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SECTION	1 Chemicals and company identif	fication
P	roduct name	MgO
P	roduct code	EM04
С	company name	CANON OPTRON INC.
A	ddress	1744-1, Kanakubo, Yuki-shi, Ibaraki-ken, 307-0015 Japan
S	ection name	Sales Department
Т	elephone number	+81-296-21-3700
Fa	ax number	+81-296-21-3770
E	mergency telephone tumber	+81-296-21-3700
U	se	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 gase	Classification not possible s
	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)	Not classified
	Acute toxicity(dermal)	Classification not possible
	Acute toxicity (Inhalation: Gases)	Not applicable
	Acute toxicity (Inhalation: Vapors)	Classification not possible
	Acute toxicity (Inhalation: Dusts and mists)	Classification not possible

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	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	Classification not possible
	Reproductive toxicity, effects on or via lactation	Classification not possible
	Specific target organ toxicity(single exposure)	Category 3
	Specific target organ toxicity(repeated exposure)	Classification not possible
	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

Exclamation



Causes serious eye irritation.

May cause respiratory irritation.

Warning

Signal word

Dangerous goods hazard information

Precautionary statements

[Safety measures]

[First-aid measures]

Avoid breathing dust/fume/gas/mist/vapours/spray. Wash hands thoroughly after handling. Use only outdoors or in a well-ventilated area. Wear Protective glovess/protective clothing/eye protection/face protection.

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. Call poison center or doctor/physician if you feel unwell. If eye irritation persists: Get medical advice/attention.

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[Storage]	Store in a well-ventilated place. Keep container tightly closed. Store locked up.
【Disposal】	Dispose of contents/container in accordance with national regulations.
[Other hazards]	-

Substance/Mixture	Substance
Chemical name	Magnesium oxide
Chemical formula	MgO
Concentration or concentration range	99.9<
CAS No.	1309-48-4
TSCA Inventry	Magnesium oxide (MgO)
EINECS number	215-171-9
Radioactive information	Radioactive substances are not used as the material. Therefore, there is no reason that ionizing radiation would be generated.
CTION 4 First aid measures	
CTION 4 First aid measures Inhalation	Remove person to fresh air and keep comfortable for breathing. Get medical advice/attention if you feel unwell.
CTION 4 First aid measures Inhalation Skin contact	Remove person to fresh air and keep comfortable for breathing. Get medical advice/attention if you feel unwell. 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.
CTION 4 First aid measures Inhalation Skin contact Eye contact	Remove person to fresh air and keep comfortable for breathing. Get medical advice/attention if you feel unwell. 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. Rinse cautiously with water for several minutes.Remove contact lenses, if present and easy to do. Continue rising. If eye irritation persists:Get medical advice/attention.
CTION 4 First aid measures Inhalation Skin contact Eye contact Ingestion	Remove person to fresh air and keep comfortable for breathing. Get medical advice/attention if you feel unwell. 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. Rinse cautiously with water for several minutes.Remove contact lenses, if present and easy to do. Continue rising. If eye irritation persists:Get medical advice/attention. Rinse mouth. Get medical advice/attention.
CTION 4 First aid measures Inhalation Skin contact Eye contact Ingestion Most important symptoms and effects, both acute and delayed	Remove person to fresh air and keep comfortable for breathing. Get medical advice/attention if you feel unwell. 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. Rinse cautiously with water for several minutes.Remove contact lenses, if present and easy to do. Continue rising. If eye irritation persists : Get medical advice/attention. Rinse mouth. Get medical advice/attention. No data available
CTION 4 First aid measures Inhalation Skin contact Eye contact Ingestion Most important symptoms and effects, both acute and delayed Protection of first aiders	Remove person to fresh air and keep comfortable for breathing. Get medical advice/attention if you feel unwell. 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. Rinse cautiously with water for several minutes.Remove contact lenses, if present and easy to do. Continue rising. If eye irritation persists:Get medical advice/attention. Rinse mouth. Get medical advice/attention. No data available Rescuers, wear suitable protective equipment as the situation demands.

SECTION 5 Firefighting measures	
Suitable extinguishing media	It uses a water mist, dry chemicals, fire foam, carbon dioxide depending on neighboring fires.
Unsuitable extinguishing media	Because a fire might spread through the outskirts, It avoid direct stick irrigation.
Specific hazards	In the case of fires, a toxic decomposition product may occur.
Specific extinguishing methods	It performs the fire fighting from windward. Restrict access to the area around the fire location to persons other than those involved with the fire. It moves a container from the fire area if not dangerous.
Special protective equipment for firefighters	On the occasion of fire extinguishing work, it wears appropriate personal protective equipment and rescue suit.
SECTION 6 Accidental release measures	
	The second se

Personal precautions, protective equipment, and emergency procedures	It prohibits the entrance except the person concerned. The worker wears appropriate personal protective equipment (in item of "8.revelation prevention and protection measures" reference) and avoids eyes, contact and inhalation to skin. Personal protective equipment for the individual, A mask with filter for the particle depending on density out of the air.
Environmental precautions	It avoids an outflow to the environmental average of the product to have possibilities to influence neighboring environment.
Methods and material for containment and cleaning up	The prohibition of handling and eating and drinking in neighboring of the storage area. It prevents the inflow to a drainage, a sewer, a basement or the closedown place. It sweeps it and puts the material which it shed in a container. When you may moisten it, it sweeps it after moistening it in order to avoid dust and puts it.
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	Use it only at the outdoors or a good place of the ventilation. It prevents diffusion of the dust.
Avoidance of contact	No contact with halogen-containing substances and strong 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	You lock it, and keep it Keep it at a good place of the ventilation. Sealing up a container. It establishes the facilities of illumination necessary it stores danger, detriment in the storage area or to handle it and the ventilation. It avoids direct rays of the sun and keeps it in the cool and dark space. It separates it from strong acid. Drying.



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	Safety packaging material	It uses the container which it can seal up without damage and the leak.
SECTION 8	Exposure controls/personal p	protection
		MgO
Pe	rmissible concentration	
	ACGIH	TLV-TWA: 10 mg/m² of (II) (magnesium oxide) (2015 version)
Ap	propriate engineering controls	In the work shop which dust produces, It use a device, an apparatus sealed up by all means or a local ventilator.
Inc su eq	lividual protection measures, ch as personal protective uipment	
	Respiratory protection	Dustproof mask
	Hand protection	Protective gloves
	Eye/face protection	Dust-proof glasses
	Skin protection	Protective clothing
SECTION 9 Ap	Physical and chemical proper pearance	Solid
	Fnysical state	
	Colour	
	Odour	None
		<u>MgO</u>
Me	elting point/freezing point	2800°C
Bo an	iling point or initial boiling point d boiling range	3600°℃
Fla	ammability	No data available
Up ex	per/lower flammability or plosive limits	No data available
Fla	ash point	Noninflammability (ICSC (2010))
Au	to-ignition temperature	Noninflammability (ICSC (2010))
De	composition temperature	No data available
рH		10.3 (20 degrees Celsius, saturated solution) (GESTIS (2015))
Kir	nematic viscosity	No data available
So	lubility	
	Water	Slightly soluble in water. (ICSC (2010))
	Other solvents	Soluble in acid and ammonium salt solutions. Insoluble in ethanol (HSDB (2015)).

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Partition coefficient: n− octanol∕water	No data available
Vapour pressure	0 mmHg (20°C) (NITE (2015))
Density and/or relative density	MIN3.2 ,MAX3.75 (WebKis-Plus (2015))
(Density)	※ (granular product) 3.58 2.1-2.3 (pellet) as MgO
Relative vapor density	No data available
Particle characteristics	No data available
Other information	No data available

SECTION 10 Stability and reactivity

<u>MgO</u>

Reactivity	Noncombustibility
Chemical stability	No data available
Possibility of hazardous reactions	There is a risk of explosion due to contact with aluminum powder, aniline perchlorate, magnesium powder, or sulfur during heating. Produces dangerous reactions with ammonia, strong acid, bromine pentafluoride, chlorine trifluoride, and phosphorus pentachloride. Reaction with phosphorus pentachloride is accompanied by incandescence. Contact with halogen-containing substances produces dangerous reactions or ignition.
Conditions to avoid	No data available
Incompatible materials	There is a risk of explosion due to contact with aluminum powder, aniline perchlorate, magnesium powder, or sulfur during heating. Produces dangerous reactions with ammonia, strong acid, bromine pentafluoride, chlorine trifluoride, and phosphorus pentachloride. Reaction with phosphorus pentachloride is accompanied by incandescence. Contact with halogen-containing substances produces dangerous reactions or
Hazardous decomposition products	ignition. No data available
Hazardous decomposition products	Contact with halogen-containing substances produces dangerous reactions or ignition. No data available

SECTION 11 Toxicological information

<u>MgO</u> Acute toxicity(oral) From reported LD50 values of 3,870 mg/kg (males) and 3,990 mg/kg (females) for rats (HSDB (Access on June 2015)) Acute toxicity(dermal) No data available Acute toxicity (Inhalation: Gases) Solid (GHS definition) Acute toxicity (Inhalation: Solid (GHS definition) Vapours) Acute toxicity (Inhalation: Dusts No data available and mists) Skin corrosion/irritation No data available Based on the information that a slight irritation of the eye was observed in 95 Serious eye damage/irritation workers exposed to the dust of this substance (an unknown concentration) (ACGIH (7th, 2003)), it was classified in Category 2.

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Respiratory or skin sensitization	No data available
Germ cell mutagenicity	The classification is not possible due to lack of data. There is no in vivo data. As for in vitro, it is reported that a bacterial reverse mutation test was negative (ACGIH (7th, 2003), HSDB (Access on June 2015)).
Carcinogenicity	As for humans, it is reported that excess cancers occurred in multiple organs by combined occupational exposure to this substance and others, and specific tumors formed in exposure to this substance were the lip, stomach, and lung cancers based on the standardized incidence ratio (SIR). However, it is described that the interpretation of this result is limited because the number of subjects were small and the level and duration of exposure to magnesium oxide were unknown (ACGIH (7th, 2003)). Besides, there is no evidence of carcinogenicity in humans by an inhalation route of magnesium oxide dust or fumes. It is pointed out that the increased frequency of lung cancer observed in welders in the past is likely caused by exposure to hexavalent chromium, not magnesium oxide (DFGOT vol. 2 (1991)). As for experimental animals, it is described that the substance was intratracheally applied in hamsters at a dose of 2mg/week for 30 weeks and observed for up to 100 weeks and as a result, the number of histiocytic lymphomas increased (ACGIH (7th, 2003)). However, there is no carcinogenicity test report according to the standard guidelines. From the above, ACGIH classified this substance in A4 in carcinogenicity. Also in this classification, the substance was classified as "Classification not possible in this hazard class due to lack of data.
Reproductive toxicity	No data available
Specific target organ toxicity(single exposure)	It is reported that this substance is irritating to the respiratory tract (ACGIH (7th, 2003), DFGOT vol. 2 (1991), HSDB (Access on June 2015)), but no other acute effects were reported. From the above, the substance was classified in Category 3 (respiratory tract irritation).
Specific target organ toxicity(repeated exposure)	As for humans, a fume fever by occupational exposure was reported. However, it is described that the exposure assessment in this plant was insufficient for assessing it is due to the effects to this substance alone. (ACGIH (7th, 2003)) There is no useful information on experimental animals. Therefore, the substance was classified as "Classification not possible."
Aspiration hazard	No data available

SECTION 12 Ecological information

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

International regulation	
UN number	Not applicable
UN proper shipping name	Not applicable
UN classification	Not applicable
Transport hazard class	Not applicable
Packing group	Not applicable
Hazardous to the aquatic environment	No data available
Maritime transport in bulk according to IMO instruments	No data available
Japanese lows and regulations	No data available
Special precautions for users	Requires retention of yellow card when transporting. 。 Ensure that the container is not damaged or leaking.
	Ensure that loads are prevented from collapsing. Conduct packaging labeling and transportation in accordance with applicable
	laws and regulations.
	Avoid direct sunlight.
	Refer to "Accidental release measures."
Special Provisions	-

SECTION 15 Regulatoly information (Japan)

	<u>MgO</u>
Occupational Safety and Health Law	No data available
PRTR Law	No data available
Poisonous and Deleterious Substances control Law	No data available
Labor Standards Act	No data available
Chemical substances control Law	No data available
Fire fighting Law	No data available
Air Pollution Control Act	No data available
Water Pollution Prevention Act	No data available
Water Supply Act	No data available
Sewerage Act	No data available
Marine Pollution Prevention Law	No data available
Waste Management and Public Cleansing Act	No data available
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)