



<b>Response</b>	If swallowed: Rinse mouth. Do NOT induce vomiting. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. If inhaled: Remove person to fresh air and keep comfortable for breathing. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If exposed or concerned: Get medical advice/attention. In case of fire: Use water for extinction.		
<b>Storage</b>	Store locked up.		
<b>Disposal</b>	Dispose of contents/container to an approved waste disposal plant.		
<b>Hazard(s) not otherwise classified (HNOC)</b>	Not classified.		
<b>Environmental hazards</b>	Hazardous to the aquatic environment, acute hazard Category 1 Hazardous to the aquatic environment, long-term hazard Category 1		
<b>Supplemental information</b>			
<b>Precautionary statement</b>			
<b>Prevention</b>	Avoid release to the environment.		
<b>Response</b>	Collect spillage.		
<b>Disposal</b>	Dispose of contents/container in accordance with local/regional/national/international regulations.		

### 3. Composition/information on ingredients

#### Substances

<b>Hazardous components</b>	<b>Chemical name</b>	<b>Common name and synonyms</b>	<b>CAS number</b>	<b>%</b>
NICKEL PERCHLORATE, HEXAHYDRATE			13520-61-1	100
*Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.				
<b>Composition comments</b>	Occupational Exposure Limits for constituents are listed in Section 8.			
<b>4. First-aid measures</b>				
<b>Inhalation</b>	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Oxygen or artificial respiration if needed. Do not use mouth-to-mouth method if victim inhaled the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Call a physician or poison control center immediately.			
<b>Skin contact</b>	Take off immediately all contaminated clothing. Wash off with soap and plenty of water. Call a physician or poison control center immediately. For minor skin contact, avoid spreading material on unaffected skin. Get medical attention if irritation develops and persists. If skin irritation or rash occurs: Get medical advice/attention.			
<b>Eye contact</b>	Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a physician or poison control center immediately.			
<b>Ingestion</b>	Call a physician or poison control center immediately. Rinse mouth. Do not induce vomiting. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.			
<b>Most important symptoms/effects, acute and delayed</b>	Corrosive effects. Irritation of eyes and mucous membranes. May cause temporary blindness and severe eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. May cause allergic skin reaction. May cause allergic respiratory reaction. Prolonged exposure may cause chronic effects.			
<b>Indication of immediate medical attention and special treatment needed</b>	In case of shortness of breath, give oxygen. Keep victim warm. Keep victim under observation. Symptoms may be delayed. Provide general supportive measures and treat symptomatically.			
<b>General information</b>	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. IF exposed or concerned: Get medical advice/attention. Wash contaminated clothing before reuse.			
<b>5. Fire-fighting measures</b>				
<b>Suitable extinguishing media</b>	Water.			
<b>Unsuitable extinguishing media</b>	None known.			
<b>Specific hazards arising from the chemical</b>	May intensify fire; oxidizer.			

<b>Special protective equipment and precautions for firefighters</b>	Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA.
<b>Fire-fighting equipment/instructions</b>	Move containers from fire area if you can do so without risk. In the event of fire, cool tanks with water spray. For massive fire in cargo area, use unmanned hose holder or monitor nozzles, if possible. If not, withdraw and let fire burn out. Water runoff can cause environmental damage.
<b>Specific methods</b>	Cool containers exposed to flames with water until well after the fire is out.

## 6. Accidental release measures

<b>Personal precautions, protective equipment and emergency procedures</b>	Keep unnecessary personnel away. Local authorities should be advised if significant spillages cannot be contained. Wear appropriate protective equipment and clothing during clean-up. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Keep people away from and upwind of spill/leak. Keep upwind. Keep out of low areas. Ventilate closed spaces before entering them. Wear appropriate personal protective equipment.
<b>Methods and materials for containment and cleaning up</b>	Keep combustibles (wood, paper, oil, etc.) away from spilled material. This product is miscible in water. Stop the flow of material, if this is without risk. Collect spillage. Following product recovery, flush area with water. This material is classified as a water pollutant under the Clean Water Act and should be prevented from contaminating soil or from entering sewage and drainage systems which lead to waterways. For waste disposal, see section 13 of the MSDS.
<b>Environmental precautions</b>	Contact local authorities in case of spillage to drain/aquatic environment. Avoid discharge into drains, water courses or onto the ground. Avoid release to the environment. Prevent further leakage or spillage if safe to do so. Do not contaminate water.

## 7. Handling and storage

<b>Precautions for safe handling</b>	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Take any precaution to avoid mixing with combustibles. Keep away from heat. Do not get this material in contact with eyes. Do not get this material in contact with skin. Avoid contact during pregnancy/while nursing. Do not get this material on clothing. Use personal protective equipment as required. Avoid prolonged exposure. When using, do not eat, drink or smoke. Wash hands thoroughly after handling. Avoid release to the environment. Do not empty into drains.
<b>Conditions for safe storage, including any incompatibilities</b>	Store locked up. Keep away from heat. Store in a well-ventilated place. Keep container tightly closed. Do not store near combustible materials. Keep out of the reach of children. Store in a cool, dry place out of direct sunlight.

## 8. Exposure controls/personal protection

### Occupational exposure limits

#### US. NIOSH: Pocket Guide to Chemical Hazards

Material	Type	Value
NICKEL PERCHLORATE, HEXAHYDRATE (CAS 13520-61-1)	TWA	0.015 mg/m <sup>3</sup>

### Biological limit values

No biological exposure limits noted for the ingredient(s).

### Appropriate engineering controls

Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Provide eyewash station.

### Individual protection measures, such as personal protective equipment

#### Eye/face protection

Wear eye/face protection.

#### Skin protection

Wear protective gloves.

#### Hand protection

Wear appropriate chemical resistant clothing. It may provide little or no thermal protection. Wear protective gloves.

#### Other

When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

#### Respiratory protection

Not available.

#### Thermal hazards

When using, do not eat, drink or smoke. Do not get in eyes. Do not get this material in contact with skin. Do not get this material on clothing. Wash hands before breaks and immediately after handling the product. Contaminated work clothing should not be allowed out of the workplace. Handle in accordance with good industrial hygiene and safety practice.

## **9. Physical and chemical properties**

<b>Appearance</b>	Damp crystals.
<b>Physical state</b>	Solid.
<b>Form</b>	Solid.
<b>Color</b>	Green.
<b>Odor</b>	Odorless.
<b>Odor threshold</b>	Not available.
<b>pH</b>	Not available.
<b>Melting point/freezing point</b>	284 °F (140 °C) Approximately
<b>Initial boiling point and boiling range</b>	Not available.
<b>Flash point</b>	Not available.
<b>Evaporation rate</b>	Not available.
<b>Flammability (solid, gas)</b>	Not applicable.
<b>Upper/lower flammability or explosive limits</b>	
<b>Flammability limit - lower (%)</b>	Not available.
<b>Flammability limit - upper (%)</b>	Not available.
<b>Explosive limit - lower (%)</b>	Not available.
<b>Explosive limit - upper (%)</b>	Not available.
<b>Vapor density</b>	Not available.
<b>Relative density</b>	Not available.
<b>Solubility(ies)</b>	very soluble
<b>Partition coefficient (n-octanol/water)</b>	Not available.
<b>Auto-ignition temperature</b>	Not available.
<b>Decomposition temperature</b>	Not available.
<b>Viscosity</b>	Not available.
<b>Other information</b>	
<b>Molecular formula</b>	Ni(ClO <sub>4</sub> ) <sub>2</sub> ·6H <sub>2</sub> O
<b>Molecular weight</b>	365.70
<b>pH in aqueous solution</b>	1 - 5 (5% aqueous solution)

## **10. Stability and reactivity**

<b>Reactivity</b>	Combustible material.
<b>Chemical stability</b>	The substance is hygroscopic and will absorb water by contact with the moisture in the air. Material is stable under normal conditions.
<b>Possibility of hazardous reactions</b>	Hazardous polymerization does not occur.
<b>Conditions to avoid</b>	The substance is hygroscopic and will absorb water by contact with the moisture in the air. Excessive heat.
<b>Incompatible materials</b>	Combustible material. Organic materials
<b>Hazardous decomposition products</b>	Toxic gas.

## **11. Toxicological information**

### **Information on likely routes of exposure**

<b>Ingestion</b>	Causes digestive tract burns.
<b>Inhalation</b>	May cause irritation to the respiratory system. May cause allergy or asthma symptoms or breathing difficulties if inhaled.
<b>Skin contact</b>	Causes severe skin burns. May cause an allergic skin reaction.
<b>Eye contact</b>	Causes severe eye burns. Causes serious eye damage.

**Symptoms related to the physical, chemical and toxicological characteristics**

**Information on toxicological effects**

**Acute toxicity**

Causes severe skin burns and eye damage.

**Skin corrosion/irritation**

Causes severe skin burns and eye damage.

**Serious eye damage/eye irritation**

Causes severe eye burns. Causes serious eye damage.

**Respiratory sensitization**

May cause allergy or asthma symptoms or breathing difficulties if inhaled.

**Skin sensitization**

May cause an allergic skin reaction.

**Germ cell mutagenicity**

Suspected of causing genetic defects.

**Carcinogenicity**

Cancer hazard.

**IARC Monographs. Overall Evaluation of Carcinogenicity**

NICKEL PERCHLORATE, HEXAHYDRATE (CAS 13520-61-1)

1 Carcinogenic to humans.

**NTP Report on Carcinogens**

NICKEL PERCHLORATE, HEXAHYDRATE (CAS 13520-61-1)

**Reproductive toxicity**

May damage the unborn child.

**Specific target organ toxicity - single exposure**

Due to lack of data the classification is not possible.

**Specific target organ toxicity - repeated exposure**

Causes damage to organs through prolonged or repeated exposure. The perchlorate ion competes with iodide in the mechanism that governs uptake into the thyroid gland for growth hormone production. This effect is routinely countered by ensuring sufficient dietary intake of iodine, as perchlorate does not accumulate in the body. Studies on workers in plants where perchlorates are manufactured have shown no thyroid abnormalities; various clinical studies are ongoing. Perchlorates occur naturally in trace amounts in the environment, and are not classified as carcinogenic.

**Aspiration hazard**

Due to lack of data the classification is not possible.

**Chronic effects**

Prolonged inhalation may be harmful. Prolonged exposure may cause chronic effects. Causes damage to organs through prolonged or repeated exposure.

## 12. Ecological information

**Ecotoxicity**

Very toxic to aquatic life with long lasting effects. Accumulation in aquatic organisms is expected.

**Persistence and degradability**

No data is available on the degradability of this product.

**Bioaccumulative potential**

Not available.

**Mobility in soil**

Not available.

**Other adverse effects**

Not available.

## 13. Disposal considerations

**Disposal instructions**

Collect and reclaim or dispose in sealed containers at licensed waste disposal site. This material and its container must be disposed of as hazardous waste. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. If discarded, this product is considered a RCRA ignitable waste, D001. Dispose of contents/container in accordance with local/regional/national/international regulations.

**Local disposal regulations**

Not available.

**Hazardous waste code**

D001: Waste Flammable material with a flash point <140 F

D002: Waste Corrosive material [pH <=2 or =>12.5, or corrosive to steel]

**Waste from residues / unused products**

Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

**Contaminated packaging**

Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

## 14. Transport information

**DOT**

**UN number** UN1481

**UN proper shipping name** Perchlorates, inorganic, n.o.s., MARINE POLLUTANT

**Transport hazard class(es)** 5.1

**Subsidiary class(es)** Not available.

<b>Packing group</b>	II
<b>Special precautions for user</b>	Read safety instructions, SDS and emergency procedures before handling.
<b>Labels required</b>	5.1
<b>Special provisions</b>	IB6, IP2, T3, TP33
<b>Packaging exceptions</b>	152
<b>Packaging non bulk</b>	212
<b>Packaging bulk</b>	242

#### IATA

<b>UN number</b>	UN1481
<b>UN proper shipping name</b>	Perchlorates, inorganic, n.o.s.
<b>Transport hazard class(es)</b>	5.1
<b>Subsidiary class(es)</b>	-
<b>Packaging group</b>	II
<b>Environmental hazards</b>	No
<b>Labels required</b>	Not available.
<b>ERG Code</b>	5L
<b>Special precautions for user</b>	Not available.

#### IMDG

<b>UN number</b>	UN1481
<b>UN proper shipping name</b>	PERCHLORATES, INORGANIC, N.O.S., MARINE POLLUTANT
<b>Transport hazard class(es)</b>	5.1
<b>Subsidiary class(es)</b>	•
<b>Packaging group</b>	II
<b>Environmental hazards</b>	
<b>Marine pollutant</b>	Yes
<b>Labels required</b>	Not available.
<b>EmS</b>	F-H, S-Q
<b>Special precautions for user</b>	Not available.

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

#### General information

#### DOT



#### IATA



## Marine pollutant



## 15. Regulatory information

**US federal regulations** CERCLA/SARA Hazardous Substances - Not applicable.

All components are on the U.S. EPA TSCA Inventory List.

### TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

### US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not on regulatory list.

### CERCLA Hazardous Substance List (40 CFR 302.4)

NICKEL PERCHLORATE, HEXAHYDRATE (CAS 13520-61-1) LISTED

### Superfund Amendments and Reauthorization Act of 1986 (SARA)

**Hazard categories**  
Immediate Hazard - Yes  
Delayed Hazard - Yes  
Fire Hazard - Yes  
Pressure Hazard - No  
Reactivity Hazard - No

**SARA 302 Extremely hazardous substance** No

**SARA 311/312 Hazardous chemical** No

### Other federal regulations

#### Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

NICKEL PERCHLORATE, HEXAHYDRATE (CAS 13520-61-1)

#### Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

**Clean Water Act (CWA) Section 112(r) (40 CFR 68.130)**  
Priority pollutant  
Toxic pollutant

**Safe Drinking Water Act (SDWA)** Monitoring

#### Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR 1310.02(b) and 1310.04(f)(2) and Chemical Code Number

Not listed.

#### Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21 CFR 1310.12(c))

Not regulated.

#### DEA Exempt Chemical Mixtures Code Number

Not regulated.

**Food and Drug Administration (FDA)** Not regulated.

**US state regulations** WARNING: This product contains a chemical known to the State of California to cause cancer.

#### US. Massachusetts RTK - Substance List

Not regulated.

#### US. New Jersey Worker and Community Right-to-Know Act

NICKEL PERCHLORATE, HEXAHYDRATE (CAS 13520-61-1) 500 lbs

#### US. Pennsylvania RTK - Hazardous Substances

Not regulated.

#### US. Rhode Island RTK

NICKEL PERCHLORATE, HEXAHYDRATE (CAS 13520-61-1)

**US. California Proposition 65****US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance**

NICKEL PERCHLORATE, HEXAHYDRATE (CAS 13520-61-1)

**International Inventories**

<b>Country(s) or region</b>	<b>Inventory name</b>	<b>On inventory (yes/no)*</b>
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	No
Canada	Non-Domestic Substances List (NDSL)	Yes
China	Inventory of Existing Chemical Substances in China (IECSC)	No
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	No
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	No
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

\*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s)

**16. Other information, including date of preparation or last revision**

<b>Issue date</b>	January-07-2014
<b>Version #</b>	01
<b>Further information</b>	Not available.
<b>Disclaimer</b>	The information in the sheet was written based on the best knowledge and experience currently available. 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.
<b>Revision Information</b>	Hazards Identification: US Hazard Categories Physical & Chemical Properties: Multiple Properties Transport Information: Proper Shipping Name/Packing Group Regulatory Information: Safety Phrases