

CANON OPTRON INC.

SDS Number: ES13
 Product Name: S4F(A, B)

SAFETY DATA SHEET

rev. 8.0 Date of Issue 2013/10/16
 Revised Date 2024/3/15

SECTION 1 Chemicals and company identification

Product name	S4F(A, B)
Product code	ES13
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
	Health hazards	Desensitize explosives
Acute toxicity(oral)		Classification not possible
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	Classification not possible
	Respiratory sensitization	Classification not possible
	Skin sensitization	Classification not possible
	Germ cell mutagenicity	Category 2
	Carcinogenicity	Category 1A
	Reproductive toxicity	Classification not possible
	Reproductive toxicity, effects on or via lactation	Classification not possible
	Specific target organ toxicity(single exposure)	Classification not possible
	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	Health Hazard	
		
Signal word	Danger	
Dangerous goods hazard information	Suspected of causing genetic defects. May cause cancer. Causes damage to organs through prolonged or repeated exposure Respiratory	
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.	
【First-aid measures】	If exposed or concerned: Get medical advice/attention. Get medical advice/attention if you feel unwell.	

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【Storage】	Store locked up.
【Disposal】	Dispose of contents/container in accordance with national regulations.
【Other hazards】	-

SECTION 3 Composition/information on ingredients

Substance/Mixture	Mixture	
Chemical name	Quartz	Aluminum oxide
Chemical formula	SiO ₂ (Quartz)	Al ₂ O ₃
Concentration or concentration range	SiO ₂ : 94- 96% Al ₂ O ₃ : 4- 6% Total = 100%	
CAS No.	14808-60-7	1344-28-1
TSCA Inventory	Quartz (SiO ₂)	Aluminum oxide (Al ₂ O ₃)
EINECS number	238-878-4	215-691-6
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	No data available
Protection of first aiders	Rescuers, wear suitable protective equipment as the situation demands.
Special precautions for physicians	No data available

SECTION 5 Firefighting measures

Suitable extinguishing media	This product itself is not flammable.
Unsuitable extinguishing media	No data available
Specific hazards	No data available

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Specific extinguishing methods	In the case of a fire in the periphery, the portable container is quickly moved to a safe place.
Special protective equipment for firefighters	Wear suitable protective equipment (gloves, glasses and a mask) in fire-fighting.

SECTION 6 Accidental release measures

Personal precautions, protective equipment, and emergency procedures	Protection equipment (specified as those in which the properties of the product are suitable) worn during operation so that airborne droplets, etc., do not adhere to the skin and dusts and gases are not absorbed.
Environmental precautions	The leakage may not directly flow into rivers or sewage.
Methods and material for containment and cleaning up	The leaked material is scooped up, or swept up and gathered to be recovered in a paper bag or a drum. After recovery, a small amount of the residue is absorbed in sediment, sawdust, etc.
Secondary disaster prevention measures	No data available

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	Handling work must be practiced in a room where there is a local or total ventilation facility.
Avoidance of contact	Refer to "10. Stability and reactivity."
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 locked up.
Safety packaging material	No data available

SECTION 8 Exposure controls/personal protection

	<u>SiO₂ (Quartz)</u>	<u>Al₂O₃</u>
Permissible concentration		
ACGIH	TLV-TWA: 0.025 mg/m ³ (respiratory fraction) (a crystalline silica, α-quartz and cristobalite) (2015 version)	TWA 1 mg/m ³ (R), STEL -

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Appropriate engineering controls Use sealed devices, equipment, or a local exhaust ventilation as much as possible.

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

	<u>SiO2 (Quartz)</u>	<u>Al2O3</u>
Melting point/freezing point	1610°C	2072°C
Boiling point or initial boiling point and boiling range	2230°C	2980°C
Flammability	No data available	No data available
Upper/lower flammability or explosive limits	Nonflammability (ICSC (2010))	No data available
Flash point	Noncombustibility	Noncombustibility
Auto-ignition temperature	Noncombustibility	Noncombustibility
Decomposition temperature	No data available	No data available
pH	No data available	No data available
Kinematic viscosity	No data available	No data available
Solubility		
Water	Insoluble	Insoluble
Other solvents	No data available	The slightly soluble in non-polar organic solvent
Partition coefficient: n-octanol/water	No data available	No data available
Vapour pressure	0 mmHg (20°C) (HSFS (2015))	0.073Pa (mp.)
Density and/or relative density (Density)	No data available ※ 1.3 ~ 1.9 (pellet) as S4F (A, B)	3.97

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Relative vapor density	No data available	No data available
Particle characteristics	No data available	No data available
Other information	No data available	No data available

SECTION 10 Stability and reactivity

SiO2 (Quartz)

Al2O3

Reactivity	No data available	No data available
Chemical stability	No data available	Stability
Possibility of hazardous reactions	It produce alkali hydroxide, hydrogen fluoride, hydrofluoric acid and a dangerous reaction.	Possibility of hazardous reaction is negligible.
Conditions to avoid	No data available	Generation of dust, diffusion.
Incompatible materials	No data available	Not applicable
Hazardous decomposition products	No data available	Not applicable

SECTION 11 Toxicological information

SiO2 (Quartz)

Al2O3

Acute toxicity(oral)	No data available	SPECIES: Rat ENDPOINT: LD50 VALUE: > 5000 mg/kg
Acute toxicity(dermal)	No data available	No data available
Acute toxicity (Inhalation: Gases)	Solid (GHS definition)	Solid (GHS definition)
Acute toxicity (Inhalation: Vapours)	Solid (GHS definition)	No data available
Acute toxicity (Inhalation: Dusts and mists)	No data available	No data available
Skin corrosion/irritation	No data available	No data available
Serious eye damage/irritation	No data available	No data available
Respiratory or skin sensitization	No data available	No data available

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Germ cell mutagenicity

As for in vivo, an hprt gene mutation test with alveolar epithelial cells of rats dosed by intratracheal instillation was positive, an hprt gene mutation test with the lung tissue of mice was negative though the method of administration was not specified, a micronucleus test with mice dosed intraperitoneally was negative, a chromosomal aberration test and a sister chromatid exchange test with human lymphocytes were positive though exposure methods were not specified, oxidative DNA damage tests with the lung and peripheral blood of rats were positive or negative, and DNA strand break tests with the epithelial lung cells of rats were positive (SIDS (2013), CICAD 24 (2000), DFGOT Vol. 14 (2000), IARC 68 (1997)). As for in vitro, mammalian cell gene mutation tests gave positive and negative results, micronucleus tests with mammalian cultured cells gave positive and negative results, and chromosomal aberration tests and sister chromatid exchange tests with mammalian cultured cells were negative (SIDS (2013), CICAD 24 (2000), DFGOT Vol. 14 (2000), IARC 68 (1997)). From the above, this substance was classified in Category 2 in accordance with the GHS classification guidance for the Japanese government. Besides, the genotoxicity of this substance is thought to be attributable to reactive oxygen species derived from this substance or from the inflammatory cells caused by this substance (SIDS (2013), IARC 100C (2012)).

The in vivo mutagenicity test has not been carried out, and in the in vitro mutagenicity test, we could only find the Ames test (negative). Therefore we presupposed that we could not classify it for the lack of data.

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Carcinogenicity

In the results of many epidemiological studies, a positive correlation between occupational exposure to crystalline silica containing this substance (quartz) and an increased risk of lung cancer was found. Also, in particular, even when the results of multiple studies were pooled, and different meta-analyses were conducted, a significant increase in the relative risk was shown consistently (IARC 100C (2012), SIDS (2013)). Accordingly, it is described that there is sufficient evidence for an increased risk of lung cancer in humans by inhalation exposure to crystalline silica dust with the shape of this substance (quartz) (IARC 100C (2012)).

Meanwhile, in experimental animals, in a 2-year test in which female and male rats were exposed by inhalation to 1 mg/m³ of this substance (mass median aerodynamic diameter (MMAD): 1.3 micrometers), and in a 83-week test in which female rats were exposed by nose inhalation to 12 mg/m³ of this substance (MMAD: 2.24 micrometers), significant increases in lung tumors were observed in the exposed group, and there were many adenocarcinomas as the histological type. Furthermore, also in a study in which female rats were exposed by nose inhalation to 6.1 and 30.6 mg/m³ of this substance (MMAD: 1.8 micrometers), a dose-dependent increase in lung tumors was observed, and squamous cell carcinoma was the most common in the histological type, and bronchiolo/alveolar epithelial carcinomas or adenomas were often observed (IARC 100C (2012)).

From the above, based on information on carcinogenicity in humans and experimental animals, in 1997, IARC classified it in Group 1 with regard to carcinogenicity in humans due to exposure to the dust of this substance, and even in a reevaluation in 2012, the classification result was not changed (IARC 68 (1997), IARC 100C (2012)). As for results of carcinogenicity classifications by other organizations, Japan Society for Occupational Health classified it in Group 1 (Recommendation of Occupational Exposure Limits (2015)), ACGIH has classified it in A2 since 2004 (ACGIH (7th, 2006)), and NTP classified Crystalline Silica (Respirable Size) as K (NTP RoC (13th, 2014)). Therefore, it was classified in Category 1A for this hazard class.

Not classified because of "A"

Reproductive toxicity

No data available

No data available

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Specific target organ toxicity(single exposure)	Classification not possible due to lack of data. Besides, the data on effects on the human respiratory organs used in the previous classification was short-term exposure data and not data on single-dose acute effects.	It was set as category 3 (respiratory irritation) from the statement of upper respiratory irritation (ICSC (2000)).
Specific target organ toxicity(repeated exposure)	In humans, in many epidemiological studies, effects on the respiratory organs (silicosis, lung cancer, pulmonary tuberculosis) due to occupational exposure to this substance were found. In addition, autoimmune diseases (scleroderma, rheumatoid arthritis, polyarthritis, mixed connective tissue disease, systemic lupus erythematosus, Sjogren's syndrome, polymyositis, fibrositis), chronic renal disease, and subclinical renal changes were also observed (SIDS (2013), CICAD 24 (2000), DFGOT vol. 14 (2000)). These kidney diseases are thought to be related to autoimmunity (SIDS (2013)). Likewise in experimental animals, fibrosis in the lung was found in repeated inhalation exposure tests with rats (SIDS (2013)). Therefore, it was classified in Category 1 (respiratory organs, immune system, kidney).	It was classified into Category 1 according the statement that by occupational exposure of aluminas, pulmonary fibrosis was occurred (EHC (1997)).
Aspiration hazard	No data available	No data available
Other information	No data available	

SECTION 12 Ecological information

SiO₂ (Quartz)Al₂O₃

Toxicity

Hazardous to the aquatic environment Short-term(acute)	From the test data on amorphous silica of 24-hour LL50 > 10,000 mg/L for crustacea (Daphnia magna) and 96-hour LL0 = 10,000 mg/L for fish (Danio rerio) (both SIDS, 2013), it was classified as "Not classified."	No data available
Hazardous to the aquatic environment Long-term(chronic)	No data available	No data available
Persistence and degradability	No data available	No data available
Bioaccumulative potential	No data available	No data available
Mobility in soil	No data available	No data available
Hazard to the ozone layer	No data available	No data available
Other adverse effects	No data available	No data available

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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

	<u>SiO2 (Quartz)</u>	<u>Al2O3</u>
International regulation		
UN number	Not applicable	Not applicable
UN proper shipping name	Not applicable	Not applicable
UN classification	Not applicable	Not applicable
Transport hazard class	Not applicable	Not applicable
Packing group	Not applicable	Not applicable
Hazardous to the aquatic environment	No data available	No data available
Maritime transport in bulk according to IMO instruments	No data available	No data available
Japanese laws and regulations	Land regulation information Not applicable Maritime regulatory information non-hazardous materials Aviation regulatory information non-hazardous materials	Land regulation information Not applicable Maritime regulatory information non-hazardous materials Aviation regulatory information non-hazardous materials
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.	When transporting, protect from direct sunlight and take on cargo without breakage of container, corrosion and leakage.
Special Provisions	-	-

SECTION 15 Regulatory information (Japan)

	<u>SiO2 (Quartz)</u>	<u>Al2O3</u>
Occupational Safety and Health Law	There is it in the case of an application or an application	Not applicable
PRTR Law	Not applicable	Not applicable
Poisonous and Deleterious Substances control Law	Not applicable	Not applicable
Labor Standards Act	There is it in the case of an application or an application	Not applicable
Chemical substances control Law	Not applicable	Not applicable

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Fire fighting Law	Not applicable	Not applicable
Air Pollution Control Act	Not applicable	Not applicable
Water Pollution Prevention Act	Not applicable	There is it in the case of an application or an application
Water Supply Act	Not applicable	There is it in the case of an application or an application
Sewerage Act	Not applicable	Not applicable
Marine Pollution Prevention Law	There is it in the case of an application or an application	Not applicable
Waste Management and Public Cleansing Act	Not applicable	Not applicable
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)