



MATERION

1. Chemical and company identification

Name of chemical (Product name)	Lead Fluoride (PbF ₂)	
Company name	Materion Advanced Chemicals Inc.	
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Division	Milwaukee	
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Emergency telephone number	Chemtrec	800.424.9300
Materion Code	1LU	
Reference number	1LU	

2. Hazards identification

GHS classification	The product is not classified according to GHS.	
Physical hazards		
Health hazards	Serious eye damage/eye irritation	Category 2A
	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

Symbols



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 (respiratory system) 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 eye protection/face protection. 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 None.

Main symptoms and emergency overview

Main symptoms Behavioral changes. Decrease in motor functions. Narcosis. 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. Prolonged exposure may cause chronic effects.

3. Composition/information on ingredients

Substance or mixture Substance

Components	CAS Number	Gazette notification		
		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 Decrease in motor functions. Behavioral changes. Narcosis. 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 Use water spray to cool unopened containers.

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 measures 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.

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

Methods or materials for containment and cleaning up Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Absorb in vermiculite, dry sand or earth and place into containers. Prevent entry into waterways, sewer, basements or confined areas. Following product recovery, flush area with water.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use.

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. Avoid prolonged exposure. Pregnant or breastfeeding women must not handle this product. Should be handled in closed systems, if possible. When using, do not eat, drink or smoke. Wash hands thoroughly after handling. Observe good industrial hygiene practices.
Hygiene measures	Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking.

Storage

Safe storage conditions	Store locked up. Keep container tightly closed.
Safe packaging materials	Store in original tightly closed container.

8. Exposure controls/personal protection

Occupational exposure limits

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

Material	Type	Value
Lead Fluoride (CAS 7783-46-2)	TLV	0.05 mg/m ³

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

Material	Type	Value
Lead Fluoride (CAS 7783-46-2)	TWA	0.1 mg/m ³

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	*
	400 µg/l	Lead	Blood	*
	2000 µg/l	Protoporphyrin	Reduction from individual baseline activity in red blood cells	*
	5 mg/l	δ-Aminolevulinic acid	Urine	*

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

Engineering measures

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. Provide eyewash station.

Personal protective equipment

Respiratory protection	In case of insufficient ventilation, wear suitable respiratory equipment.
Hand protection	Wear appropriate chemical resistant gloves. Suitable gloves can be recommended by the glove supplier.
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

Appearance

Physical state	Solid.
Form	Solid.
Color	Not available.

Odor Not available.

pH Not available.

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

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

Flash point Not available.

Combustion characteristics (solid, gas) Not available.

Upper/lower flammability or explosive limits

Flammability limit - lower (%) Not available.

Flammability limit - upper (%) Not available.

Explosive limit - lower (%) Not available.

Explosive limit - upper (%) Not available.

Vapor pressure < 0.0000001 kPa at 25 °C

Vapor density Not available.

Specific gravity 8.45

Solubility(ies)

Solubility (water) Not available.

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

Auto-ignition temperature Not available.

Decomposition temperature Not available.

Viscosity (Coefficient of viscosity) Not available.

Other information

Density 8.44 g/cm³ estimated

Explosive properties Not explosive.

Molecular formula F₂-Pb

Molecular weight 245.2 g/mol

Oxidizing properties Not oxidizing.

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 May cause respiratory irritation.

Product	Species	Test Results
Lead Fluoride (CAS 7783-46-2)		
<u>Acute</u>		
<u>Oral</u>		
LD50	Mouse	3015 mg/kg
	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.	
IARC Monographs. Overall Evaluation of Carcinogenicity		
Lead Fluoride (CAS 7783-46-2)	2A Probably carcinogenic to humans.	
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		
Dispose in accordance with all applicable regulations.		
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. 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(PGIII)
Subsidiary risk	-
Packing group	III
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	2291
UN proper shipping name	LEAD COMPOUND, SOLUBLE, N.O.S. (Lead Fluoride), MARINE POLLUTANT
Transport hazard class(es)	
Class	6.1(PGIII)
Subsidiary risk	-
Packing group	III
Environmental hazards	
Marine pollutant	Yes
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.
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

Notifiable substances

LEAD AND LEAD COMPOUNDS, INORGANIC

Table 9 Ordinance No. 411

Labeling substances

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 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)

LEAD COMPOUNDS Ordinance No. 305 (Lead Fluoride)

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

HYDROGEN FLUORIDE AND ITS WATER Ordinance No. 374 (Lead 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.

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
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)

This safety data sheet was prepared in accordance with JIS Z 7253:2012.

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Revision information

Product and Company Identification: Product and Company Identification