

# SAFETY DATA SHEET (SDS)

## Lithium Niobate (LN)



It is the policy of Gooch & Housego to ensure, as far as is reasonably practicable, the health, safety and welfare of all our employees and visitors.

OSHA Hazard Communication Standard 29 CFR 1910.1200  
EC Regulation No 1907/2006 (REACH)

## 1. Product and Company Identification

### Product Identifier

- **Substance Name:** Lithium Niobate
- **Other Names:** Lithium Niobium Trioxide, LN
- **Formula:** LiNbO<sub>3</sub>
- **Index Number:** Not Assigned
- **EC Number:** 234-755-4
- **CAS Number:** 12031-63-9
- **REACH Number:** Not Assigned

### Relevant Identified Uses of the Substance or Mixture and Uses Advised Against

- **Use:** Laser control/manipulation, frequency band-pass filters, optical waveguides
- **Advised Against:** None Identified

### Manufacture/Supplier Details

- Gooch & Housego (Ohio) LLC, 676 Alpha Drive, Highland Heights, OH 44143 USA

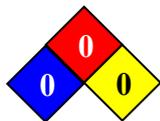
## 2. Hazard(s) Identification

### Classification of the Substance or Mixture

- **Substance is NOT Explosive, Flammable, Toxic, Corrosive or an Oxidizing Agent**
- **Note:** Lithium Niobate is a pyroelectric/piezoelectric material which can develop static electric charges and may crack or shatter when exposed to rapid temperature changes or pressure.

### Classification System: NFPA/HMIS Definitions: 0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme

- **NFPA Ratings (scale 0-4):**



Health = 0  
Fire = 0  
Reactivity = 0

- **HMIS Ratings (scale 0-4):**

<b>HEALTH</b>	<b>0</b>	
<b>FIRE</b>	<b>0</b>	
<b>REACTIVITY</b>	<b>0</b>	

Health = 0  
Fire = 0  
Reactivity = 0

- **Other Hazards:** None

### Product Identifier

- **PBT (Persistent Bioaccumulative and Toxic):** Not Applicable
- **vPvB (very Persistent very Bioaccumulative):** Not Applicable

### 3. Composition / Information on Ingredients

#### Description of Substance

- **Lithium Niobate (compound):** Single Crystal Oxide

CAS	EC	REACH	% Weight	Name
554-13-2	209-062-5	01-2119516034-53-0000	~20%	Lithium Carbonate
1313-96-8	215-213-6	01-2119548385-32-0000	~80%	Niobium Pentoxide
7782-44-7	213-956-9	Exempt	Negligible	Oxygen

**Hazardous Ingredients:** None

### 4. First-Aid Measures

#### Description of First Aid Measures

- **General Information:** Diced or broken edges are sharp and may puncture and/or cut skin.
- **Inhalation:** No known issues.
- **Skin Contact:** Cuts to be rinsed, sterilized and bandaged according to degree of severity. Personal Protective equipment recommended for first aid responder(s).
- **Eye Contact:** Rinse with rinsing solution or water. Outside medical attention may be required.
- **Ingestion:** Outside medical attention may be required.
- **Overexposure Symptoms:** No known applicable information.

### 5. Fire-Fighting Measures

- **Extinguishing Media:** None required. Substance is non-flammable.
- **Special Hazards Arising from the Substance:** None.
- **Advice for Fire-Fighters:** Wear self-contained breathing apparatus for fire-fighting if necessary.
- **Protective Equipment:** No special measures required.

### 6. Accidental Release Measures

#### Emergency Procedure

- **Personal Precautions, Protective Equipment and Emergency Procedures:** None required.
- **Avoid dust formation.** Avoid breathing vapors, mist of gas.

#### Environmental Precaution

- **Methods and Materials for Containment and Clean-up:** None required.
- **Do not let product enter drains.**
- **General Information:** Material is landfill safe.

### 7. Handling and Storage

#### Precautions for Safe Handling

- Depending on usage, protective eyewear and/or gloves may be required to prevent puncture wounds and/or cuts.

#### Explosion and/or Fire Protection

- No special measures required.

#### Conditions for Safe Storage

- No special measures required.

## 8. Exposure Controls / Personal Protection

### Control Parameters

- OSHA PEL (*Personal Exposure Limits*): None Established.
- OSHA REL (*Recommended Exposure Limits*): None Established.
- OSHA TLV (*Threshold Limit Value*): None Established.
- Occupational Exposure Limits: **None Defined / Not Applicable**

Limit Value Type (country of origin)	Substance Name	EC Number	CAS Number	Occupational Exposure Limit Value		Recommended Oversight Process	Peak Limitation	Source
				Long Term	Short Term			

- Biological Limit Values: **None Defined / Not Applicable**

Limit Value Type (country of origin)	Substance Name	EC Number	CAS Number	Limit Value	Investigation Parameter	Source	Remark

- Exposure Limits at Intended Use: **None Defined / Not Applicable**
- DNEL / PNEC Values:

### DNEL (Derived No-Effect Limit): **None Defined / Not Applicable**

Worker:		Consumer	Exposure Route	Exposure Frequency	Remark
Industry	Professional				
			Oral	Short Term (acute)	
				Long Term( repeated)	
			Dermal	Short Term (acute)	
				Long Term( repeated)	
			Inhalation	Short Term (acute)	
				Long Term( repeated)	

### PNEC: (Predicted No-Effect Concentration) **None Defined / Not Applicable**

Worker:		Consumer	Exposure Route	Exposure Frequency	Remark
Industry	Professional				
			Water	Short Term (single use)	
				Long Term (continuous)	
			Soil	Short Term (single use)	
				Long Term (continuous)	
			Air	Short Term (single use)	
				Long Term (continuous)	

- Control Banding for Chemicals according to the ILO Chemical Control Tool Kit (ICCT): **N/A**

Task	Hazard Band	Scale Of Use	Ability To Become Airborne	Control Approach	ICCT Control Guidance Sheet (see especially)

## 9. Exposure Controls / Personal Protection (cont'd)

- **Exposure Controls:** None required.
- **Personal Protection Equipment:** Depending on usage, protective eyewear and/or gloves may be required to prevent puncture wounds and/or cuts.
- **Environmental Exposure Controls:** None Required
- **Consumer Protection Control:** None Required.

## 10. Physical and Chemical Properties

### Molecular and Structural – Single Crystal Inorganic Oxide

- **Chemical Formula:** LiNbO<sub>3</sub>
- **Physical State:** Solid (glass like)
- **Odor:** Odorless
- **Density(g/cm<sup>3</sup>):** 4.65g/cm<sup>3</sup>
- **Evaporation Rate** (Butyl Acetate = 1): 0
- **Melting Point:** ~1257°C
- **Flammability (solid/gas):** Not Flammable
- **Upper/Lower Flammability:** Non-Flammable
- **Auto-ignition Temperature:** Not Applicable
- **Solubility in Water (20°C in g/l):** Insoluble
- **Viscosity (mPa s):** Not Applicable
- **Color:** Clear, Colorless
- **Odor Threshold: Not Applicable**
- **Specific Gravity** (H<sub>2</sub>O = 1): 4.64
- **Vapor Pressure** (mm Hg): 0
- **Boiling Point:** >1649°C
- **Flash Point:** Not Applicable
- **Explosive Limit:** Non-Explosive
- **Decomposition Temp.:** Not Applicable
- **pH(20°C):** Not Applicable
- **Partition Coefficient:** Not Applicable

## 11. Stability and Reactivity

- **Reactivity:** Non-reactive under normal usage conditions.
- **Chemical Stability:** Stable under normal ambient and anticipated storage and handling conditions.
- **Possibility of Hazardous Reactions:** Material possesses pyroelectric and piezoelectric properties. Material surface may exhibit a surface build-up of static electric charges when heated or placed under pressure.
- **Conditions to Avoid:** Rapid temperature changes may cause the material to fracture and/or splinter.
- **Incompatible Materials:** None known
- **Hazardous Decomposition Products:** None known

## 12. Toxicological Information

- **Likely Routes of Exposure (inhalation, ingestion, skin or eye contact):** Not Applicable
- **Delayed, Immediate or Chronic Effects from Short- or Long-Term Exposure:** None Known
- **Numerical Measures of Toxicity: Non-Toxic:** Not Applicable
- **Description of Symptoms:** Not Applicable

### Carcinogenic Categories

- **IARC (International Agency for Research on Cancer):** Substance Not Listed
- **NTP (National Toxicology Program):** Substance Not Listed

## 13. Ecological Information

### Toxicity

- **Aquatic Toxicity:** No Available Information

### Behavior in Environment Systems

- **Bioaccumulative Potential (K<sub>ow</sub>, BCF):** No Available Information
- **Mobility in Soil:** No Available Information
- **Other Adverse Effects:** No Available Information

## 14. Disposal Considerations

### Waste Treatment Methods

- **Recommendations:**

Substance has been deemed landfill safe in California, but local regulatory guidance should always be investigated and applied.  
Avoid any disposal to waste water systems.

## 15. Transport Information

- **UN Number:** None Assigned.
- **UN Proper Shipping Name:** Not Assigned.
- **Transport Hazard Class:** Not Applicable. Non-Hazardous Material
- **Packing Group Number:** Not Applicable
- **Environmental Hazards:** None
- **IBC Code (*International Bulk Chemical Code*):** Not Applicable
- **Hazards Label:** Not Applicable

## 16. Regulatory Information

### National Regulations (United States)

- **OSHA (*Occupational and Health Administration*):** None Assigned
- **DOT (*Department Of Transportation*):** None Assigned
- **EPA (*Environmental Protection Agency*):** None Assigned
- **CPSC (*Consumer Product Safety Commission*):** None Assigned
- **Proposition 65 (California):** Not Listed (revision 2014/04/04)

### EU Regulations

- **Authorizations:** Not listed in Annex 1 of EC Regulation No 649/2012
- **Restrictions On Use:** None Known
- **Chemical Safety Assessment:** No Available Information

## 17. Other Information

- **Last Review/Revision Date:** 2014/04/15
- **Other:** None