

**CYANTEK CORPORATION**  
**MATERIAL SAFETY DATA SHEET**  
**Lodyne BOE 6:1**



**1 Product and Company Identification**

**Product name:** Lodyne BOE 6:1  
**Other product names:** None  
**Product use:** Buffered Oxide Etchant

**Manufacturer:** OM Group - Ultra Pure Chemicals  
CYANTEK CORPORATION  
3055 Osgood Court  
Fremont, CA 94538  
(510) 651-3341

**24 Hour Emergency Telephone Number:**

CHEMTREC: (800) 424-9300 (North America): (703) 527-3887 (Int'l.)

**2 Hazards Identification**

**GHS classification:**

**Corrosive to metals:** Category 1  
**Acute toxicity (oral):** Category 2  
**Acute toxicity (inhalation):** Category 3  
**Acute toxicity (dermal):** Category 3  
**Skin corrosion/irritation:** Category 1A  
**Serious eye damage/eye irritation:** Category 1  
**Specific target organ toxicity (repeated exposure):** Category 1  
**Acute aquatic environmental hazard:** Category 3

**Signal word:** Danger

**Hazard statements:** May be fatal if swallowed. Toxic if inhaled. Causes severe skin burns and eye damage. May be corrosive to metals. May cause damage to bones and teeth through prolonged or repeated exposure.

**Precautionary statements: (See section 4 for further information)**

Absorb spillage to prevent material damage. Store in plastic containers. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Wear gloves/protective clothing/face and eye protection. Avoid breathing vapors. Use only in a well-ventilated area.

If swallowed: Rinse mouth. Call a POISON CENTER or doctor/physician. Do not induce vomiting.

If on skin or hair: Remove all contaminated clothing. Wash with plenty of water.

If inhaled: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a POISON CENTER or doctor/physician.

Dispose of contents/container in accordance with local/national regulations.

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**MATERIAL SAFETY DATA SHEET**  
**Lodyne BOE 6:1**



**2 Hazards Identification (con't.)**

**Pictograms:**



**3 Composition/Information on Ingredients:**

- **Chemical formula:** NH<sub>4</sub>F + HF + Surfactant + H<sub>2</sub>O
- **Hazardous components:**

Component	Percent by wt.	CAS Number
Ammonium Fluoride	34%	12125-01-8
Hydrofluoric Acid	7%	7664-39-3
Surfactant	<1%	N/A
Water	59%	7732-18-5

**4 First Aid Measures**

**Inhalation:** Supply fresh air; consult doctor in case of complaint. If breathing has stopped, apply artificial respiration.

**Skin contact:** Flush affected areas with plenty of water, remove and dispose contaminated clothing, seek medical attention. The burned area should be immersed in a solution of 0.2% iced aqueous Hyamine 1622 or 0.13% iced aqueous Zephiran Chloride. If immersion is not practical, towels should be soaked with one of the above solutions and used as compresses for the burned area. An alternative method is for the physician to inject 10% aqueous Calcium Glutamate solution cubcutaneously around affected area. Initially use no more than 0.5 cc per square centimeter and do not distort appearance of the skin.

**Eye contact:** Rinse opened eyes for several minutes under running water. Immediately consult a doctor. If a physician is not immediately available, apply 1 to 2 drops of 0.5% Pontocaine Hydrochloride solution, followed by a second irrigation for 15 minutes. Do not use any of the solutions prescribed for skin treatment.

**Ingestion:** Give large amounts of water. Do NOT induce vomiting or aspiration into the lungs may occur and may cause permanent injury. Several glasses of milk or Milk of Magnesia may be given for their soothing effect. Do NOT give liquids to an unconscious patient. Consult a doctor immediately.

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**5 Fire Fighting Measures**

**Suitable extinguishing agents:** CO<sub>2</sub>, or water spray. Fight larger fires with water spray. Use water spray to cool exposed containers.

**Specific hazards:** Avoid contact with caustics. Contact with metals may generate Hydrogen gas.

**Protective equipment:** Wear goggles, rubber gloves and boots, self contained breathing apparatus, and acid protective clothing.

**6 Accidental Release Measures**

**Personal precautions:** Wear goggles, rubber boots and gloves, and acid protective clothing.

**Environmental precautions:** Do not allow substance to enter sewage system, surface or ground water.

**Methods for cleaning up:** Contain the spill by diking/absorbing with liquid-binding material (sand, diatomite, acid binders, universal binders). Ensure adequate ventilation. Dispose of material in accordance with local, regional, or national regulations.

**7 Handling and Storage**

Ensure good ventilation/exhaustion at the workplace.

Store between 65 and 90 Degrees F.

Keep containers upright and tightly sealed.

Store away from strong caustics.

Do not store in glass containers.

**8 Exposure Controls and Personal Protection**

**Engineering controls and Ventilation:** Use with adequate ventilation. Keep air below product exposure limits.

**General protective and hygienic measures:** Keep away from foodstuffs and beverages. Immediately remove all soiled and contaminated clothing. Wash hands before breaks and at the end of work. Avoid contact with the eyes and skin.

**Respiratory equipment:** In case of brief exposure or low pollution use acid mist respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

**Protection of hands:** Acid resistant gloves.

**Eye protection:** Tightly sealed goggles or face shield.

**Body protection:** Acid resistant protective work clothing.

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**Lodyne BOE 6:1**



**8 Exposure Controls and Personal Protection (con't.)**

**Exposure guidelines and limits:**

Ingredient	ACGIH TLV	OSHA PEL	Other Limits
Ammonium Fluoride	3 ppm (Ceiling as F))	3 ppm (TWA as F))	**
Hydrofluoric Acid	3 ppm (Ceiling as F))	3 ppm (TWA as F))	**
Surfactant	None listed	None listed	None listed

\*\* For both Ammonium Fluoride and Hydrofluoric Acid:  
 7 mg (F)/ l of urine (post shift)  
 4 mg (F)/ l of urine (pre shift)

TLV: Threshold limit value                      PEL: Permissible exposure limit  
 TWA: Time weighted average (8 hours)    IDLH: Immediately dangerous to life and Health

**9 Physical and Chemical Properties:**

**Physical state:** Liquid  
**Color:** Colorless  
**Odor:** Sharp penetrating odor  
**Odor threshold:** Unknown  
**pH:** <1  
**Melting point/freezing point:** 13 Degrees C (56 Degrees F)  
**Initial boiling point and boiling range:** 230 Degrees C  
**Flash point:** Not applicable  
**Evaporation rate:** Unknown  
**Lower explosion limits (LEL):** Not applicable  
**Upper explosion limits (UEL):** Not applicable  
**Vapor pressure (mm Hg):** Unknown  
**Vapor density (air = 1):** Unknown  
**Relative density at 20 °C (water = 1):** 1.1 g/cm<sup>3</sup>  
**Solubility in water:** 100%  
**Partition coefficient (n-Octanol/water):** Unknown  
**Auto-ignition temperature:** Not applicable  
**Decomposition temperature:** Not applicable  
**Viscosity:** Unknown

**10 Stability and Reactivity**

**Dangerous reactions:** Incompatible with glass, concrete, and other Silicon-bearing materials. Pressure build-up from this process has been known to blow up glass containers. Also incompatible with Carbonates, Sulfides, Cyanides, Carbon Dioxide, Hydrogen Sulfide, Hydrogen Cyanide, alkalis, some oxides, water reactive materials. Reaction with common metals yields Hydrogen gas, a fire and explosion hazard.

**CYANTEK CORPORATION**  
**MATERIAL SAFETY DATA SHEET**  
**Lodyne BOE 6:1**



**10 Stability and Reactivity (con't.)**

**Danger of explosion:** None

**Thermal decomposition :** If boiled to dryness and heated further, evaporation residue (Ammonium Fluoride) decomposes, yielding Ammonia gas and Hydrogen Fluoride.

**Dangerous products of decomposition:** Ammonia and Hydrogen Fluoride gases.

**Hazardous polymerization:** Does not occur

**11 Toxicological Information**

**Toxicological data:**

Hydrofluoric Acid : LCLo (inhalation - human) 50 ppm/30 min.,  
LC50 (inhalation - rat) 1276 ppm/1 hr., LC50 (inhalation - mouse) 342  
ppm/1 hr.

Ammonium Fluoride: LD50 (intraperitoneal - rat) 31 mg/kg

Surfactant: LD50 (oral - rat) 310 mg/kg, LD50 (dermal - rabbit) 600 mg/kg

**Potential side effects:**

**Eyes:** Direct contact with eyes may cause severe burns. Severe overexposure may cause blindness.

**Skin:** Direct contact with the skin causes severe burns. The effects may be delayed several hours if initial first aid measures are inadequate. Severe scarring may result.

**Ingestion:** Swallowing may cause severe burns to the esophagus and digestive tract. Ingestion is likely to cause potentially fatal hypocalcemia (Calcium deficiency in the blood).

**Inhalation:** Severe respiratory tract irritation. Mist attacks teeth and ultimately gums and jaw. Symptoms may be delayed. Excessive exposure to Hydrofluoric Acid may cause hypocalcemia or severe pulmonary edema which may be fatal.

**Acute health hazards:** May cause severe skin and respiratory system burns.

**Chronic health hazards:** Effects of chronic exposure include systemic Fluoride toxicity, osteosclerosis, and mottling of the teeth. Hypocalcemia, metabolic acidosis, pulmonary edema, and death can occur from high level chronic exposure.

**Medical conditions generally aggravated by exposure:** Respiratory and skin diseases may predispose one to acute and chronic effects.

**Sensitization:** No sensitizing effects known.

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**Lodyne BOE 6:1**



**12 Ecological Information:**

**Eco-toxicity/bioaccumulation data:**

Hydrofluoric Acid: 60 ppm/time period not specified/fish/lethal/fresh water

Ammonium Fluoride: None available

Surfactant: LC50 10-100 mg/L/Static 48 hour/Golden orfe. 60% degradable in water, static test

**General notes:** Do not allow product to reach ground water, water course or sewage system. Danger to drinking water if even small quantities leak into the ground.

**13 Disposal Considerations**

Dispose of product (including containers) in accordance with applicable regulations.

**14 Transportation Information**

**Land (CFR 49), Maritime (IMDG), Air (ICAO)**

**Class:** 8 (Corrosive Liquid)

**Subsidiary Risk:** 6.1 (Toxic)

**UN Number:** 2922

**Proper Shipping Name:** Corrosive liquid toxic, n.o.s. (Hydrofluoric Acid, Ammonium Fluoride)

**Packing Group:** II

**Marine pollutant:** No

**15 Regulatory Information**

- **CERCLA Hazardous Substances (with reportable quantity):** Hydrofluoric Acid (100#), Ammonium Fluoride (100#)
- **Extremely Hazardous Substances (with threshold quantity):** Hydrofluoric Acid (100#)
- **Toxic Chemicals (Section 313):** Hydrofluoric Acid
- **TSCA Inventory:** All ingredients on TSCA inventory
- **Proposition 65 List:** None
- **Clean Water Act Hazardous Substance List (with reportable quantity):** Hydrofluoric Acid (100#), Ammonium Fluoride (100#)

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**MATERIAL SAFETY DATA SHEET**  
**Lodyne BOE 6:1**



**15 Regulatory Information (con't.)**

- **Clean Air Act Synthetic Organic Chemical (CAA SOCM):** None
- **Clean Air Act Accidental Release Prevention Substance, section 112 r (with threshold quantity):** Hydrofluoric Acid (1000#)
- **PSM Highly Hazardous Chemical List (with threshold quantity):** Hydrofluoric Acid (1000#)
- **Clean Air Act Hazardous Air Pollutants:** Hydrofluoric Acid (HAP code X)

**16 Other Information**

**MSDS document number:** MSDS 17-480

**Current date and revision:** 8/13/10, revision C

**Supercedes date and revision:** 6/20/08, revision B

**MSDS author:** Gregg Harvey

**Note:** This Material Safety Data Sheet was created using the Globally Harmonized System (GHS) format for Safety Data Sheets (SDS).

**Disclaimer:** This information is based upon information and sources available at the time of preparation. This shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship. It is the obligation of the user to determine product suitability and comply with the requirements of all applicable laws regarding use and disposal of this product.