



2950 HIGHWAY DRIVE, TRAIL, BC, V1R 2T3, CANADA
 PHONE: (250) 364-5605 FAX: (250) 364-5643

Material Safety Data Sheet Ge (Germanium) metal

SECTION 1 - PRODUCT INFORMATION

Product Identifier:	Ge (Germanium; high purity; 5N, 6N, 7N)	Street Address:	2950 Highway Drive	
Product Use:	Produced and used in Laboratory settings	City: Trail	Province: B.C.	Postal Code: V1R 2T3
Manufacturer's Name:	Firebird Technologies Inc.		Emergency Telephone: 1-250-364-5605 x204	

SECTION 2 - HAZARDOUS INGREDIENTS

Hazardous Ingredients (<i>specific</i>)	%	CAS Number	LD ₅₀ of Ingredient (<i>specify species and route</i>)	LC ₅₀ of Ingredient (<i>specify species</i>)
Germanium metal; ingot or fabricated forms	100%	7440-56-4	N/A	N/A

SECTION 3 - PHYSICAL DATA

Physical State: Crystalline Solid	Odor and Appearance: grayish-white lustrous brittle solid, odourless		Odor Threshold (ppm): N/A
Specific Gravity: 5.32 (300K)	Vapor Density (air= 1): N/A	Vapor Pressure: very low @ 300K	Evaporation Rate: very low at 300K
Boiling Point (°C): 2830	Freezing Point (°C): 937	pH: N/A	Coefficient of Water/Oil Distribution: N/A

SECTION 4 - FIRE AND EXPLOSION DATA

Flammability	slight	Finely divided powder may ignite if heated in air	
Means of Extinction: CO2 or water; never use water on molten metal, use sand instead			
Flashpoint(°C)and Method: N/A	Upper Flammable Limit (% by volume): N/A		Lower Flammable Limit (% by volume): N/A
Auto ignition Temperature (°C): N/A	Explosion Data - Sensitivity to Impact: None		Explosion Data: N/A
Hazardous Combustion Products: Vapor oxidizes to GeO, or GeO ₂ at flame temperatures. Use self-contained breathing apparatus when fighting fires in an enclosed area.			

SECTION 5 - REACTIVITY DATA

Chemically Stable	Yes, normal conditions	
Incompatibility with Other Substances	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Incompatible with strong oxidizing agents.
Reactivity: Avoid temperatures in excess of 1000C to prevent fume. Standard laboratory procedures for any reactions.		
Hazardous Decomposition Products: Vapor oxidizes to GeO, GeO ₂ at flame temperatures. Keep below 1000°C to avoid fumes.		

SECTION 6 – TOXICOLOGICAL PROPERTIES

Route of Entry: <input type="checkbox"/> Skin Contact <input type="checkbox"/> Skin Absorption <input checked="" type="checkbox"/> Eye Contact <input checked="" type="checkbox"/> Inhalation <input checked="" type="checkbox"/> Ingestion
Germanium metal is relatively non-toxic by all routes of exposure, particularly in massive forms.
Effects of Acute Exposure to Product: Fine powder can enter the body through Inhalation and/or eye contact causing irritation of the mucous membranes (i.e. runny nose, itchy eyes, sneezing). Wash contaminated clothing before re-use. Wash hands before eating after any exposure. Do not use contaminated cigarettes.
Ingestion of high doses of Ge <u>salts</u> may cause kidney and bladder injury; native element passes without evident effect.
Effects of Chronic Exposure to Product: Prolonged skin exposure to finely divided powder or fume from overheating could cause dermatitis

Exposure Limits(value, source, date): None established, 10 mg m ⁻³ suggested	Irritancy (if yes, explain) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Sensitization (if yes, explain) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Carcinogenicity (if yes, explain) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Reproductive Toxicity (if yes, explain) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Teratogenicity (if yes, explain) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Mutagenicity (if yes, explain) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Synergistic Products (if yes, explain) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

SECTION 7 – PREVENTIVE MEASURES

Personal Protective Equipment <input checked="" type="checkbox"/> Gloves <input checked="" type="checkbox"/> Respirator <input checked="" type="checkbox"/> Eye <input type="checkbox"/> Footwear <input type="checkbox"/> Clothing <input type="checkbox"/> Other	
If checked, specify type: Use impervious gloves when handling material. Safety glasses and a particulate respirator should be worn if material will be handled in powder form.	
Engineering Controls: General (mechanical) room ventilation is expected to be satisfactory. If melting or high temperature processing use collection/extraction ventilation.	
Leak and Spill Procedure: Clean spills using proper tools (broom, dust pan). Minimize dust .	
Waste Disposal: Dispose of in accordance with all appropriate local regulations	
Handling Procedures and Equipment: Handle with gloves. Use a face shield when breaking, etching or reacting.	
Storage Requirements: Normal precautions should be taken. Keep containers closed to avoid contamination	
Special Shipping Information: None known	PIN:

SECTION 8 – FIRST AID MEASURES

Inhalation: Ingestion of powder, fume from overheating may be irritating
Ingestion: considered to be of low toxicity
Skin Contact: Possible low-level local irritation -wash skin with soap and water.
Eye Contact: Local irritation -flush eyes thoroughly with water for several minutes. Remove contact lenses, if worn.

SECTION 9 – PREPARATION INFORMATION

Prepared by: W.F. Micklethwaite	Telephone Number: 1-250-364-5605 x204	Preparation Date: 060407
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