 48 h
Method: OECD TG 202
As peracetic acid
(literature value)

Toxicity to algae

IC 50 Selenastrum capricornutum: ca. 0.18 mg/l / 120 h
Method: US-EPA-method chronic
As peracetic acid
(literature value)

Toxicity to bacteria

EC50 Activated sludge: 5.1 mg/l / 3 h
Method: OECD TG 209
As peracetic acid

NOEC Daphnia magna: 0.05 mg/l / 21 d
Method: OECD 211
As peracetic acid

Further information on ecology

AOX
The product does not contain any organically bonded halogen.

General Ecological Information
does not contain any heavy metals and compounds from EC directive 76/464:

e.g. arsenic-, lead
cadmium
Mercury
13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL
Advice on disposal

Waste must be disposed of in accordance with local, state, provincial and federal laws and regulations. Empty containers must be handled with care due to product residue.

14. TRANSPORT INFORMATION

D.O.T. Road/Rail

<table>
<thead>
<tr>
<th>Class</th>
<th>5.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN-No</td>
<td>3149</td>
</tr>
<tr>
<td>Packing group</td>
<td>II</td>
</tr>
<tr>
<td>Subsidiary risk</td>
<td>8</td>
</tr>
<tr>
<td>Proper shipping name</td>
<td>Hydrogen peroxide and peroxyacetic acid mixtures, stabilized</td>
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</tbody>
</table>

Sea transport IMDG-Code

<table>
<thead>
<tr>
<th>Class</th>
<th>5.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN-No</td>
<td>3149</td>
</tr>
<tr>
<td>Packaging group</td>
<td>II</td>
</tr>
<tr>
<td>Subsidiary risk</td>
<td>8</td>
</tr>
<tr>
<td>EmS</td>
<td>F-H, S-Q</td>
</tr>
<tr>
<td>Proper technical name (Proper shipping name)</td>
<td>HYDROGEN PEROXIDE AND PEROXYACETIC ACID MIXTURE, STABILIZED</td>
</tr>
</tbody>
</table>

Air transport ICAO-TI/IATA-DGR

<table>
<thead>
<tr>
<th>Class</th>
<th>5.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN-No</td>
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</tr>
<tr>
<td>Proper technical name (Proper shipping name)</td>
<td>Hydrogen peroxide and peroxyacetic acid mixture, stabilized</td>
</tr>
</tbody>
</table>

Loading instructions/Remarks

IATA_C | ERG-Code 5C |
IATA_P | ERG-Code 5C |
IMDG | Protect from heat. Separate from metal powders and permanganates. |
IMDG | "Separated from" permanganates and class 4.1. |

Transport/further information

Protect from thermal radiation.
15. REGULATORY INFORMATION

Information on ingredients / Non-hazardous components

This product contains the following non-hazardous components:

- Water
  - CAS-No. 7732-18-5
  - Percent (Wt./Wt.) 61%

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:

- Acetic acid
  - CAS-No. 64-19-7
  - Reportable Quantity 73529 lbs

SARA Title III Section 311/312 Hazard Categories

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

- Acute Health Hazard

SARA Title III Section 313 Reportable Substances

If listed below, components are subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

- None listed

Toxic Substances Control Act (TSCA)

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

- None listed
State Regulations

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 Degussa Corporation Product Regulatory Department:

- Europe (EINECS/ELINCS) Listed/registered
- USA (TSCA) Listed/registered
- Canada (DSL) Listed/registered
- Australia (AICS) Listed/registered
- Japan (MITI) Listed/registered
- Korea (TCCL) Not listed/Not registered
- Philippines (PICCS) Listed/registered
- China Listed/registered

16. OTHER INFORMATION

HMIS Ratings

Health: 3
Flammability: 1
Physical Hazard: 1

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.

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

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

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.