



MATERION

1. Chemical and company identification

Name of chemical (Product name)	Beryllium Fluoride
Company name	Materion Brush Inc.
Address	6070 Parkland Boulevard Mayfield Heights, OH 44124 United States
Contact person	Theodore Knudson
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Emergency telephone number	+1.216.383.4019
Reference number	M12

2. Hazards identification

GHS classification

Physical hazards	The product is not classified according to GHS.	
Health hazards	Acute toxicity, oral	Category 3
	Acute toxicity, inhalation	Category 2
	Skin corrosion/irritation	Category 2
	Serious eye damage/eye irritation	Category 2
	Sensitization, respiratory	Category 1
	Sensitization, skin	Category 1
	Carcinogenicity	Category 1B
	Specific target organ toxicity, single exposure	Category 3 respiratory tract irritation
	Specific target organ toxicity, repeated exposure	Category 1 (Respiratory system)
Environmental hazards	Hazardous to the aquatic environment, long-term hazard	Category 2

GHS label elements

Symbols



Signal words

Danger

Hazard statement

Toxic if swallowed. Causes skin irritation. Fatal if inhaled. Causes serious eye irritation. May cause an allergic skin reaction. May cause cancer. May cause respiratory irritation. Causes damage to organs (respiratory system) through prolonged or repeated exposure by inhalation. Toxic to aquatic life.

Precautionary statement

Prevention

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Minimize dust generation and accumulation. Avoid breathing dust. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Contaminated work clothing must not be allowed out of the workplace. Wear protective gloves/protective clothing/eye protection/face protection. In case of inadequate ventilation wear respiratory protection.

Response

If swallowed: Immediately call a poison center/doctor. If on skin: Wash with plenty of water. If inhaled: Remove person to fresh air and keep comfortable for breathing. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If exposed or concerned: Get medical advice/attention. If skin irritation or rash occurs: Get medical advice/attention. If experiencing respiratory symptoms: Call a poison center/doctor. Wash contaminated clothing before reuse.

Storage

Store locked up. Store in a well-ventilated place. Keep container tightly closed.

Disposal	Dispose of contents/container in accordance with local/regional/national/international regulations.
Other hazards which do not result in classification	None known.
Supplemental information	For further information, please contact the Product Stewardship Department at +1.216.383.4019.
Main symptoms and emergency overview	
Main symptoms	Sensitization. Irritating to mouth, throat, and stomach. Coughing. Discomfort in the chest. Shortness of breath. Skin irritation. Rash. Edema. Jaundice. Liver enlargement. Proteinuria. Prolonged exposure may cause chronic effects.
Emergency overview	DANGER
	Fatal if inhaled. Very toxic. Harmful if absorbed through skin. Harmful in contact with eyes. Causes damage to organs. Cancer hazard. May cause sensitization by inhalation and skin contact. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction. Possible reproductive hazard. Danger of serious damage to health by prolonged exposure. Dangerous for the environment if discharged into watercourses.

3. Composition/information on ingredients

Substance or mixture	Substance			
		Gazette notification		
Components	CAS Number	ENCS no.	ISHL no.	Concentration (%)
Beryllium Fluoride	7787-49-7	(1)-1031	(1)-1031	100

Synonym(s) Beryllium Difluoride

Chemical formula Be-F₂ (7787-49-7)

4. First aid measures

If inhaled	If symptoms develop move victim to fresh air. For breathing difficulties, oxygen may be necessary. Breathing difficulty caused by inhalation of particulate requires immediate removal to fresh air. If breathing has stopped, perform artificial respiration and obtain medical help.
If on skin	Take off contaminated clothing and wash before reuse. Thoroughly wash skin cuts or wounds to remove all particulate debris from the wound. Seek medical attention for wounds that cannot be thoroughly cleansed. Treat skin cuts and wounds with standard first aid practices such as cleansing, disinfecting and covering to prevent wound infection and contamination before continuing work. Obtain medical help for persistent irritation. Material accidentally implanted or lodged under the skin must be removed.
If in eyes	Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention if symptoms persist.
If swallowed	If swallowed, seek medical advice immediately and show this container or label. Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person.
Most important symptoms/effects, acute and delayed	May cause allergic skin reaction. May cause allergic respiratory reaction. Prolonged exposure may cause chronic effects.
Protection of first-aid responders	If exposed or concerned: get medical attention/advice. Get medical attention if symptoms occur. Wash contaminated clothing before reuse. As supplied, there is no immediate medical risk with beryllium products in article form. First aid measures provided are related to particulate containing beryllium.

Notes to physician

Treatment of Chronic Beryllium Disease: There is no known treatment which will cure chronic beryllium disease. Prednisone or other corticosteroids are the most specific treatment currently available. They are directed at suppressing the immunological reaction and can be effective in diminishing signs and symptoms of chronic beryllium disease. In cases where steroid therapy has had only partial or minimal effectiveness, other immunosuppressive agents, such as cyclophosphamide, cyclosporine, or methotrexate, have been used. In view of the potential side effects of all the immunosuppressive medications, including steroids such as prednisone, they should be used only under the direct care of a physician. Other treatment, such as oxygen, inhaled steroids or bronchodilators, may be prescribed by some physicians and can be effective in selected cases. In general, treatment is reserved for cases with significant symptoms and/or significant loss of lung function. The decision about when and with what medication to treat is a judgment situation for individual physicians.

In their 2014 official statement on the Diagnosis and Management of Beryllium Sensitivity and Chronic Beryllium Disease, the American Thoracic Society states that "it seems prudent for workers with BeS to avoid all future occupational exposure to beryllium."

The effects of continued low exposure to beryllium are unknown for individuals who are sensitized to beryllium or who have a diagnosis of chronic beryllium disease. It is generally recommended that persons who are sensitized to beryllium or who have CBD terminate their occupational exposure to beryllium.

5. Fire-fighting measures

Extinguishing media

The product is non-combustible. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Extinguishing media to avoid

Do not use water to extinguish fires around operations involving molten metal due to the potential for steam explosions.

Special fire fighting procedures

Move containers from fire area if you can do so without risk. Water runoff can cause environmental damage.

Protection of fire-fighters

Firefighters should wear full protective clothing including self contained breathing apparatus. Wear suitable protective equipment.

Specific methods

Pressure-demand self-contained breathing apparatus must be worn by firefighters or any other persons potentially exposed to the particulate released during or after a fire.

6. Accidental release measures

Personal precautions, protective equipment and emergency measures

Wear appropriate protective equipment and clothing during clean-up.

Environmental precautions

Avoid release to the environment. In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground.

Methods or materials for containment and cleaning up

Clean up in accordance with all applicable regulations.

7. Handling and storage

Handling

Technical measures (e.g. Local and general ventilation)

Not available.

Safe handling advice

Not available.

Hygiene measures

Handle in accordance with good industrial hygiene and safety practice.

Storage

Safe storage conditions

Not available.

Safe packaging materials

Keep in original container.

8. Exposure controls/personal protection

Occupational exposure limits

Japan. OELs - ISHL. (Workplace Environment Assessment Standards)

Material	Type	Value
Beryllium Fluoride (CAS 7787-49-7)	TLV	0.001 mg/m ³

Japan. OELs - JSOH (Japan Society of Occupational Health: Recommendation of Occupational Exposure Limits)

Material	Type	Value
Beryllium Fluoride (CAS 7787-49-7)	TWA	0.002 mg/m ³

Biological limit values

ACGIH Biological Exposure Indices

Material	Value	Determinant	Specimen	Sampling Time
Beryllium Fluoride (CAS 7787-49-7)	3 mg/l	Fluoride	Urine	*
	2 mg/l	Fluoride	Urine	*

* - For sampling details, please see the source document.

Engineering measures

VENTILATION: Good general ventilation (typically 10 air changes per hour) 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.

Whenever possible, the use of local exhaust ventilation or other engineering controls is the preferred method of controlling exposure to airborne particulate. Where utilized, exhaust inlets to the ventilation system must be positioned as close as possible to the source of airborne generation. Avoid disruption of the airflow in the area of a local exhaust inlet by equipment such as a man-cooling fan. Check ventilation equipment regularly to ensure it is functioning properly. Provide training on the use and operation of ventilation to all users. Use qualified professionals to design and install ventilation systems.

WET METHODS: Machining operations are usually performed under a liquid lubricant/coolant flood which assists in reducing airborne particulate. However, the cycling through of machine coolant containing finely divided particulate in suspension can result in the concentration building to a point where the particulate may become airborne during use. Certain processes such as sanding and grinding may require complete hooded containment and local exhaust ventilation. Prevent coolant from splashing onto floor areas, external structures or operators' clothing. Utilize a coolant filtering system to remove particulate from the coolant.

WORK PRACTICES: Develop work practices and procedures that prevent particulate from coming in contact with worker skin, hair, or personal clothing. If work practices and/or procedures are ineffective in controlling airborne exposure or visual particulate from deposition on skin, hair, or clothing, provide appropriate cleaning/washing facilities. Procedures should be written that clearly communicate the facility's requirements for protective clothing and personal hygiene. These clothing and personal hygiene requirements help keep particulate from being spread to non-production areas or from being taken home by the worker. Never use compressed air to clean work clothing or other surfaces.

Fabrication processes may leave a residue of particulate on the surface of parts, products or equipment that could result in employee exposure during subsequent material handling activities. As necessary, clean loose particulate from parts between processing steps. As a standard hygiene practice, wash hands before eating or smoking.

HOUSEKEEPING: Use vacuum and wet cleaning methods for particulate removal from surfaces. Be certain to de-energize electrical systems, as necessary, before beginning wet cleaning. Use vacuum cleaners with high efficiency particulate air (HEPA). Do not use compressed air, brooms, or conventional vacuum cleaners to remove particulate from surfaces as this activity can result in elevated exposures to airborne particulate. Follow the manufacturer's instructions when performing maintenance on HEPA filtered vacuums used to clean hazardous materials.

Personal protective equipment

Respiratory protection

When airborne exposures exceed or have the potential to exceed the occupational exposure limits, approved respirators must be used as specified by an Industrial Hygienist or other qualified professional. Respirator users must be medically evaluated to determine if they are physically capable of wearing a respirator. Quantitative and/or qualitative fit testing and respirator training must be satisfactorily completed by all personnel prior to respirator use. Users of tight fitting respirators must be clean shaven on those areas of the face where the respirator seal contacts the face. Use pressure-demand airline respirators when performing jobs with high potential exposures such as changing filters in a baghouse air cleaning device.

Hand protection

Wear gloves to prevent contact with particulate or solutions. Wear gloves to prevent metal cuts and skin abrasions during handling.

Eye protection

Wear approved safety glasses, goggles, face shield and/or welder's helmet when risk of eye injury is present, particularly during operations that generate dust, mist or fume.

Skin and body protection

Personal protection equipment should be chosen according to the CEN standards and in discussion with the supplier of the personal protective equipment. Protective overgarments or work clothing must be worn by persons who may become contaminated with particulate during activities. Skin contact with this material may cause, in some sensitive individuals, an allergic dermal response. Particulate that becomes lodged under the skin has the potential to induce sensitization and skin lesions.

9. Physical and chemical properties

Appearance

Physical state

Solid.

Form

Solid. Various shapes.

Color

Clear. Off-white.

Odor

Not available.

Odor threshold

Not applicable.

pH

Not applicable.

Melting point/Freezing point

1031 °F (555 °C)

Boiling point, initial boiling point, and boiling range

2120 °F (1160 °C)

Flash point

Not applicable.

Combustion characteristics (solid, gas)

Not applicable.

Upper/lower flammability or explosive limits

Flammability limit - lower (%)

Not applicable.

Flammability limit - upper (%)

Not applicable.

Explosive limit - lower (%)

Not applicable.

Explosive limit - upper (%)

Not applicable.

Vapor pressure

< 0.0000001 kPa at 25 °C

Vapor density

Not applicable.

Evaporation rate

Not applicable.

Specific gravity

1.99 at 25 °C

Solubility(ies)

Solubility (water)

Not applicable.

Partition coefficient (n-octanol/water)

Not available.

Auto-ignition temperature

Not applicable.

Decomposition temperature

Not applicable.

Viscosity (Coefficient of viscosity)

Not applicable.

Other information

Density

1.99 g/cm³ estimated at 25 °C

Explosive properties	Not explosive.
Flash point class	Not applicable.
Molecular formula	Be-F2
Molecular weight	47.01 g/mol
Oxidizing properties	Not oxidizing.
Relative density	Not applicable.

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Conditions to avoid	Contact with incompatible materials. Avoid dust formation. Contact with acids. Contact with alkalis.
Incompatible materials	Strong acids, alkalies and oxidizing agents.
Hazardous decomposition products	No hazardous decomposition products are known.

11. Toxicological information

Acute toxicity	May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause allergic skin reaction.
Skin corrosion/irritation	Not likely, due to the form of the product.
Serious eye damage/eye irritation	Harmful in contact with eyes.
Respiratory or skin sensitization	
Japan Society for Occupational Health: Respiratory sensitizer	
Beryllium Fluoride (CAS 7787-49-7)	1 Known respiratory sensitizer.
Japan Society for Occupational Health: Skin sensitizer	
Beryllium Fluoride (CAS 7787-49-7)	2 Probable skin sensitizer.
Respiratory sensitization	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Skin sensitization	May cause an allergic skin reaction.
Germ cell mutagenicity	Due to lack of data the classification is not possible.
Carcinogenicity	Cancer hazard.
IARC Monographs. Overall Evaluation of Carcinogenicity	
Beryllium Fluoride (CAS 7787-49-7)	1 Carcinogenic to humans.
Japan Society for Occupational Health: Carcinogen	
Beryllium Fluoride (CAS 7787-49-7)	1 Carcinogenic to humans.
Reproductive toxicity	Not classified.
Specific target organ toxicity - single exposure	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Specific target organ toxicity - repeated exposure	May cause damage to organs (respiratory system) through prolonged or repeated exposure by inhalation.
Aspiration hazard	Due to lack of data the classification is not possible.
Other information	Symptoms may be delayed.

12. Ecological information

Ecotoxicity	Not available.
Persistence and degradability	No data is available on the degradability of this product.
Bioaccumulation	Not available.
Mobility in soil	Not available.
Hazardous to the ozone layer	Not available.

13. Disposal considerations

Residual waste	Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
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Contaminated packaging

Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

Local disposal regulations

Material should be recycled if possible. Disposal recommendations are based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal. When this product as supplied is to be discarded as waste, it does not meet the definition of a RCRA waste under 40 CFR 261.

14. Transport information**IATA**

UN number	1566
UN proper shipping name	Beryllium compound, n.o.s.
Transport hazard class(es)	
Class	6.1(PGI, II)
Subsidiary risk	-
Packing group	II
Environmental hazards	No.
ERG Code	6L
Special precautions for user	Not available.
Other information	
Passenger and cargo aircraft	Allowed with restrictions.
Cargo aircraft only	Allowed with restrictions.

IMDG

UN number	1566
UN proper shipping name	BERYLLIUM COMPOUND, N.O.S.
Transport hazard class(es)	
Class	6.1(PGI, II)
Subsidiary risk	-
Packing group	II
Environmental hazards	
Marine pollutant	No.
EmS	F-A, S-A
Special precautions for user	Not available.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.

IATA; IMDG**National regulations**

Follow regulation in section 15 for domestic transportation.

Emergency Response Guide Number

154

15. Regulatory information**Industrial Safety and Health Act****Specified substances regulation**

Class 1 designated chemical substances
BERYLLIUM AND ITS COMPOUNDS

Notifiable substances

BERYLLIUM AND ITS COMPOUNDS

Table 9 Ordinance No. VI

Labeling substances

BERYLLIUM AND ITS COMPOUNDS

Table 3-1 Ordinance No. 6

Poisonous and Deleterious Substances Control Act

Specified poisonous substances

Not regulated.

Poisonous substances

Not regulated.

Deleterious substances

Not regulated.

Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc.

Class I specified chemical substances

Not regulated.

Class II specified chemical substances

Not regulated.

Monitoring chemical substances

Not regulated.

Priority Assessment Chemical Substances (PACs)

Not regulated.

Reporting Exempted Substances

Not regulated.

Law concerning Pollutant Release and Transfer Register

Specified class 1 substances (substance name, ordinance number and content)

BERYLLIUM AND ITS COMPOUNDS Ordinance No. 394 (Beryllium Fluoride)

Class 1 substances (substance name, ordinance number and content)

HYDROGEN FLUORIDE AND ITS WATER Ordinance No. 374 (Beryllium Fluoride)
SOLUBLE SALTS

Class 2 substances (substance name, ordinance number and content)

Not regulated.

Ship Safety Law, Dangerous Goods Marine Transport and Storage Rule Toxic substances

Air Law, Enforcement Rule Toxic substances

Explosives Control Act

Not regulated.

Water Pollution Control Act

FLUORINE AND ITS COMPOUNDS (TOTAL F)

Sewage Act

FLUORINE AND ITS COMPOUNDS-DISCHARGE TO RIVER 8 MG/L
(AS F)

FLUORINE AND ITS COMPOUNDS-DISCHARGE TO SEA 15 MG/L
(AS F)

16. Other information

Bibliography

HSDB® - Hazardous Substances Data Bank
IARC Monographs. Overall Evaluation of Carcinogenicity
National Toxicology Program (NTP) Report on Carcinogens
Japan Society for Occupational Health, Recommendation of Occupational Exposure Limits
Japan Chemical Industry Association (JCIA) GHS Guideline, June 2012
JIS Z 7252:2014 Classification of chemicals based on "Globally Harmonized System of Classification and Labelling of Chemicals (GHS)"
JIS Z 7253:2012 Hazard communication of chemicals based on GHS – Labelling and Safety Data Sheet (SDS)

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Other information

Date change.