# SAFETY DATA SHEET

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## SECTION 1. IDENTIFICATION

**Product Identifier:** (3N) 99.9% Bismuth Tellurium Selenide

**Product Code:** BI-TESE-03-C

**CAS Number:** N/A

**Relevant identified uses of the substance:** Scientific research and development

Supplier details:

American Elements
10884 Weyburn Ave.
Los Angeles, CA 90024
Tel: +1 310-208-0551
Fax: +1 310-208-0351
Emergency telephone number:
+1 800-424-9300

## SECTION 2. HAZARDS IDENTIFICATION

Classification of the substance or mixture
GHS02 Flame
H228 Flammable solid.
H303 May be harmful if swallowed.
Classification according to Directive 67/548/EEC or Directive 1999/45/EC
F; Highly flammable
R11: Highly flammable.
Information concerning particular hazards for human and environment: N/A Label elements
Labelling according to EU guidelines:
Observe the general safety regulations when handling chemicals
Code letter and hazard designation of product:
F Highly flammable
Risk phrases:
11 Highly flammable.
Safety phrases:
33 Take precautionary measures against static discharges.
Hazard description:



WHMIS classification B4 - Flammable solid Classification system
HMIS ratings (scale 0-4)
(Hazardous Materials Identification System) Health (acute effects) = 1
Flammability = 2
Reactivity = 1
Other hazards
Results of PBT and vPvB assessment PBT: N/A
vPvB: N/A

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## SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Bismuth 7440-69-9
Tellurium 13494-80-9
Selenium 7782-49-2

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## SECTION 4. FIRST AID MEASURES

Description of first aid measures
If inhaled:
Supply patient with fresh air. If not breathing, provide artificial respiration. Keep patient warm. Seek immediate medical advice.
In case of skin contact:
Immediately wash with soap and water; rinse thoroughly.
Seek immediate medical advice.
In case of eye contact:
Rinse opened eye for several minutes under running water. Consult a physician. If swallowed:
Seek medical treatment.
Information for doctor
Most important symptoms and effects, both acute and delayed
No data available
Indication of any immediate medical attention and special treatment needed
No data available

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## SECTION 5. FIREFIGHTING MEASURES

Extinguishing media
Suitable extinguishing agents Special powder for metal fires. Do not use water. For safety reasons unsuitable extinguishing agents Water
Special hazards arising from the substance or mixture
In case of fire, the following can be released:
Metal oxide fume
Advice for firefighters
Protective equipment:
Wear self-contained respirator. Wear fully protective impervious suit.

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## SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Keep unprotected persons away.
Ensure adequate ventilation
Keep away from ignition sources
Environmental precautions:
Do not allow material to be released to the environment without official permits. Methods and materials for containment and cleanup:
Ensure adequate ventilation.
Keep away from ignition sources.
Reference to other sections
See Section 7 for information on safe handling
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

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## SECTION 7. HANDLING AND STORAGE

Handling
Precautions for safe handling
Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.
Ensure good ventilation at the workplace.
Information about protection against explosions and fires:
Protect against electrostatic charges.
Conditions for safe storage, including any incompatibilities
Requirements to be met by storerooms and receptacles: Store in a cool location. Information about storage in one common storage facility:
Do not store together with acids.
Store away from oxidizing agents.
Store away from halogens.
Further information about storage conditions:
Keep container tightly sealed.
Store in cool, dry conditions in well-sealed containers.
Specific end use(s) No data available

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## SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.
Control parameters
Components with limit values that require monitoring at the workplace:
Additional information: No data
Exposure controls
Personal protective equipment
Follow typical protective and hygienic practices for handling chemicals. Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Maintain an ergonomically appropriate working environment.
Breathing equipment: Use suitable respirator when high concentrations are present. Protection of hands:
Impervious gloves

Inspect gloves prior to use.
Material of gloves
The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.
Eye protection: Safety glasses
Body protection: Protective work clothing.

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## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties General Information
Appearance:
Form: Powder
Color: Grey
Odor: Odorless
Odor threshold: No data available.
pH: N/A
Melting point/Melting range: 271.4°C (521 °F)
Boiling point/Boiling range: 1564°C (2847 °F)
Sublimation temperature / start: No data available
Flash point: N/A
Flammability (solid, gas) Highly flammable.
Ignition temperature: No data available
Decomposition temperature: No data available
Autoignition: No data available.
Explosion limits:
Lower: No data available
Upper: No data available
Vapor pressure at 840°C (1544 °F): 1 hPa (1 mm Hg)

Density at 20°C (68 °F): 9.79 g/cm$^3$ (81.698 lbs/gal)

Bulk density at 20°C (68 °F): 6000 kg/m$^3$
Relative density No data available.
Vapor density N/A
Evaporation rate N/A
Solubility in / Miscibility with
Water: Insoluble
Segregation coefficient (n-octonol/water): No data available.
Viscosity:
Dynamic: N/A
Kinematic: N/A
Other information No data available

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## SECTION 10. STABILITY AND REACTIVITY

Reactivity
Chemical stability
Thermal decomposition / conditions to be avoided:
Decomposition will not occur if used and stored according to specifications. Possibility of hazardous reactions No dangerous reactions known Incompatible materials:
Acids
Halogens
Oxidizing agents

Hazardous decomposition products: Metal oxide fume

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## SECTION 11. TOXICOLOGICAL INFORMATION

Information on toxicological effects
Acute toxicity:
LD/LC50 values that are relevant for classification:
Oral LD50 10000 mg/kg (mouse)
5000 mg/kg (rat)
Primary irritant effect:
on the skin: May cause irritation
on the eye: May cause irritation
Sensitization: No sensitizing effects known.
Additional toxicological information:
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.
No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.
The Registry of Toxic Effects of Chemical Substances (RTECS) contains acute and/or other multiple dose toxicity data for components in this product.

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## SECTION 12. ECOLOGICAL INFORMATION

Toxicity
Acquatic toxicity: No data available
Persistence and degradability No data available
Behavior in environmental systems:
Bioaccumulative potential No data available
Mobility in soil No data available
Additional ecological information:
Do not allow material to be released to the environment without official permits. Results of PBT and vPvB assessment
PBT: N/A
vPvB: N/A
Other adverse effects No data available

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## SECTION 13. DISPOSAL CONSIDERATIONS

Waste treatment methods
Recommendation Consult official regulations to ensure proper disposal. Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.

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## SECTION 14. TRANSPORT INFORMATION

UN-Number
DOT, ADR, IMDG, IATA UN3089
UN proper shipping name
DOT, IMDG, IATA METAL POWDER, FLAMMABLE, N.O.S. (Bismuth) ADR 3089 METAL POWDER, FLAMMABLE, N.O.S. (Bismuth)

Transport hazard class(es)
DOT, IMDG, IATA
Class 4.1 Flammable solids, self-reactive substances
and solid desensitised explosives.
Label 4.1
ADR
Class 4.1 (F3) Flammable solids, self-reactive
substances and solid desensitised explosives
Label 4.1
Packing group
DOT, ADR, IMDG, IATA III
Environmental hazards:
Marine pollutant: No
Special precautions for user Warning: Flammable solids, self-reactive substances and solid desensitised explosives
Danger code (Kemler): 40
Transport in bulk according to Annex II of
MARPOL73/78 and the IBC Code N/A
UN "Model Regulation": UN3089, METAL POWDER, FLAMMABLE, N.O.S.(Bismuth), 4.1, III

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## SECTION 15. REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture
Product related hazard informations:
Observe the general safety regulations when handling chemicals
Hazard symbols:
F Highly flammable
Risk phrases:
11 Highly flammable.
Safety phrases:
33 Take precautionary measures against static discharges.
National regulations
All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.
All components of this product are listed on the Canadian Domestic Substances List (DSL).
Information about limitation of use: For use only by technically qualified individuals.
Other regulations, limitations and prohibitive regulations
REACH - Pre-registered substances Substance is listed.
Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

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## 16. OTHER INFORMATION

Safety Data Sheet according to Regulation (EC) No. 1907/2006 (REACH). The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. American Elements shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. COPYRIGHT 1997-2022 AMERICAN ELEMENTS. LICENSED GRANTED TO MAKE UNLIMITED PAPER COPIES FOR INTERNAL USE ONLY.