

CANON OPTRON INC.

SDS Number: EA02

Product Name: AIF3

## SAFETY DATA SHEET

rev. 7.2 Date of Issue 2014/9/1  
Revised Date 2022/10/3

## SECTION 1 Chemicals and company identification

Product name	AIF3
Product code	EA02
Company name	CANON OPTRON INC.
Address	1744-1, Kanakubo, Yuki-shi, Ibaraki-ken, 307-0015 Japan
Section name	Sales Department
Telephone number	+81-296-21-3700
Fax number	+81-296-21-3770
Emergency telephone number	+81-296-21-3700
Use	Vacuum deposition material

## SECTION 2 Hazards identification

GHS Classification (A classification by JIS Z 7252 "classification methods such as chemical substances based on GHS")

Physical hazards	Explosives	Classification not possible
	Flammable gases	Not applicable
	Aerosols	Not applicable
	Oxidizing gases	Not applicable
	Gas under pressure	Not applicable
	Flammable liquids	Not applicable
	Flammable solids	Classification not possible
	Self-reactive substances and mixtures	Classification not possible
	Pyrophoric liquids	Not applicable
	Pyrophoric solids	Classification not possible
	Self-heating substances and mixtures	Classification not possible
	Substances and mixtures which, in contact with water, emit flammable gases	Classification not possible
	Oxidizing liquids	Not applicable
	Oxidizing solids	Classification not possible
	Organic peroxides	Classification not possible
	Corrosive to metals	Classification not possible
	Desensitize explosives	Classification not possible
Health hazards	Acute toxicity(oral)	Category 3
	Acute toxicity(dermal)	Classification not possible
	Acute toxicity (Inhalation: Gases)	Not applicable
	Acute toxicity (Inhalation: Vapors)	Classification not possible

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	Acute toxicity (Inhalation: Dusts and mists)	Classification not possible
	Skin corrosion/irritation	Classification not possible
	Serious eye damage/eye irritation	Category 2A
	Respiratory sensitization	Classification not possible
	Skin sensitization	Classification not possible
	Germ cell mutagenicity	Classification not possible
	Carcinogenicity	Classification not possible
	Reproductive toxicity	Category 2
	Reproductive toxicity, effects on or via lactation	Classification not possible
	Specific target organ toxicity(single exposure)	Category 3
	Specific target organ toxicity(repeated exposure)	Category 1
	Aspiration hazard	Classification not possible
Environmental hazards	Hazardous to the aquatic environment Short-term(acute)	Classification not possible
	Hazardous to the aquatic environment Long-term(chronic)	Classification not possible
	Hazardous to the ozone layer	Classification not possible
Label elements		
hazard Pictograms	Skull and crossbones	Health Hazard
		
Signal word	Danger	
Dangerous goods hazard information	Toxic if swallowed. Causes serious eye irritation. May cause respiratory irritation.	
Precautionary statements		
【Safety measures】	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe dust/fume/gas/mist/vapours/spray. Wash hands thoroughly after handling. Do not eat, drink or smoke when using this product. Wear Protective gloves/protective clothing/eye protection/face protection.	

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【First-aid measures】	IF SWALLOWED :Immediately call poison center or doctor/physician. 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 poison center or doctor/physician. If exposed or concerned: Get medical advice/attention. Get medical advice/attention if you feel unwell. Specific treatment . Rinse mouth. If eye irritation persists: Get medical advice/attention.
【Storage】	Store locked up.
【Disposal】	Dispose of contents/container in accordance with national regulations.
【Other hazards】	-

## SECTION 3 Composition/information on ingredients

Substance/Mixture	Substance
Chemical name	Aluminum fluoride
Chemical formula	AIF3
Concentration or concentration range	99.9%<
CAS No.	7784-18-1
TSCA Inventory	Aluminum fluoride (AIF3)
EINECS number	232-051-1
Radioactive information	Radioactive substances are not used as the material. Therefore, there is no reason that ionizing radiation would be generated.

## SECTION 4 First aid measures

Inhalation	Remove person to fresh air and keep comfortable for breathing. Get medical advice/attention if you feel unwell.
Skin contact	Take off immediately all contaminated clothing. Rinse affected areas with water/shower. IF ON SKIN :Wash with plenty of soap and water. If skin irritation or rash occurs: : Get medical advice/attention.
Eye contact	Rinse cautiously with water for several minutes.Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
Ingestion	Rinse mouth. Get medical advice/attention.
Most important symptoms and effects, both acute and delayed	Inhalation: Coughing, shortness of breath, sore throat. Skin contact: Pain, reddening.
Protection of first aiders	Rescuers, wear suitable protective equipment as the situation demands.
Special precautions for physicians	No data available

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## SECTION 5 Firefighting measures

Suitable extinguishing media	Water spray, foam fire extinguishing agent, powder fire extinguishing agent , carbon dioxide gas, dry sand such
Unsuitable extinguishing media	Because a fire might spread through the outskirts, It avoid direct stick irrigation.
Specific hazards	It is non-inflammable and itself does not burn, but releases irritating or toxic Hume (or gas) at the time of a fire because the product concerned contains halogen (F) in molecules.
Specific extinguishing methods	It move a container from the fire area if not dangerous. Eliminate all ignition sources if safe to do so.
Special protective equipment for firefighters	On the occasion of fire extinguishing work, It wear appropriate personal protective equipment and rescue suit.

## SECTION 6 Accidental release measures

Personal precautions, protective equipment, and emergency procedures	It isolate appropriate distance in all way promptly as a leak area. It prohibit the entrance except the person concerned. Ventilate Before delving into an enclosed area. Remove all sources of ignition.
Environmental precautions	It should not be released to the environment.
Methods and material for containment and cleaning up	It sweep the leak thing and gather you and collect it in an empty container and dispose it later. Methods and material for containment and cleaning up: Moisten with water to reduce dust in the air and prevent dispersion.
Secondary disaster prevention measures	Was covered with a plastic sheet to prevent scattering.

## SECTION 7 Handling and storage

Precautions for safe handling	
Technical measures	Take measures for equipment as described in "8. Exposure controls/personal protection" and wear protective equipment.
Safety handling precautions	Be sure to get the instruction manual before use. Do not handle until you read and understand all safety precautions. The use of appropriate personal protective equipment. Do not inhale dust, fumes, vapors, spray.
Avoidance of contact	Sodium, potassium, acid
Hygiene measures	Wash hands thoroughly after handling. Do not eat, drink or smoke when using this product.
Conditions for safe storage, including any incompatibilities	
Safe storage conditions	Store in a well-ventilated place. Keep container tightly closed. Store locked up.
Safety packaging material	It use the container which It can seal up without damage and the leak.

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## SECTION 8 Exposure controls/personal protection

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Permissible concentration

ACGIH

TLV-TWA: 2.5 mg/m<sup>3</sup>  
(fluoride)  
(2015 version)

Appropriate engineering controls

In the work shop which dust produces, It use a device, an apparatus sealed up by all means or a local ventilator.

Individual protection measures,  
such as personal protective  
equipment

Respiratory protection	Dustproof mask
Hand protection	Protective gloves
Eye/face protection	Dust-proof glasses
Skin protection	Protective clothing

## SECTION 9 Physical and chemical properties

Appearance

Physical state	Solid
Form	Pellets, granules
Colour	White
Odour	None

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Melting point/freezing point

1291°C

Boiling point or initial boiling point  
and boiling range

1272°C

Flammability

No data available

Upper/lower flammability or  
explosive limitsLEL:2.5 g/cm<sup>3</sup> (HSFS (2008))

Flash point

Noncombustibility

Auto-ignition temperature

Noncombustibility

Decomposition temperature

No data available

pH

4.5~5 (GESTIS (2015))

Kinematic viscosity

No data available

Solubility

Water

0.559 g/100 ml (25 °C)

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Other solvents	<i>Alcohol, acetone: Indissolubility acid, a base: Slightly soluble (HSDB (2015))</i>
Partition coefficient: n-octanol/water	<i>No data available</i>
Vapour pressure	<i>133 Pa (1238°C) (ICSC (2012))</i>
Density and/or relative density (Density)	<i>2.882 (25/4 °C) (NITE synthesis search (2015))</i>
Relative vapor density	<i>2.9 (air = 1) (HSFS (2008))</i>
Particle characteristics	<i>No data available</i>
Other information	<i>No data available</i>

## SECTION 10 Stability and reactivity

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Reactivity	<i>It is a non-inflammable solid. It dissolve in water just a little bit.</i>
Chemical stability	<i>No data available</i>
Possibility of hazardous reactions	<i>It react by contact with sodium and potassium intensely. By contact with Hume of acid and the acid, It produce toxic high Hume. It react with a compound containing air, the humidity and the active hydrogen intensely.</i>
Conditions to avoid	<i>Heating</i>
Incompatible materials	<i>Sodium, potassium, acid</i>
Hazardous decomposition products	<i>By the resolution by the heating, It produce Hume of the extremely harmful hydrogen fluoride.</i>

## SECTION 11 Toxicological information

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Acute toxicity(oral)	<i>Mouse LD50 value: 103 mg / kg</i>
Acute toxicity(dermal)	<i>No data available</i>
Acute toxicity (Inhalation: Gases)	<i>Solid (GHS definition)</i>
Acute toxicity (Inhalation: Vapours)	<i>Solid (GHS definition)</i>
Acute toxicity (Inhalation: Dusts and mists)	<i>The classification is not possible due to lack of data. Besides, there is the information of an LC50 value (4 hours) of 0.53 mg/L for rats (GESTIS (Access on June 2015)), but its source is unknown.</i>
Skin corrosion/irritation	<i>No data available</i>
Serious eye damage/irritation	<i>Because it is written that this substance is severely irritating to eyes (HSDB (Access on June 2015)) and severely irritating to tissues (HSDB (Access on June 2015)), it was classified in Category 2. Besides, it is also written in List 3 information that this substance is irritating to eyes (GESTIS (Access on June 2015)).</i>

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Respiratory or skin sensitization	<i>The classification is not possible due to lack of data. Besides, asthmatic signs by irritant particles were reported in the occupational exposure of handling this substance and aluminum sulfate (EHC 194 (1997)).</i>
Germ cell mutagenicity	<i>The classification is not possible due to lack of data. There are no in vivo data, and as for in vitro, a bacterial reverse mutation test was negative (NTP DB (Access on August 2015)).</i>
Carcinogenicity	<i>The classification is not possible due to lack of data. Besides, ACGIH classified aluminum metal and its insoluble compound, and fluorides in A4 respectively (ACGIH (7th, 2001) Fluorides, HSDB (Access on June 2015)).</i>
Reproductive toxicity	<i>Data usable for classification were not obtained from List 1 information source, but a teratogenicity test result is written in HSDB of List 2. It is reported that in a teratogenicity test in pregnant rats in inhalation exposure to this substance through a gestation period, increased pre-implantation mortality of fertilized ova at 0.03–0.2 mg/m<sup>3</sup> and fetal toxicity and teratogenicity at a higher concentration occurred, but there is no information on maternal toxicity (HSDB (Access on June 2015)). It is difficult to confirm the details of the original literature written in Russian (Lenchenko, V.G. et al. (1974)), but by considering that the report suggests serious reproductive toxicity effects such as embryonic death and malformation from an extremely low concentration, the substance was classified in Category 2 only from this one report in this hazard class.</i>
Specific target organ toxicity(single exposure)	<i>From the data that this substance is irritating to the respiratory tract and causes nasal bleeding and vomiting (HSDB (Access on June 2015)), it was classified in Category 3 (respiratory tract irritation).</i>
Specific target organ toxicity(repeated exposure)	<i>There are no data on this substance. This substance is used as an additive in aluminum refining. In an epidemiological survey of workers exposed to fluorides in aluminum refining, the majority of 107 employees exposed to relatively high concentrations (2.4–6.0 mg/m<sup>3</sup>) developed fluorosis after 10-year exposure and showed moderate to severe osteosclerosis with the limitation of dorsal spine mobility after 15 years (ACGIH (7th, 2001) Fluorides). Moreover, it is reported that workers in occupational exposure to fluorides did not show bone lesions at an average concentration of 2.65 mg/m<sup>3</sup>, but developed bone changes at an average concentration of 3.38 mg/m<sup>3</sup> (ACGIH (7th, 2001) Fluorides). Therefore, it was classified in Category 1 (bone). Besides, effects on teeth by this substance were not reported, but it became evident that excessive ingestion of fluorine affects mainly skeletal tissues (bones and teeth). On top of that, dental fluorosis only occurs in tooth developing stage from birth to 6 or 8 years of age unlike bones (IPCS 227 (2002)), and concentrations above 1.5 mg/L of the WHO Guideline value for drinking water quality carry an increased risk of dental fluorosis, and much higher concentrations could lead to skeletal fluorosis (WHO (2011) Guidelines for drinking-water quality, 4th ed.), therefore, it is thought that this substance possibly affects teeth in children.</i>
Aspiration hazard	<i>No data available</i>
Other information	<i>No data available</i>

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## SECTION 12 Ecological information

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## Toxicity

Hazardous to the aquatic environment Short-term(acute)	<i>No data available</i>
Hazardous to the aquatic environment Long-term(chronic)	<i>No data available</i>
Persistence and degradability	<i>No data available</i>
Bioaccumulative potential	<i>No data available</i>
Mobility in soil	<i>No data available</i>
Hazard to the ozone layer	<i>No data available</i>
Other adverse effects	<i>No data available</i>

## SECTION 13 Disposal considerations

Waste treatment methods	Process is contracted to industrial waste disposers who received approval of a prefectural governor.
Contaminated container and contaminated packaging	The container is recycled after being cleaned, or is appropriately processed according to the standards of related laws and regulations. When disposing of empty containers, the contents should be completely removed.

## SECTION 14 Transport information

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## International regulation

UN number	1759
UN proper shipping name	CORROSIVESOLID,N.O.S.
UN classification	8
Transport hazard class	Not applicable
Packing group	I
Hazardous to the aquatic environment	<i>No data available</i>
Maritime transport in bulk according to IMO instruments	<i>No data available</i>
Japanese laws and regulations	Refer to "15. Regulatory information."
Special precautions for users	Requires retention of yellow card when transporting. When transporting, protect from direct sunlight and take on cargo without breakage of container, corrosion and leakage. Do not stack heavy good thereupon.
Special Provisions	154



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## SECTION 15 Regulatory information (Japan)

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Occupational Safety and Health PRTR Law	<i>There is it in the case of an application or an application</i>
Poisonous and Deleterious Substances control Law	<i>Not applicable</i>
Labor Standards Act	<i>Not applicable</i>
Chemical substances control Law	<i>Not applicable</i>
Fire fighting Law	<i>Not applicable</i>
Air Pollution Control Act	<i>Not applicable</i>
Water Pollution Prevention Act	<i>There is it in the case of an application or an application</i>
Water Supply Act	<i>There is it in the case of an application or an application</i>
Sewerage Act	<i>There is it in the case of an application or an application</i>
Marine Pollution Prevention Law	<i>Not applicable</i>
Waste Management and Public Cleansing Act	<i>Not applicable</i>
Note	Ensure this material in compliance with federal requirements and ensure conformity to local regulations.

## SECTION 16 Other information

The Safety Data Sheet (SDS) has been prepared based on currently available materials, information and data, and may be revised based on new information. Further, the important points in the SDS are made for the purpose of normal handling.

When handling the user product in a specialized manner, take the appropriate safety measures for the application or method.

Further, Canon Optron Inc. has paid sufficient attention to the described contents of the SDS, but does not guarantee the accuracy of its contents.

The SDS prepared by our company includes all findings from our investigation for reference. Not applicable to all items listed.

## Literature Reference

[WEB site]

National Institute of Technology and Evaluation Homepage

Japan Advanced Information Center of Safety and Health Homepage

Ministry of Health, Labour and Welfare Homepage

[Regulatory review Tools]

ezCRIC (Japan Chemical Database Ltd)