1. Chemical and company identification

Name of chemical (Product name)	**Lead Fluoride (PbF2)**

Supplier's company name, address and phone number

Company name	Materion Electronic Materials
Address	6070 Parkland Blvd Mayfield Heights, Ohio 44124 United States
Contact person	Product Stewardship Director
Telephone	1.216.383.4019
e-mail address	Materion-PS@materion.com
Emergency telephone number	See Section 16
Materion Code	1LU
Reference number	1LU

2. Hazards identification

GHS classification

Physical hazards	The product is not classified according to GHS.	
Health hazards	Serious eye damage/eye irritation	Category 2
	Carcinogenicity	Category 1B
	Reproductive toxicity	Category 1A
	Specific target organ toxicity, single exposure	Category 1 (blood, central nervous system, kidney)
	Specific target organ toxicity, single exposure	Category 3 respiratory tract irritation
	Specific target organ toxicity, repeated exposure	Category 1 (blood, bone, central nervous system, kidney)
Environmental hazards	The product is not classified according to GHS.	

GHS label elements

Pictograms

Signal words	Danger
Hazard statement	Causes serious eye irritation. May cause respiratory irritation. May cause cancer. May damage fertility or the unborn child. Causes damage to organs (blood, central nervous system, kidney). Causes damage to organs (blood, bone, central nervous system, kidney) through prolonged or repeated exposure.

Precautionary statement

Prevention	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe dust/fume/gas/mist/vapors/spray. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Wear protective gloves/protective clothing/eye protection/face protection.
Response	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: Call a POISON CENTER/doctor. If eye irritation persists: Get medical advice/attention.
Storage	Store in a well-ventilated place. Keep container tightly closed. Store locked up.
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 100% of the substance consists of component(s) of unknown acute hazards to the aquatic environment. 100% of the substance consists of component(s) of unknown long-term hazards to the aquatic environment.
For further information, please contact the Product Stewardship Department at +1.800.862.4118.

Main symptoms and emergency overview

Main symptoms Narcosis. Behavioral changes. Decrease in motor functions. Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. May cause respiratory irritation. Edema. Prolonged exposure may cause chronic effects.

Emergency overview Causes damage to organs. May cause cancer. Causes serious eye irritation. May cause irritation to the respiratory system. May cause reproductive effects. The material as sold in solid form is generally not considered hazardous. However, if the process involves grinding, melting, cutting or any other process that causes a release of dust or fumes, hazardous levels of airborne particulate could be generated.

3. Composition/information on ingredients

Substance or mixture Substance

		Gazette notification		
Chemical name or generic name	**CAS Number**	**ENCS no.**	**ISHL no.**	**Concentration (%)**
Lead Fluoride	7783-46-2	(1)-337	(1)-337	100

Chemical formula F2-Pb (7783-46-2)

4. First aid measures

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 off with soap and water. Get medical attention if irritation develops and persists.

If in eyes Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

If swallowed Rinse mouth. Get medical attention if symptoms occur.

Most important symptoms/effects, acute and delayed Narcosis. Behavioral changes. Decrease in motor functions. Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. May cause respiratory irritation. Edema. Prolonged exposure may cause chronic effects.

Protection of first-aid responders IF exposed or concerned: Get medical advice/attention. If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.

Notes to physician Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed.

5. Fire-fighting measures

Extinguishing media Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).

Extinguishing media to avoid Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards During fire, gases hazardous to health may be formed.

Special fire fighting procedures Move containers from fire area if you can do so without risk.

Protection of fire-fighters Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

General fire hazards No unusual fire or explosion hazards noted.

Specific methods Use standard firefighting procedures and consider the hazards of other involved materials.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

Environmental precautions Avoid discharge into drains, water courses or onto the ground.

Methods and materials for containment and cleaning up

Prevent entry into waterways, sewer, basements or confined areas.

Large Spills: Stop the flow of material, if this is without risk. Following product recovery, flush area with water.

Small Spills: Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use. Put material in suitable, covered, labeled containers. For waste disposal, see section 13 of the SDS.

7. Handling and storage

Handling

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

Provide adequate ventilation.

Safe handling advice

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid contact with eyes. When using, do not eat, drink or smoke. Pregnant or breastfeeding women must not handle this product. Should be handled in closed systems, if possible. Wash hands thoroughly after handling. Observe good industrial hygiene practices. Use personal protection recommended in Section 8 of the SDS.

Contact avoidance measures

For further information, please refer to section 10 of the SDS.

Hygiene measures

Observe any medical surveillance requirements. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

Storage

Safe storage conditions

Store locked up. Keep container tightly closed. Store away from incompatible materials (see Section 10 of the SDS).

Safe packaging materials

Store in original tightly closed container.

8. Exposure controls/personal protection

Control parameters

Follow standard monitoring procedures.

Occupational exposure limits

Japan. OELs - ISHL. Working Environment Measurement Standards, Ministry of Labor Notice No. 79 of September 1, 1988, as amended

Material	Type	Value
Lead Fluoride (CAS 7783-46-2)	TLV	0.05 mg/m3

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

Material	Type	Value
Lead Fluoride (CAS 7783-46-2)	TWA	0.03 mg/m3

Biological limit values

Japan. BELs - JSOH (Japan Society of Occupational Health) Recommendation of Occupational Exposure Limits Based on Biological Monitoring

Material	Value	Determinant	Specimen	Sampling Time
Lead Fluoride (CAS 7783-46-2)	800 µg/l	Protoporphyrin	Blood	*
	2000 µg/l	Protoporphyrin	Reduction from individual baseline activity in red blood cells	*
	150 µg/l	Lead	Blood	*

Japan. BELs - JSOH (Japan Society of Occupational Health) Recommendation of Occupational Exposure Limits Based on Biological Monitoring

Material	Value	Determinant	Specimen	Sampling Time
	5 mg/l	δ-Aminolevulinic acid	Urine	*

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

Engineering measures Provide adequate local exhaust ventilation to maintain worker exposure below exposure limits. 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. Provide eyewash station.

Personal protective equipment

Respiratory protection In case of insufficient ventilation, wear suitable respiratory equipment.

Hand protection Wear appropriate chemical resistant gloves.

Eye protection Wear safety glasses with side shields (or goggles).

Skin and body protection Wear suitable protective clothing. Use of an impervious apron is recommended.

9. Physical and chemical properties

Physical state Solid.

Form Solid.

Color Not available.

Odor Not available.

Melting point/freezing point 1515.2 °F (824 °C)

Boiling point, initial boiling point, and boiling range 2359.4 °F (1293 °C)

Combustibility Not available.

Lower and upper explosion limit / flammability limit

Explosive limit - lower (%) Not available.

Explosive limit - upper (%) Not available.

Flash point Not available.

Auto-ignition temperature Not available.

Decomposition temperature Not available.

pH Not available.

Kinematic viscosity Not available.

Solubility(ies)

Solubility (water) Not available.

Partition coefficient (n-octanol/water) (log value) Not available.

Vapor pressure <0.0000001 kPa (77 °F (25 °C))

Density and/or relative density

Density 8.44 g/cm3 estimated

Relative density Not available.

Vapor density Not available.

Particle characteristics Not available.

Other information

Explosive properties Not explosive.

Molecular formula F2-Pb

Molecular weight 245.2 g/mol

Oxidizing properties Not oxidizing.

Specific gravity 8.45

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 No dangerous reaction known under conditions of normal use.

Conditions to avoid Contact with incompatible materials.

Incompatible materials Strong oxidizing agents.

Hazardous decomposition products No hazardous decomposition products are known.

11. Toxicological information

Acute toxicity 100% of the substance consists of component(s) of unknown acute dermal toxicity.

Product	Species	Test Results
Lead Fluoride (CAS 7783-46-2)		
Acute		
Oral		
LD50	Rat	3031 mg/kg

Skin corrosion/irritation Prolonged skin contact may cause temporary irritation.

Serious eye damage/eye irritation Causes serious eye irritation.

Respiratory or skin sensitization

Respiratory sensitization Not a respiratory sensitizer.

Skin sensitization This product is not expected to cause skin sensitization.

Germ cell mutagenicity No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity May cause cancer.

ACGIH Carcinogens

Lead Fluoride (CAS 7783-46-2) A3 Confirmed animal carcinogen with unknown relevance to humans.
A4 Not classifiable as a human carcinogen.

Japan Society for Occupational Health: Carcinogen

Lead Fluoride (CAS 7783-46-2) 2B Possibly carcinogenic to humans.

NTP Report on Carcinogens

Lead Fluoride (CAS 7783-46-2) Reasonably Anticipated to be a Human Carcinogen.

Reproductive toxicity May damage fertility or the unborn child.

Specific target organ toxicity - single exposure Causes damage to organs (blood, central nervous system, kidney). May cause respiratory irritation.

Specific target organ toxicity - repeated exposure Causes damage to organs (blood, bone, central nervous system, kidney) through prolonged or repeated exposure.

Aspiration hazard Not an aspiration hazard.

12. Ecological information

Ecotoxicity The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Persistence and degradability No data is available on the degradability of this product.

Bioaccumulation No data available.

Mobility in soil No data available.

Hazardous to the ozone layer No data available.

Other hazardous effects No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Residual waste	Dispose of in accordance with local regulations. 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).
Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.
Local disposal regulations	Contract with a disposal operator licensed by the Law on Disposal and Cleaning. Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations. When your own wastewater treatment plant is not available, collect entire waste and then charge to a licensed industrial waste management professional with manifests for industrial waste.

14. Transport information

IATA

UN number	2291
UN proper shipping name	Lead compound, soluble, n.o.s. (Lead Fluoride)
Transport hazard class(es)	
Class	6.1
Subsidiary risk	-
Packing group	III
Environmental hazards	Yes
ERG Code	6L
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
Other information	
Passenger and cargo aircraft	Allowed with restrictions.
Cargo aircraft only	Allowed with restrictions.

IMDG

UN number	2291
UN proper shipping name	LEAD COMPOUND, SOLUBLE, N.O.S. (Lead Fluoride), MARINE POLLUTANT
Transport hazard class(es)	
Class	6.1
Subsidiary risk	-
Packing group	III
Environmental hazards	
Marine pollutant	Yes
EmS	F-A, S-A
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not applicable.
General information	IMDG Regulated Marine Pollutant.

IATA; IMDG

Marine pollutant

National regulations	Follow regulation in section 15 for domestic transportation.
Emergency Response Guide Number	151

15. Regulatory information

Industrial Safety and Health Act

Rules for the Prevention of Lead Poisoning

LEAD COMPOUNDS S~PB~C

Notifiable substances

Not regulated.

Labeling substances

Not regulated.

SDS and Risk Assessment

Not regulated.

Poisonous and Deleterious Substances Control Act

Specified poisonous substances

Not regulated.

Poisonous substances

Not regulated.

Deleterious substances

Lead compounds, excluding trilead tetraoxide, hydroxy lead(II) carbonate, and lead(II) sulfate

Act on the Regulation of Manufacture and Evaluation of Chemical Substances

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 until March 31, 2023

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

Lead compounds (As Pb) Ordinance No. 305 (Lead Fluoride)

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

Hydrogen fluoride and its water soluble salts (As F) Ordinance No. 374 (Lead Fluoride)

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

Not regulated.

Law concerning Pollutant Release and Transfer Register from April 1, 2023

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

Not regulated.

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

Not regulated.

Class 2 substances (substance name, control 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.

Soil Pollution Control Law

Class 2 Specified harmful substance

Lead (II) fluoride

Cutoff for 2nd elution standard	0.3 MG/L Total Pb
Cutoff for ground water standard	0.01 MG/L Total Pb
Cutoff for soil content standard	150 MG/KG Total Pb
Cutoff for soil elution standard	0.01 MG/L Total Pb

Waste Management and Public Cleansing Act

DUST CONTAINING LEAD AND ITS COMPOUNDS

SLUDGE, SPENT ACID, AND WASTE ALKALI CONTAINING LEAD AND ITS COMPOUNDS

Air Pollution Control Act

LEAD AND ITS COMPOUNDS-BAKING FURNACE AND SMELTING FURNACE FOR MANUFACTURING GLASS USING LEAD OXIDES AS RAW MATERIALS

LEAD AND ITS COMPOUNDS-CALCINATION FURNACE, CONVERTER, SMELTING FURNACE AND DRYING FURNACE FOR REFINING COPPER, LEAD OR ZINC

LEAD AND ITS COMPOUNDS-SINTERING FURNACE AND BLAST FURNACE FOR REFINING COPPER, LEAD OR ZINC

LEAD AND ITS COMPOUNDS-SMELTING FURNACE, ETC., FOR SECONDARY REFINING OF LEAD FOR MANUFACTURING LEAD PIPE, SHEET, WIRE, LEAD STORAGE BATTERY OR LEAD PIGMENT

16. Other information

Bibliography	ACGIH Documentation of the Threshold Limit Values and Biological Exposure Indices HSDB® - Hazardous Substances Data Bank IARC Monographs. Overall Evaluation of Carcinogenicity Japan Chemical Industry Association (JCIA) GHS Guideline, June 2019 Japan Society for Occupational Health, Recommendation of Occupational Exposure Limits JIS Z 7252:2019 Classification of chemicals based on “Globally Harmonized System of Classification and Labelling of Chemicals (GHS)” JIS Z 7253:2019 Hazard communication of chemicals based on GHS - Labelling and Safety Data Sheet (SDS) National Toxicology Program (NTP) Report on Carcinogens
Further information	Transportation Emergency Call Chemtrec at: US: 800.424.9300 International: 703.741.5970 Spain: 900.868.538 Switzerland: 0800.564.402 Chemtrec's toll free, mobile-enabled number in Germany – 0800 1817059 South Korea Toll-free Number – 080-880-0468

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Revision information	This document has undergone significant changes and should be reviewed in its entirety.