

Safety Data Sheet



Section 1: Identification of the Substance/Mixture and of the Company/Undertaking

1.1 Product identifier

- Product Name** • **Bismuth Germanate Crystal**
- Synonyms** • BGO or Bi₄Ge₃O₁₂
- CAS Number** • 12233-56-6

1.2 Relevant identified uses of the substance or mixture and uses advised against

- Relevant identified use(s)** • Scintillation material for Radiation Detection

1.3 Details of the supplier of the safety data sheet

- Manufacturer** • Saint-Gobain Crystals
17900 Great Lakes Parkway
Hiram, OH 44234
United States
www.crystals.saint-gobain.com
scintillation@saint-gobain.com
- Telephone (General)** • 440-834-5600

1.4 Emergency telephone number

- Manufacturer** • 1-800-424-9300 - ChemTrec
- Manufacturer** • 703-525-3887 - Outside U.S.

Section 2: Hazards Identification

EU/EEC

According to: Regulation (EC) No 1272/2008 (CLP)/REACH 1907/2006 [amended by 2015/830]

According to: EU Directive 67/548/EEC (DSD) or 1999/45/EC (DPD)

2.1 Classification of the substance or mixture

- CLP** • Skin Irritation 2 - H315
Eye Irritation 2 - H319
Specific Target Organ Toxicity Single Exposure 3: Respiratory Tract Irritation - H335
- DSD/DPD** • Irritant (Xi)
R36, R37, R38

2.2 Label Elements

CLP

WARNING



- Hazard statements** • H315 - Causes skin irritation
 H319 - Causes serious eye irritation
 H335 - May cause respiratory irritation

Precautionary statements

- Prevention** • P261 - Avoid breathing dust.
 P264 - Wash thoroughly after handling.
 P271 - Use only outdoors or in a well-ventilated area.
 P280 - Wear protective gloves/protective clothing/eye protection/face protection.
- Response** • P304+P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
 P312 - Call a POISON CENTER or doctor/physician if you feel unwell.
 P302+P352 - IF ON SKIN: Wash with plenty of soap and water.
 P321 - Specific treatment, see supplemental first aid information.
 P332+P313 - If skin irritation occurs: Get medical advice/attention.
 P362 - Take off contaminated clothing and wash before reuse.
 P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P337+P313 - If eye irritation persists: Get medical advice/attention.
- Storage/Disposal** • P403+P233 - Store in a well-ventilated place. Keep container tightly closed.
 P405 - Store locked up.
 P501 - Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

DSD/DPD



- Risk phrases** • R36 - Irritating to eyes.
 R37 - Irritating to respiratory system.
 R38 - Irritating to skin.
- Safety phrases** • S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

2.3 Other Hazards

- CLP** • According to Regulation (EC) No. 1272/2008 (CLP) this material is considered hazardous.
- DSD/DPD** • According to European Directive 1999/45/EC this material is considered dangerous.

United States (US)

According to: OSHA 29 CFR 1910.1200 HCS

2.1 Classification of the substance or mixture

- OSHA HCS 2012** • Skin Irritation 2
 Eye Irritation 2
 Specific Target Organ Toxicity Single Exposure 3: Respiratory Tract Irritation

2.2 Label elements

OSHA HCS 2012

WARNING



- Hazard statements** • Causes skin irritation
 Causes serious eye irritation
 May cause respiratory irritation

Precautionary statements

- Prevention** • Avoid breathing dust.
 Wash thoroughly after handling.
 Use only outdoors or in a well-ventilated area.
 Wear protective gloves/protective clothing/eye protection/face protection.
- Response** • IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
 Call a POISON CENTER or doctor/physician if you feel unwell.
 If on skin: Wash with plenty of water .
 Specific treatment, see supplemental first aid information.
 Take off contaminated clothing and wash before reuse.
 If skin irritation occurs: Get medical advice/attention.
 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 If eye irritation persists: Get medical advice/attention.

- Storage/Disposal** • Store in a well-ventilated place. Keep container tightly closed.
 Store locked up.
 Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

2.3 Other hazards

OSHA HCS 2012

- Under United States Regulations (29 CFR 1910.1200 - Hazard Communication Standard), this product is considered hazardous.

Canada

According to: WHMIS

2.1 Classification of the substance or mixture

- WHMIS • Other Toxic Effects - D2B

2.2 Label elements

WHMIS



- WHMIS • Other Toxic Effects - D2B

2.3 Other hazards

WHMIS

- In Canada, the product mentioned above is considered hazardous under the Workplace Hazardous Materials Information System (WHMIS).

Section 3 - Composition/Information on Ingredients

3.1 Substances

Composition					
Chemical Name	Identifiers	%	LD50/LC50	Classifications According to Regulation/Directive	Comments
Bismuth Germanate	CAS:12233-56-6 EINECS:235-457-7	100%	NDA	EU DSD/DPD: Not Classified EU CLP: Not Classified OSHA HCS 2012: Not Classified	NDA

3.2 Mixtures

- Material does not meet the criteria of a mixture.

Section 4 - First Aid Measures

4.1 Description of first aid measures

- Inhalation**
- Move victim to fresh air. Give artificial respiration if victim is not breathing. Administer oxygen if breathing is difficult. If signs/symptoms continue, get medical attention.
- Skin**
- Wash skin with soap and water. If irritation develops and persists, get medical attention.
- Eye**
- In case of contact with substance, immediately flush eyes with running water for at least 20 minutes. If eye irritation persists: Get medical advice/attention.
- Ingestion**
- If large quantities are swallowed, call a physician immediately.

4.2 Most important symptoms and effects, both acute and delayed

- Refer to Section 11 - Toxicological Information.

4.3 Indication of any immediate medical attention and special treatment needed

- Notes to Physician**
- All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

Section 5 - Firefighting Measures

5.1 Extinguishing media

- Suitable Extinguishing Media**
- Use water, carbon dioxide or foam.

- Unsuitable Extinguishing Media**
- No data available

5.2 Special hazards arising from the substance or mixture

- Unusual Fire and Explosion Hazards**
- Not a fire or explosion hazard.

- Hazardous Combustion Products**
- No data available

5.3 Advice for firefighters

- Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters' protective clothing will only provide limited protection.

Section 6 - Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

- Personal Precautions**
- Ventilate enclosed areas. Do not walk through spilled material. Wear appropriate personal protective equipment, avoid direct contact. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Emergency Procedures**
- As an immediate precautionary measure, isolate spill or leak area for at least 25 meters (75 feet) in all directions. Keep unauthorized personnel away.

6.2 Environmental precautions

- Avoid release to the environment.

6.3 Methods and material for containment and cleaning up

Containment/Clean-up Measures

- If broken or not usable, scoop up for vacuum into a container for disposal.

6.4 Reference to other sections

- Refer to Section 8 - Exposure Controls/Personal Protection and Section 13 - Disposal Considerations.

Section 7 - Handling and Storage**7.1 Precautions for safe handling****Handling**

- Use only with adequate ventilation. Wear appropriate personal protective equipment, avoid direct contact. Avoid breathing dust. Avoid contact with skin, eyes or clothing. Wash thoroughly with soap and water after handling and before eating, drinking, or using tobacco.

7.2 Conditions for safe storage, including any incompatibilities**Storage**

- Keep container/package tightly closed and in a well-ventilated place.

7.3 Specific end use(s)

- Refer to Section 1.2 - Relevant identified uses.

Section 8 - Exposure Controls/Personal Protection**8.1 Control parameters****Exposure Limits/Guidelines**

- No applicable exposure limits available for product or components.

8.2 Exposure controls**Engineering Measures/Controls**

- Good general ventilation 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.

Personal Protective Equipment**Respiratory**

- For limited exposure use an N95 dust mask. For prolonged exposure use an air-purifying respirator with high efficiency particulate air (HEPA) filters. Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or symptoms are experienced.

Eye/Face

- Wear safety goggles.

Skin/Body

- Wear appropriate gloves. Wear long sleeves and/or protective coveralls.

Environmental Exposure Controls

- Follow best practice for site management and disposal of waste. Controls should be engineered to prevent release to the environment, including procedures to prevent spills, atmospheric release and release to waterways.

Section 9 - Physical and Chemical Properties**9.1 Information on Basic Physical and Chemical Properties****Material Description**

Physical Form	Solid	Appearance/Description	Water white transparent solid to pale yellow translucent solid; odorless.
Color	Water white transparent to pale yellow translucent.	Odor	Odorless
Odor Threshold	Data lacking		

General Properties

Boiling Point	Data lacking	Melting Point/Freezing Point	1050 °C(1922 °F)
Decomposition Temperature	Data lacking	pH	Not relevant
Specific Gravity/Relative Density	7.13 g/cm3	Water Solubility	Data lacking
Viscosity	Data lacking	Explosive Properties	Data lacking
Oxidizing Properties:	Data lacking		

Volatility

Vapor Pressure	Data lacking	Vapor Density	Data lacking
Evaporation Rate	Data lacking		

Flammability

Flash Point	Not relevant	UEL	Not relevant
LEL	Not relevant	Autoignition	Data lacking
Flammability (solid, gas)	Data lacking		

Environmental

Octanol/Water Partition coefficient	Data lacking		
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9.2 Other Information

- No additional physical and chemical parameters noted.

Section 10: Stability and Reactivity**10.1 Reactivity**

- No dangerous reaction known under conditions of normal use.

10.2 Chemical stability

- Stable under normal temperatures and pressures.

10.3 Possibility of hazardous reactions

- Hazardous polymerization not indicated.

10.4 Conditions to avoid

- None expected.

10.5 Incompatible materials

- No data available.

10.6 Hazardous decomposition products

- None expected.

Section 11 - Toxicological Information**11.1 Information on toxicological effects**

GHS Properties	Classification
Acute toxicity	EU/CLP • Data lacking OSHA HCS 2012 • Data lacking
Skin corrosion/Irritation	EU/CLP • Skin Irritation 2 OSHA HCS 2012 • Skin Irritation 2
Serious eye damage/Irritation	EU/CLP • Eye Irritation 2 OSHA HCS 2012 • Eye Irritation 2

Skin sensitization	EU/CLP • Data lacking OSHA HCS 2012 • Data lacking
Respiratory sensitization	EU/CLP • Data lacking OSHA HCS 2012 • Data lacking
Aspiration Hazard	EU/CLP • Data lacking OSHA HCS 2012 • Data lacking
Carcinogenicity	EU/CLP • Data lacking OSHA HCS 2012 • Data lacking
Germ Cell Mutagenicity	EU/CLP • Data lacking OSHA HCS 2012 • Data lacking
Toxicity for Reproduction	EU/CLP • Data lacking OSHA HCS 2012 • Data lacking
STOT-SE	EU/CLP • Specific Target Organ Toxicity Single Exposure 3: Respiratory Tract Irritation OSHA HCS 2012 • Specific Target Organ Toxicity Single Exposure 3: Respiratory Tract Irritation
STOT-RE	EU/CLP • Data lacking OSHA HCS 2012 • Data lacking

Potential Health Effects

Inhalation

- Acute (Immediate)** • May cause respiratory irritation.
- Chronic (Delayed)** • No data available

Skin

- Acute (Immediate)** • Causes skin irritation.
- Chronic (Delayed)** • No data available.

Eye

- Acute (Immediate)** • Causes serious eye irritation.
- Chronic (Delayed)** • No data available.

Ingestion

- Acute (Immediate)** • No adverse effects expected.
- Chronic (Delayed)** • No data available.

Key to abbreviations

LD = Lethal Dose

TD = Toxic Dose

Section 12 - Ecological Information

12.1 Toxicity

- Material data lacking.

12.2 Persistence and degradability

- Material data lacking.

12.3 Bioaccumulative potential

- Material data lacking.

12.4 Mobility in Soil

- Material data lacking.

12.5 Results of PBT and vPvB assessment

- No PBT and vPvB assessment has been conducted.

12.6 Other adverse effects

- No studies have been found.

Section 13 - Disposal Considerations

13.1 Waste treatment methods

Product waste

- Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Packaging waste

- Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Section 14 - Transport Information

	14.1 UN number	14.2 UN proper shipping name	14.3 Transport hazard class(es)	14.4 Packing group	14.5 Environmental hazards
DOT	NDA	Not Regulated	NDA	NDA	NDA
TDG	NDA	Not Regulated	NDA	NDA	NDA
IMO/IMDG	NDA	Not Regulated	NDA	NDA	NDA
IATA/ICAO	NDA	Not Regulated	NDA	NDA	NDA

14.6 Special precautions for user

- None specified.

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code

- Data lacking.

Section 15 - Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

SARA Hazard Classifications

- Acute

State Right To Know		
Component	CAS	PA
Bismuth Germanate	12233-56-6	No

Inventory						
Component	CAS	Canada DSL	Canada NDSL	China	Korea KECL	TSCA
Bismuth Germanate	12233-56-6	No	Yes	No	Yes	Yes

Canada

Labor

Canada - WHMIS - Classifications of Substances

- Bismuth Germanate 12233-56-6 Not Listed

Canada - WHMIS - Ingredient Disclosure List

• Bismuth Germanate	12233-56-6	Not Listed
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Environment**Canada - CEPA - Priority Substances List**

• Bismuth Germanate	12233-56-6	Not Listed
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United States**Labor****U.S. - OSHA - Process Safety Management - Highly Hazardous Chemicals**

• Bismuth Germanate	12233-56-6	Not Listed
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U.S. - OSHA - Specifically Regulated Chemicals

• Bismuth Germanate	12233-56-6	Not Listed
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Environment**U.S. - CAA (Clean Air Act) - 1990 Hazardous Air Pollutants**

• Bismuth Germanate	12233-56-6	Not Listed
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U.S. - CERCLA/SARA - Hazardous Substances and their Reportable Quantities

• Bismuth Germanate	12233-56-6	Not Listed
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U.S. - CERCLA/SARA - Radionuclides and Their Reportable Quantities

• Bismuth Germanate	12233-56-6	Not Listed
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U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances EPCRA RQs

• Bismuth Germanate	12233-56-6	Not Listed
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U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances TPQs

• Bismuth Germanate	12233-56-6	Not Listed
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U.S. - CERCLA/SARA - Section 313 - Emission Reporting

• Bismuth Germanate	12233-56-6	Not Listed
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U.S. - CERCLA/SARA - Section 313 - PBT Chemical Listing

• Bismuth Germanate	12233-56-6	Not Listed
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United States - California**Environment****U.S. - California - Proposition 65 - Carcinogens List**

• Bismuth Germanate	12233-56-6	Not Listed
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U.S. - California - Proposition 65 - Developmental Toxicity

• Bismuth Germanate	12233-56-6	Not Listed
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U.S. - California - Proposition 65 - Maximum Allowable Dose Levels (MADL)

• Bismuth Germanate	12233-56-6	Not Listed
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U.S. - California - Proposition 65 - No Significant Risk Levels (NSRL)

• Bismuth Germanate	12233-56-6	Not Listed
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U.S. - California - Proposition 65 - Reproductive Toxicity - Female

• Bismuth Germanate	12233-56-6	Not Listed
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U.S. - California - Proposition 65 - Reproductive Toxicity - Male

• Bismuth Germanate	12233-56-6	Not Listed
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United States - Pennsylvania

Labor

U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List

• Bismuth Germanate	12233-56-6	Not Listed
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U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances

• Bismuth Germanate	12233-56-6	Not Listed
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15.2 Chemical Safety Assessment

- No Chemical Safety Assessment has been carried out.

Section 16 - Other Information

Revision Date

- 24/May/2017

Preparation Date

- 08/January/2015

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Key to abbreviations

NDA = No data available