

# SAFETY DATA SHEET

Version 6.10  
Revision Date 01/02/2025  
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## SECTION 1. IDENTIFICATION

### 1.1 Product identifiers

Product name : Lithium fluoride  
Product Number : 237965  
Brand : Aldrich  
CAS-No. : 7789-24-4

### 1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances  
Uses advised against : The product is being supplied under the TSCA R&D Exemption (40 CFR Section 720.36). It is the recipient's responsibility to comply with the requirements of the R&D exemption. The product may not be used for a non-exempt commercial purpose under TSCA unless appropriate consent is granted in writing by MilliporeSigma.

### 1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.  
3050 SPRUCE ST  
ST. LOUIS MO 63103  
UNITED STATES  
Telephone : +1 314 771-5765  
Fax : +1 800 325-5052

### 1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

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## SECTION 2. HAZARDS IDENTIFICATION

### GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Acute toxicity (Oral) : Category 4  
Eye irritation : Category 2A

**GHS label elements**

Hazard pictograms :



Signal Word : Warning

 Hazard Statements : H302 Harmful if swallowed.  
 H319 Causes serious eye irritation.

 Precautionary Statements : **Prevention:**  
 P264 Wash skin thoroughly after handling.  
 P270 Do not eat, drink or smoke when using this product.  
 P280 Wear eye protection/ face protection.  
**Response:**  
 P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. Rinse mouth.  
 P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
 P337 + P313 If eye irritation persists: Get medical advice/ attention.  
**Disposal:**  
 P501 Dispose of contents/ container to an approved waste disposal plant.
**Other hazards**
 Weak hydrogen fluoride-releaser  
 Contact with acids liberates very toxic gas.
**SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS**

Substance / Mixture : Substance

**Components**

Chemical name	CAS-No.	Concentration (% w/w)
Lithium fluoride	7789-24-4	>= 90 - <= 100

Actual concentration is withheld as a trade secret

**SECTION 4. FIRST AID MEASURES**

General advice : Hydrofluoric (HF) acid burns require immediate and specialized first aid and medical treatment. Symptoms may be delayed up to 24 hours depending on the concentration of HF. After decontamination with water,

further damage can occur due to penetration/absorption of the fluoride ion. Treatment should be directed toward binding the fluoride ion as well as the effects of exposure. Skin exposures can be treated with a 2.5% calcium gluconate gel repeated until burning ceases. More serious skin exposures may require subcutaneous calcium gluconate except for digital areas unless the physician is experienced in this technique, due to the potential for tissue injury from increased pressure. Absorption can readily occur through the subungual areas and should be considered when undergoing decontamination. Prevention of absorption of the fluoride ion in cases of ingestion can be obtained by giving milk, chewable calcium carbonate tablets or Milk of Magnesia to conscious victims. Conditions such as hypocalcemia, hypomagnesemia and cardiac arrhythmias should be monitored for, since they can occur after exposure. Show this material safety data sheet to the doctor in attendance.

- If inhaled : After inhalation: fresh air.
- In case of skin contact : First treatment with calcium gluconate paste.
- In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower.
- In case of eye contact : After eye contact: rinse out with plenty of water. Call in ophthalmologist. Remove contact lenses.
- If swallowed : After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.
- Most important symptoms and effects, both acute and delayed : The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11
- Protection of first-aiders : For personal protection see section 8.
- Notes to physician : No data available

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## SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media : Water  
Foam  
Carbon dioxide (CO<sub>2</sub>)  
Dry powder

Unsuitable extinguishing : For this substance/mixture no limitations of extin-

media	guishing agents are given.
Specific hazards during fire fighting	: Combustible.  Mixture with combustible ingredients.  Development of hazardous combustion gases or vapours possible in the event of fire.
Hazardous combustion products	: Hydrogen fluoride  Lithium oxides
Specific extinguishing methods	: No data available
Further information	: Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.
Special protective equipment for fire-fighters	: In the event of fire, wear self-contained breathing apparatus.

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## SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	: Advice for non-emergency personnel: Avoid inhalation of dusts. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert. Advice for emergency responders: For personal protection see section 8.
Environmental precautions	: Do not let product enter drains.
Methods and materials for containment and cleaning up	: Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up dry. Dispose of properly. Clean up affected area. Avoid generation of dusts.

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## SECTION 7. HANDLING AND STORAGE

For precautions see section 2.2.

Further information on storage conditions : Tightly closed.  
Dry.  
Keep in a well-ventilated place.  
Keep locked up or in an area accessible only to qualified or authorized persons.

Materials to avoid : Do not store near acids.

Storage class : 6.1D, Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

Recommended storage temperature : Recommended storage temperature see product label.

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## SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Ingredients with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Lithium fluoride	7789-24-4	TWA	2.5 mg/m <sup>3</sup> (Fluorine)	OSHA Z-1
		TWA	2.5 mg/m <sup>3</sup> (Fluorine)	ACGIH

### Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
Lithium fluoride	7789-24-4	Fluoride (Fluorine)	Urine	Prior to shift (16 hours after exposure ceases)	2 mg/l	ACGIH BEI
		Fluoride (Fluorine)	Urine	End of shift (As soon as possible)	3 mg/l	ACGIH BEI

				after exposure ceases)		
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**Engineering measures** : No data available

**Personal protective equipment**

Respiratory protection : required when dusts are generated.

Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Recommended Filter type: : Filter type P2

The entrepreneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

**Hand protection**

Material : Nitrile rubber  
 Break through time : 480 min  
 Glove thickness : 0.11 mm  
 Protective index : Full contact  
 Manufacturer : KCL 741 Dermatril® L

Material : Nitrile rubber  
 Break through time : 480 min  
 Glove thickness : 0.11 mm  
 Protective index : Splash contact  
 Manufacturer : KCL 741 Dermatril® L

Remarks : This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Eye protection : Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).  
 Safety glasses

Skin and body protection : protective clothing

Hygiene measures : Change contaminated clothing. Preventive skin protection recommended. Wash hands after working with substance.

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## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : powder

Color : No data available

Odor : No data available

Odor Threshold : No data available  
pH : 7.0 - 8.5 (77 °F / 25 °C)  
Concentration: 0.26 g/l

Melting point/ range : 1553 °F / 845 °C

Boiling point/boiling range : No data available

Flash point : Not applicable

Evaporation rate : No data available

Flammability (solid, gas) : The product is not flammable.

Flammability (liquids) : No data available

Burning rate : No data available

Upper explosion limit /  
Upper flammability limit : No data available

Lower explosion limit /  
Lower flammability limit : No data available

Vapor pressure : No data available

Relative vapor density : No data available

Relative density : No data available

Density : 2.64 g/mL (77 °F / 25 °C)

Solubility(ies)  
Water solubility : ca. 0.3 g/l (68 °F / 20 °C)

Partition coefficient: n-octanol/water	:	No data available
Autoignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity, dynamic	:	No data available
Viscosity, kinematic	:	No data available
Flow time	:	No data available
Explosive properties	:	No data available
Oxidizing properties	:	No data available
Molecular weight	:	25.94 g/mol
Particle characteristics Particle size	:	No data available

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## SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	The following applies in general to flammable organic substances and mixtures: in correspondingly fine distribution, when whirled up a dust explosion potential may generally be assumed.
Reactivity	:	Contact with acids liberates very toxic gas.
Chemical stability	:	The product is chemically stable under standard ambient conditions (room temperature) .
Possibility of hazardous reactions	:	Violent reactions possible with: halogen-halogen compounds Generates dangerous gases or fumes in contact with: acids Generates dangerous gases or fumes in contact with: Acids
Conditions to avoid	:	Avoid moisture.  no information available
Incompatible materials	:	glass
Hazardous decomposition products	:	In the event of fire: see section 5



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## SECTION 11. TOXICOLOGICAL INFORMATION

### 11.1 Information on toxicological effects

#### Acute toxicity

LD50 Oral - Rat - male - 608 mg/kg

(OECD Test Guideline 401)

LD50 Inhalation - Rat - 4 h - > 15.57 mg/l - dust/mist

(OECD Test Guideline 403)

LD50 Dermal - Rat - > 2,000 mg/kg

(OECD Test Guideline 402)

Remarks: The value is given in analogy to the following substances: Lithium bromide

No data available

#### Skin corrosion/irritation

Skin - reconstructed human epidermis (RhE)

Result: No skin irritation

(OECD Test Guideline 439)

Skin - in vitro membrane barrier

Result: Not corrosive

(OECD Test Guideline 435)

#### Serious eye damage/eye irritation

Remarks: May irritate eyes.

(in analogy to similar products)

#### Respiratory or skin sensitization

in vivo assay - Guinea pig

Result: Not sensitising

(US-EPA)

#### Germ cell mutagenicity

No data available

Test Type: Ames test

Test system: Salmonella typhimurium

Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 471

Result: negative

Test Type: Ames test

Test system: Escherichia coli

Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 471

Result: negative

Test Type: Chromosome aberration test in vitro

Test system: Human lymphocytes

Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 473

Result: negative

Remarks: (in analogy to similar products)

Test Type: In vitro mammalian cell gene mutation test

Test system: mouse lymphoma cells

Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 476

Result: negative  
Remarks: (in analogy to similar products)

### **Carcinogenicity**

- IARC: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
- NTP: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
- OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

### **Reproductive toxicity**

No data available

### **Specific target organ toxicity - single exposure**

No data available

### **Specific target organ toxicity - repeated exposure**

No data available

### **Aspiration hazard**

No data available

## **11.2 Additional Information**

Fluoride ion can reduce serum calcium levels possibly causing fatal hypocalcemia. Fluoride ion can reduce serum calcium levels possibly causing fatal hypocalcemia., Cyanosis and t-wave inversion have occurred in the breast-fed infants of women receiving lithium carbonate therapy., Lithium and its compounds are possible teratogens by analogy to lithium carbonate which has equivocal human teratogenic data and positive animal teratogenic data., burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea, Vomiting, Large doses of lithium ion have caused dizziness and prostration, and can cause kidney damage if sodium intake is limited. Dehydration, weight loss, dermatological effects, and thyroid disturbances have been reported. Central nervous system effects that include slurred speech, blurred vision, sensory loss, ataxia, and convulsions may occur. Diarrhea, vomiting, and neuromuscular effects such as tremor, clonus, and hyperactive reflexes may occur as a result of repeated exposure to lithium ion. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Stomach - Irregularities - Based on Human Evidence

Stomach - Irregularities - Based on Human Evidence

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## **SECTION 12. ECOLOGICAL INFORMATION**

### **Ecotoxicity**

### **Components:**

### **Lithium fluoride:**

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The life science business of Merck operates as MilliporeSigma in the US and Canada

**MERCK**

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia): 152.37 mg/l  
 End point: Immobilization  
 Exposure time: 48 h  
 Remarks: (calculated)

Toxicity to algae/aquatic plants : NOEC (Desmodesmus subspicatus (green algae)): 25 mg/l  
 Exposure time: 72 h  
 Test Type: static test  
 Method: OECD Test Guideline 201  
 GLP: yes  
 Remarks: The value is given in analogy to the following substances:  
 The value is given in analogy to the following substances: Lithium chloride

ErC50 (Desmodesmus subspicatus (green algae)): > 400 mg/l  
 Exposure time: 72 h  
 Test Type: static test  
 Method: OECD Test Guideline 201  
 GLP: yes  
 Remarks: The value is given in analogy to the following substances:  
 The value is given in analogy to the following substances: Lithium chloride

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia): 14.1 mg/l  
 End point: reproduction rate  
 Exposure time: 21 d

### **Persistence and degradability**

#### **Components:**

##### **Lithium fluoride:**

Biodegradability : Remarks: No data available

### **Bioaccumulative potential**

#### **Components:**

##### **Lithium fluoride:**

Bioaccumulation : Remarks: No data available

### **Mobility in soil**

#### **Components:**

##### **Lithium fluoride:**

Stability in soil : Remarks: No data available

## Other adverse effects

### Product:

Ozone-Depletion Potential : Regulation: 40 CFR Protection of Environment; Part 82  
Protection of Stratospheric Ozone - CAA Section 602  
Class I Substances

Remarks: This product neither contains, nor was  
manufactured with a Class I or Class II ODS as de-  
fined by the U.S. Clean Air Act Section 602 (40 CFR  
82, Subpt. A, App.A + B).

### Components:

#### **Lithium fluoride:**

Additional ecological in- : No data available  
formation

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## SECTION 13. DISPOSAL CONSIDERATIONS

### **Disposal methods**

Waste from residues : Waste material must be disposed of in accordance  
with the national and local regulations. Leave chemi-  
cals in original containers. No mixing with other  
waste. Handle uncleaned containers like the product  
itself.

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## SECTION 14. TRANSPORT INFORMATION

### **International Regulations**

#### **IATA-DGR**

UN/ID No. : UN 3288  
Proper shipping name : Toxic solid, inorganic, n.o.s.  
(Lithium fluoride)  
Class : 6.1  
Packing group : III  
Labels : Division 6.1 - Toxic substances  
Packing instruction (cargo : 677  
aircraft)  
Packing instruction (pas- : 670  
senger aircraft)

#### **IMDG-Code**

UN number : UN 3288  
Proper shipping name : TOXIC SOLID, INORGANIC, N.O.S.  
(Lithium fluoride)  
Class : 6.1  
Packing group : III  
Labels : 6.1  
EmS Code : F-A, S-A

Marine pollutant : no

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**

Not applicable for product as supplied.

**National regulation**

**49 CFR Road**

UN/ID/NA number : UN 3288  
Proper shipping name : Toxic solid, inorganic, n.o.s.  
(Lithium fluoride)  
Class : 6.1  
Packing group : III  
Labels : Division 6.1 - Toxic substances  
ERG Code : 151  
Marine pollutant : no

Poison Inhalation Hazard : No

**Special precautions for user**

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

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**SECTION 15. REGULATORY INFORMATION**

**CERCLA Reportable Quantity**

This material does not contain any components with a CERCLA RQ.

**SARA 304 Extremely Hazardous Substances Reportable Quantity**

This material does not contain any components with a section 304 EHS RQ.

**SARA 302 Extremely Hazardous Substances Threshold Planning Quantity**

This material does not contain any components with a section 302 EHS TPQ.

**SARA 311/312 Hazards** : Acute Health Hazard  
Chronic Health Hazard

**SARA 313** : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

**Clean Air Act**

This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B). This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCOMI Intermediate or Final VOC's (40 CFR 60.489).

### **Clean Water Act**

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.

This product does not contain any Hazardous Chemicals listed under the U.S. Clean-Water Act, Section 311, Table 117.3.

This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307

This product does not contain any priority pollutants related to the U.S. Clean Water Act

### **US State Regulations**

#### **Massachusetts Right To Know**

No components are subject to the Massachusetts Right to Know Act.

#### **Maine Chemicals of High Concern**

Product does not contain any listed chemicals

#### **Vermont Chemicals of High Concern**

Product does not contain any listed chemicals

#### **Washington Chemicals of High Concern**

Product does not contain any listed chemicals

#### **The ingredients of this product are reported in the following inventories:**

TSCA : All substances listed as active on the TSCA inventory

#### **TSCA list**

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

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## **SECTION 16. OTHER INFORMATION**

### **Full text of other abbreviations**

ACGIH : USA. ACGIH Threshold Limit Values (TLV)  
ACGIH BEI : ACGIH - Biological Exposure Indices (BEI)  
OSHA Z-1 : USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants  
ACGIH / TWA : 8-hour, time-weighted average  
OSHA Z-1 / TWA : 8-hour time weighted average

AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Con-

centration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

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