



# SAFETY DATA SHEET

**MATERION**

## 1. Identification

**Product identifier** Thorium Fluoride

**Other means of identification**

SDS number 2BG

Materion Code 2BG

CAS number 13709-59-6

Synonyms Thorium tetrafluoride

### Manufacturer/Importer/Supplier/Distributor information

#### Manufacturer

**Company name** Materion Advanced Chemicals Inc.

**Address** 407 N 13th Street  
1316 W. St. Paul Avenue  
Milwaukee, WI 53233  
United States

**Telephone** 414.212.0290

**E-mail** advancedmaterials@materion.com

**Contact person** Laura Hamilton

**Emergency phone number** Chemtrec 800.424.9300

## 2. Hazard(s) identification

**Physical hazards** Not classified.

**Health hazards** Skin corrosion/irritation Category 2  
Serious eye damage/eye irritation Category 2A  
Germ cell mutagenicity Category 2  
Specific target organ toxicity, single exposure Category 3 respiratory tract irritation

**Environmental hazards** Not classified.

**OSHA defined hazards** Not classified.

### Label elements



**Signal word** Warning

**Hazard statement** Causes serious eye irritation. Causes skin irritation. May cause respiratory irritation. May cause harm to breast-fed children. May cause damage to organs through prolonged or repeated exposure. Suspected of damaging fertility or the unborn child.

**Precautionary statement**

**Prevention** Do not handle until all safety precautions have been read and understood. Do not breathe dust/fume/gas/mist/vapors/spray. Wear protective gloves/protective clothing/eye protection/face protection. Avoid contact during pregnancy/while nursing. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Observe good industrial hygiene practices.

**Response** If skin irritation occurs: Get medical advice/attention. If eye irritation persists: Get medical advice/attention.

**Storage** Store in a well-ventilated place. Keep container tightly closed. Store away from incompatible materials.

|  |  |
|--|--|
| <b>Disposal</b>                                  | Dispose of waste and residues in accordance with local authority requirements. Dispose of contents/container in accordance with local/regional/national/international regulations.               |
| <b>Hazard(s) not otherwise classified (HNOC)</b> | Radioactive. Radioactive material must be handled by qualified personnel in conformity with regulations appropriate to the government agency authorized to license the use of this radionuclide. |
| <b>Supplemental information</b>                  | For further information, please contact the Product Stewardship Department at +1.800.862.4118.   |

### 3. Composition/information on ingredients

#### Substances

| Chemical name    | Common name and synonyms | CAS number | %   |
|------------------|--------------------------|------------|-----|
| Thorium Fluoride | Thorium tetrafluoride    | 13709-59-6 | 100 |

\*Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.

### 4. First-aid measures

|   |  |
|---|--|
| <b>Inhalation</b>   | Move to fresh air. Notify radiation safety personnel immediately. Call a physician if symptoms develop or persist. The amount of material inhaled should be assessed and documented.                           |
| <b>Skin contact</b>   | Remove contaminated clothing immediately and wash skin with soap and water. Do not abrade skin. Always blot dry. Notify radiation safety personnel. Get medical attention if irritation develops and persists. |
| <b>Eye contact</b>  | Rinse with water. Remove contact lenses, if present and easy to do. Notify radiation safety personnel. Get medical attention if irritation develops and persists.  |
| <b>Ingestion</b>  | Notify radiation safety personnel immediately. Rinse mouth. Get medical attention if symptoms occur.   |
| <b>Most important symptoms/effects, acute and delayed</b>                     | Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. May cause respiratory irritation. Skin irritation.   |
| <b>Indication of immediate medical attention and special treatment needed</b> | Treat symptomatically.   |
| <b>General information</b>  | Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.   |

### 5. Fire-fighting measures

|  |  |
|--|--|
| <b>Suitable extinguishing media</b>                                  | Water fog. Foam. Dry chemical powder. Carbon dioxide (CO <sub>2</sub> ). Use fire-extinguishing media appropriate for surrounding materials.                 |
| <b>Unsuitable extinguishing media</b>                                | Do not use water jet as an extinguisher, as this will spread the fire. Use fire-extinguishing media appropriate for surrounding materials.                   |
| <b>Specific hazards arising from the chemical</b>                    | During fire, gases hazardous to health may be formed.  |
| <b>Special protective equipment and precautions for firefighters</b> | Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask. |
| <b>Fire fighting equipment/instructions</b>                          | Move containers from fire area if you can do so without risk.  |
| <b>Specific methods</b>  | Use standard firefighting procedures and consider the hazards of other involved materials.   |
| <b>General fire hazards</b>  | No unusual fire or explosion hazards noted.  |

### 6. Accidental release measures

|  |  |
|--|--|
| <b>Personal precautions, protective equipment and emergency procedures</b> | Keep unnecessary personnel away. Avoid contact with spilled material.  |
| <b>Methods and materials for containment and cleaning up</b>               | In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. Clean up in accordance with all applicable regulations. Stop the flow of material, if this is without risk. Following product recovery, flush area with water. |

**Environmental precautions**

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

**7. Handling and storage****Precautions for safe handling**

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid all personal contact. Avoid contact with skin. Avoid contact with eyes. Avoid contact during pregnancy/while nursing. Avoid prolonged exposure. When using, do not eat, drink or smoke. Use personal protective equipment as required. Wash thoroughly after handling. Avoid release to the environment.

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

Store locked up. Store in a place accessible by authorized persons only. Store in a cool, dry place out of direct sunlight. Store in original tightly closed container. Keep container tightly closed. Keep out of the reach of children. Store in accordance with local/regional/national/international regulation.

**8. Exposure controls/personal protection****Occupational exposure limits****US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)**

| Material                          | Type | Value                   |
|-----------------------------------|------|-------------------------|
| Thorium Fluoride (CAS 13709-59-6) | PEL  | 2.5 mg/m3 (as fluoride) |

**US. OSHA Table Z-2 (29 CFR 1910.1000)**

| Material                          | Type | Value     | Form  |
|-----------------------------------|------|-----------|-------|
| Thorium Fluoride (CAS 13709-59-6) | TWA  | 2.5 mg/m3 | Dust. |

**US. ACGIH Threshold Limit Values**

| Material                          | Type | Value     |
|-----------------------------------|------|-----------|
| Thorium Fluoride (CAS 13709-59-6) | TWA  | 2.5 mg/m3 |

**US. NIOSH: Pocket Guide to Chemical Hazards**

| Material                          | Type | Value     |
|-----------------------------------|------|-----------|
| Thorium Fluoride (CAS 13709-59-6) | TWA  | 2.5 mg/m3 |

**US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants**

| Material                          | Type | Value     |
|-----------------------------------|------|-----------|
| Thorium Fluoride (CAS 13709-59-6) | PEL  | 2.5 mg/m3 |

**Biological limit values****ACGIH Biological Exposure Indices**

| Material                          | Value  | Determinant | Specimen | Sampling Time |
|-----------------------------------|--------|-------------|----------|---------------|
| Thorium Fluoride (CAS 13709-59-6) | 3 mg/l | Fluoride    | Urine    | *             |
|                                   | 2 mg/l | Fluoride    | Urine    | *             |

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

**Appropriate engineering controls**

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.

Ensure adequate ventilation, especially in confined areas.

**Individual protection measures, such as personal protective equipment****Eye/face protection**

Wear safety glasses with side shields (or goggles).

|                                       |   |
|---------------------------------------|---|
| <b>Skin protection</b>                |   |
| <b>Hand protection</b>                | Wear appropriate chemical resistant gloves. Rubber gloves. Suitable gloves can be recommended by the glove supplier.  |
| <b>Other</b>                          | Wear suitable protective clothing. Lab coat.  |
| <b>Respiratory protection</b>         | In case of insufficient ventilation, wear suitable respiratory equipment.   |
| <b>Thermal hazards</b>                | Wear appropriate thermal protective clothing, when necessary.   |
| <b>General hygiene considerations</b> | No smoking, eating or drinking should be allowed in any area where radioactive materials are handled or stored. When using, do not eat, drink or smoke. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. |

## 9. Physical and chemical properties

### Appearance

|   |                                 |
|---|---------------------------------|
| <b>Physical state</b>                               | Solid.                          |
| <b>Form</b>   | Solid.                          |
| <b>Color</b>  | Not available.                  |
| <b>Odor</b>   | Not available.                  |
| <b>Odor threshold</b>                               | Not available.                  |
| <b>pH</b>   | Not available.                  |
| <b>Melting point/freezing point</b>                 | Not available.                  |
| <b>Initial boiling point and boiling range</b>      | Not available.                  |
| <b>Flash point</b>                                  | Not available.                  |
| <b>Evaporation rate</b>                             | Not available.                  |
| <b>Flammability (solid, gas)</b>                    | Not available.                  |
| <b>Upper/lower flammability or explosive limits</b> |                                 |
| <b>Flammability limit - lower (%)</b>               | Not available.                  |
| <b>Flammability limit - upper (%)</b>               | Not available.                  |
| <b>Explosive limit - lower (%)</b>                  | Not available.                  |
| <b>Explosive limit - upper (%)</b>                  | Not available.                  |
| <b>Vapor pressure</b>                               | < 0.0000001 kPa (77 °F (25 °C)) |
| <b>Vapor density</b>                                | Not available.                  |
| <b>Relative density</b>                             | Not available.                  |
| <b>Solubility(ies)</b>                              |                                 |
| <b>Solubility (water)</b>                           | Not available.                  |
| <b>Partition coefficient (n-octanol/water)</b>      | Not available.                  |
| <b>Auto-ignition temperature</b>                    | Not available.                  |
| <b>Decomposition temperature</b>                    | Not available.                  |
| <b>Viscosity</b>                                    | Not available.                  |
| <b>Other information</b>                            |                                 |
| <b>Explosive properties</b>                         | Not explosive.                  |
| <b>Molecular formula</b>                            | F4Th                            |
| <b>Molecular weight</b>                             | 308.03 g/mol                    |
| <b>Oxidizing properties</b>                         | Not oxidizing.                  |

## 10. Stability and reactivity

|   |   |
|---|---|
| <b>Reactivity</b>                         | The product is stable and non-reactive under normal conditions of use, storage and transport. |
| <b>Chemical stability</b>                 | Stable; however, may decompose if heated.   |
| <b>Possibility of hazardous reactions</b> | No dangerous reaction known under conditions of normal use.                                   |
| <b>Conditions to avoid</b>                | Contact with incompatible materials.  |
| <b>Incompatible materials</b>             | Strong oxidizing agents.  |
| <b>Hazardous decomposition products</b>   | No hazardous decomposition products are known.  |

## 11. Toxicological information

### Information on likely routes of exposure

|                     |  |
|---------------------|--|
| <b>Inhalation</b>   | May cause irritation to the respiratory system. Prolonged inhalation may be harmful. |
| <b>Skin contact</b> | Causes skin irritation.  |
| <b>Eye contact</b>  | Causes serious eye irritation.   |
| <b>Ingestion</b>    | Due to lack of data the classification is not possible.                              |

**Symptoms related to the physical, chemical and toxicological characteristics** Irritant effects.

### Information on toxicological effects

|  |   |
|--|---|
| <b>Acute toxicity</b>                    | May cause respiratory irritation.   |
| <b>Skin corrosion/irritation</b>         | Causes skin irritation.   |
| <b>Serious eye damage/eye irritation</b> | Causes serious eye irritation.  |
| <b>Respiratory or skin sensitization</b> |   |
| <b>Respiratory sensitization</b>         | Due to lack of data the classification is not possible.                         |
| <b>Skin sensitization</b>                | Due to lack of data the classification is not possible.                         |
| <b>Germ cell mutagenicity</b>            | Due to lack of data the classification is not possible.                         |
| <b>Carcinogenicity</b>                   | This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA. |

#### IARC Monographs. Overall Evaluation of Carcinogenicity

Thorium Fluoride (CAS 13709-59-6) 3 Not classifiable as to carcinogenicity to humans.

#### OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)

Not listed.

#### US. National Toxicology Program (NTP) Report on Carcinogens

Not listed.

|   |   |
|---|---|
| <b>Reproductive toxicity</b>                              | May cause harm to breastfed babies. Suspected of damaging fertility or the unborn child.                |
| <b>Specific target organ toxicity - single exposure</b>   | Respiratory tract irritation.   |
| <b>Specific target organ toxicity - repeated exposure</b> | May cause damage to organs through prolonged or repeated exposure.                                      |
| <b>Aspiration hazard</b>                                  | Due to lack of data the classification is not possible.   |
| <b>Chronic effects</b>                                    | May cause damage to organs through prolonged or repeated exposure. Prolonged inhalation may be harmful. |
| <b>Further information</b>                                | This product has no known adverse effect on human health.   |

## 12. Ecological information

|                                      |   |
|--------------------------------------|---|
| <b>Ecotoxicity</b>                   | Contains a substance which causes risk of hazardous effects to the environment. |
| <b>Persistence and degradability</b> | No data is available on the degradability of this product.                      |

|                                  |   |
|----------------------------------|---|
| <b>Bioaccumulative potential</b> | No data available.  |
| <b>Mobility in soil</b>          | No data available.  |
| <b>Other adverse effects</b>     | 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

|  |  |
|--|--|
| <b>Disposal instructions</b>                 | Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Radioactive waste must be handled in accordance with procedures established by your Radiation Safety Officer, NRC and other applicable regulations. |
| <b>Local disposal regulations</b>            | Dispose in accordance with all applicable regulations.   |
| <b>Hazardous waste code</b>                  | The waste code should be assigned in discussion between the user, the producer and the waste disposal company.   |
| <b>Waste from residues / unused products</b> | 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). Dispose of in accordance with local regulations.                         |
| <b>Contaminated packaging</b>                | 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.                               |

### 14. Transport information

|                                     |   |
|-------------------------------------|---|
| <b>DOT</b>                          |   |
| <b>UN number</b>                    | UN2912  |
| <b>UN proper shipping name</b>      | Radioactive material, low specific activity (LSA-I) non fissile or fissile-excepted   |
| <b>Transport hazard class(es)</b>   |   |
| <b>Class</b>                        | 7   |
| <b>Subsidiary risk</b>              | -   |
| <b>Label(s)</b>                     | 7   |
| <b>Packing group</b>                | Not available.  |
| <b>Special precautions for user</b> | Not available.  |
| <b>Special provisions</b>           | A56, T5, TP4, W7  |
| <b>Packaging exceptions</b>         | 421, 422, 428   |
| <b>Packaging non bulk</b>           | 427   |
| <b>Packaging bulk</b>               | 427   |
| <b>IATA</b>                         |   |
| <b>UN number</b>                    | UN2912  |
| <b>UN proper shipping name</b>      | Radioactive material, low specific activity (LSA-I) non-fissile or fissile excepted   |
| <b>Transport hazard class(es)</b>   |   |
| <b>Class</b>                        | 7   |
| <b>Subsidiary risk</b>              | -   |
| <b>Packing group</b>                | Not available.  |
| <b>Environmental hazards</b>        | No.   |
| <b>ERG Code</b>                     | 7L  |
| <b>Special precautions for user</b> | Not available.  |
| <b>IMDG</b>                         |   |
| <b>UN number</b>                    | UN2912  |
| <b>UN proper shipping name</b>      | RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-I) non fissile or fissile - excepted |
| <b>Transport hazard class(es)</b>   |   |
| <b>Class</b>                        | 7   |
| <b>Subsidiary risk</b>              | -   |
| <b>Packing group</b>                | Not available.  |
| <b>Environmental hazards</b>        |   |
| <b>Marine pollutant</b>             | No.   |
| <b>EmS</b>                          | F-I, S-S  |
| <b>Special precautions for user</b> | Not available.  |



## 15. Regulatory information

### US federal regulations

CERCLA/SARA Hazardous Substances - Not applicable.

All components are on the U.S. EPA TSCA Inventory List.  
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

### Toxic Substances Control Act (TSCA)

#### TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

### CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

### SARA 304 Emergency release notification

Not regulated.

### OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)

Not listed.

### Superfund Amendments and Reauthorization Act of 1986 (SARA)

#### SARA 302 Extremely hazardous substance

Not listed.

#### SARA 311/312 Hazardous chemical

Yes

#### Classified hazard categories

Skin corrosion or irritation  
Serious eye damage or eye irritation  
Germ cell mutagenicity  
Specific target organ toxicity (single or repeated exposure)

#### SARA 313 (TRI reporting)

Not regulated.

### Other federal regulations

#### Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

#### Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

#### Safe Drinking Water Act (SDWA)

Not regulated.

### US state regulations

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

#### California Proposition 65

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

## 16. Other information, including date of preparation or last revision

Issue date 05-22-2015

Revision date 03-26-2021

Version #

07

Further information

Emergency telephone numbers

Austria - VergiftungsInformationsZentrale, +431.406.43.43

Belgium - Centre Antipoisons - +070.245.245

Bulgaria - Телефон за спешни случаи / факс, +359.2.9154.409

Cyprus - +357.22405611

Czech Republic - Toxikologické informační středisko, +420.224.919.293

Denmark - Akuthjælp ved forgiftning, +82.12.12.12

Estonia - Mürgistusteabekeskuse, 16662

Finland - Myrkytystietokeskus, +(0)9.471.977

France - numéro ORFILA, +33.(0)1.45.42.59.59

Germany - GIZ-Nord Poisons Centre, +49.(0)551.383.1876

Greece - +30.210.64.79.286

Hungary - Az Egészségügyi Toxikológiai Tájékoztató Szolgálat, +36 1 476 6464

Iceland - +354.591.2000

Ireland - National Poisons Information Centre - +353.01.8092566

Italy - Istituto Superiore di Sanità, 064990.2423

Latvia - Valsts Toksikoloģijas centra Saindēšanās un zāļu informācijas centrs, +371.67042473

Liechtenstein - +423.236.61.95

Lithuania - Neatidėliotina informacija apsinuodijus, +370 5 236 20 52

Luxembourg - +352 42 59 91 600

Malta - 2545 0000

Netherlands - NVIC, 030-2748888

Norway - Giftinformasjonen, 22.59.13.00

Poland - Biuro ds. Substancji Chemicznych, +48 42 2538 424

Portugal - 808.250.143

Romania - Biroul RSI si Informare Toxicologica, 021.318.36.06

Slovakia - NTIC, +421.2.5477.4166

Slovenia - Kemična urad Republike Slovenije + 386.14.00.60.51

Spain - Servicio de Información Toxicológica, + 34.91.562.04.20

Sweden - 112

References

ACGIH

EPA: AQUIRE database

NLM: Hazardous Substances Data Base

US. IARC Monographs on Occupational Exposures to Chemical Agents

Disclaimer

Additional information is given in the Material Safety Data Sheet. Materion Advanced Chemicals Inc. cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use.

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