



MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Material name MORUNDUM™ A, NP-C, SBT, SHOCOAT™ K-11, K-13
Version # 01
Issue date 02-22-2011
CAS # 1344-28-1
SDS No CE-US602EN
Product use Industrial use.
Manufacturer/Supplier SHOWA DENKO K.K.
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2. Hazards Identification

Physical state Solid.
Appearance Grains. Powder.
Emergency overview WARNING
Causes eye and respiratory tract irritation.
OSHA regulatory status This product is hazardous according to OSHA 29 CFR 1910.1200.
Potential health effects
Routes of exposure Inhalation. Ingestion. Skin contact. Eye contact.
Eyes Causes eye irritation. May cause redness and pain.
Skin Dust may irritate skin.
Inhalation Causes respiratory tract irritation.
Ingestion May cause discomfort if swallowed.
Target organs Eye. Skin. Respiratory tract. Lungs.
Chronic effects Frequent inhalation of dust over a long period of time increases the risk of developing lung diseases. Possible cancer hazard - may cause cancer based on animal data.
Signs and symptoms Coughing. Eye may become red, tear, and become painful.
Potential environmental effects The product contains a substance which may cause long-term adverse effects in the aquatic environment.

3. Composition / Information on Ingredients

Components	CAS #	Percent
Aluminum oxide (Al ₂ O ₃)	1344-28-1	96.5
Titanium dioxide (TiO ₂)	13463-67-7	2.3
Silicon oxide (SiO ₂)	7631-86-9	0.5

Composition comments The product is a substance with impurities. Main component: Aluminum oxide (Al₂O₃). Above concentrations are representative values. All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First Aid Measures

First aid procedures
Eye contact Dust in the eyes: Do not rub eyes. Immediately flush eye(s) with plenty of water. Remove contact lenses, if present and easy to do. Get medical attention if irritation persists after washing.
Skin contact Flush skin thoroughly with water. Get medical attention if irritation develops and persists.
Inhalation Move injured person into fresh air and keep person calm under observation. Get medical attention if any discomfort occurs.

Ingestion

Rinse mouth thoroughly if dust is ingested. Never give anything by mouth to an unconscious person. Only induce vomiting at the instruction of medical personnel. Get medical attention if any discomfort continues.

Notes to physician

Treat symptomatically.

General advice

First aid personnel must be aware of own risk during rescue.

5. Fire Fighting Measures**Extinguishing media****Suitable extinguishing media**

This material will not burn. Use fire-extinguishing media appropriate for surrounding materials.

Unsuitable extinguishing media

None.

Protection of firefighters**Specific hazards arising from the chemical**

None known.

Protective equipment and precautions for firefighters

Self-contained breathing apparatus and full protective clothing must be worn in case of fire. Selection of respiratory protection for fire fighting: follow the general fire precautions indicated in the workplace.

Specific methods

Use standard firefighting procedures and consider the hazards of other involved materials.

6. Accidental Release Measures**Personal precautions**

Ensure adequate ventilation. Avoid inhalation of dust and contact with skin and eyes. Wear suitable protective clothing. See Section 8 of the MSDS for Personal Protective Equipment.

Environmental precautions

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

Methods for cleaning up

Avoid dust formation. Collect dust using a vacuum cleaner equipped with HEPA filter.

7. Handling and Storage**Handling**

Provide adequate ventilation. Local exhaust is recommended. Avoid inhalation of dust and contact with skin and eyes. Wear suitable protective clothing. Use work methods which minimize dust production. Keep the workplace clean. Do not eat, drink or smoke when using the product.

Storage

Provide adequate ventilation. Store in tightly closed original container in a well-ventilated place.

8. Exposure Controls / Personal Protection**Occupational exposure limits****US. ACGIH Threshold Limit Values**

Components	Type	Value	Form
Aluminum oxide (Al ₂ O ₃) (1344-28-1)	TWA	1 mg/m ³	Respirable fraction.
Titanium dioxide (TiO ₂) (13463-67-7)	TWA	10 mg/m ³	

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value	Form
Aluminum oxide (Al ₂ O ₃) (1344-28-1)	PEL	15 mg/m ³	Total dust.
Silicon oxide (SiO ₂) (7631-86-9)	TWA	5 mg/m ³ 0.8 mg/m ³	Respirable fraction.
Titanium dioxide (TiO ₂) (13463-67-7)	PEL	20 mppcf 15 mg/m ³	Total dust.

Engineering controls

Provide adequate ventilation. Observe Occupational Exposure Limits and minimize the risk of inhalation of dust. Provide easy access to water supply and eye wash facilities.

Personal protective equipment**Eye / face protection**

Use tight fitting goggles if dust is generated.

Skin protection

Wear suitable protective clothing. Wear protective gloves.

Respiratory protection

Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits.

General hygiene considerations

Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical & Chemical Properties

Appearance	Grains. Powder.
Color	Brown.
Odor	Odorless.
Odor threshold	Not available.
Physical state	Solid.
Form	Grains. Powder.
pH	Not available.
Melting point	3727.4 °F (2053 °C)
Freezing point	Not available.
Boiling point	5432 °F (3000 °C)
Flash point	Not available.
Evaporation rate	Not available.
Flammability limits in air, upper, % by volume	Not available.
Flammability limits in air, lower, % by volume	Not available.
Vapor pressure	Not available.
Vapor density	Not available.
Specific gravity	3.9
Solubility (water)	Insoluble in water.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.

10. Chemical Stability & Reactivity Information

Chemical stability	Stable at normal conditions.
Conditions to avoid	Avoid dust formation.
Incompatible materials	Strong alkalis.
Hazardous decomposition products	None known.
Possibility of hazardous reactions	Will not occur.

11. Toxicological Information**Toxicological data****Components****Test Results**

Aluminum oxide (Al ₂ O ₃) (1344-28-1)	Acute Oral LD50 Rat: > 5000 mg/kg
Titanium dioxide (TiO ₂) (13463-67-7)	Acute Dermal LD Rabbit: > 10000 mg/kg Acute Inhalation LC Rat: > 6.82 mg/l 4 hours Acute Oral LD50 Rat: > 10000 mg/kg Acute Dermal LD50 Rabbit: > 2000 mg/kg
Silicon oxide (SiO ₂) (7631-86-9)	Acute Inhalation LC50 Rat: > 2.2 mg/l 1 hours Acute Inhalation LC50 Rat: > 2.08 mg/l 4 hours Acute Oral LD50 Rat: > 5000 mg/kg Acute Oral LD50 Rat: > 3300 mg/kg

Acute effects May cause discomfort if swallowed.

Local effects Causes eye and respiratory tract irritation.

Chronic effects Frequent inhalation of dust over a long period of time increases the risk of developing lung diseases.

Carcinogenicity Possible cancer hazard - may cause cancer based on animal data.
Inhalation of airborne titanium dioxide dust may cause cancer.

ACGIH Carcinogens

Aluminum oxide (Al₂O₃) (CAS 1344-28-1) A4 Not classifiable as a human carcinogen.
Titanium dioxide (TiO₂) (CAS 13463-67-7) A4 Not classifiable as a human carcinogen.

IARC Monographs. Overall Evaluation of Carcinogenicity

Silicon oxide (SiO₂) (CAS 7631-86-9) 3 Not classifiable as to carcinogenicity to humans.
Titanium dioxide (TiO₂) (CAS 13463-67-7) 2B Possibly carcinogenic to humans.

Mutagenicity Ames test: Negative.

Reproductive effects No data available.

Symptoms and target organs Dust may irritate the eyes and the respiratory system.

12. Ecological Information

Ecotoxicological data

Components	Test Results
Aluminum oxide (Al ₂ O ₃) (1344-28-1)	NOEC Daphnia magna: > 100 mg/l 48 hours NOEC Green algae (Selenastrum capricornutum): > 100 mg/l 72 hours NOEC Salmo trutta: > 100 mg/l 96 hours
Titanium dioxide (TiO ₂) (13463-67-7)	EC100 Daphnia magna: 1000 mg/l 18 days EC50 Daphnia magna: > 1000 mg/l 48 hours LC0 Carp (Leuciscus idus melanotus): >= 1000 mg/l 48 hours
Silicon oxide (SiO ₂) (7631-86-9)	EC50 Daphnia magna: > 10000 mg/l 24 hours LC0 Zebrafish (Danio rerio): 10000 mg/l 96 hours LC50 Carp (Cyprinus carpio): 10000 mg/l 72 hours NOEC Algae: 60 mg/l 72 hours

Ecotoxicity The product contains a substance which may cause long-term adverse effects in the aquatic environment.

Persistence and degradability No data available.

Bioaccumulation / Accumulation No data available.

Mobility in environmental media The product is insoluble in water and will sediment in water systems.

Partition coefficient (n-octanol/water) Not available.

13. Disposal Considerations

Waste from residues / unused products Dispose of in accordance with local regulations. Avoid discharge into water courses or onto the ground. Disposal recommendations are based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

Contaminated packaging Since emptied containers retain product residue, follow label warnings even after container is emptied.

14. Transport Information

DOT

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

15. Regulatory Information

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

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: De minimis concentration

Aluminum oxide (Al₂O₃) (CAS 1344-28-1) 1.0 %

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: Listed substance

Aluminum oxide (Al₂O₃) (CAS 1344-28-1) Listed.

CERCLA (Superfund) reportable quantity (lbs)

None

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - Yes
Delayed Hazard - Yes
Fire Hazard - No
Pressure Hazard - No
Reactivity Hazard - No

Section 302 extremely hazardous substance No

Section 311 hazardous chemical Yes

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

State regulations This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

US - California Hazardous Substances (Director's): Listed substance

Aluminum oxide (Al₂O₃) (CAS 1344-28-1) Listed.
Silicon oxide (SiO₂) (CAS 7631-86-9) Listed.

US - Massachusetts RTK - Substance: Listed substance

Aluminum oxide (Al₂O₃) (CAS 1344-28-1) Listed.
Silicon oxide (SiO₂) (CAS 7631-86-9) Listed.
Titanium dioxide (TiO₂) (CAS 13463-67-7) Listed.

US - New Jersey Community RTK (EHS Survey): Reportable threshold

Aluminum oxide (Al₂O₃) (CAS 1344-28-1) 500 LBS

US - New Jersey RTK - Substances: Listed substance

Aluminum oxide (Al₂O₃) (CAS 1344-28-1) Listed.
Silicon oxide (SiO₂) (CAS 7631-86-9) Listed.
Titanium dioxide (TiO₂) (CAS 13463-67-7) Listed.

US - Pennsylvania RTK - Hazardous Substances: Listed substance

Aluminum oxide (Al₂O₃) (CAS 1344-28-1) Listed.
Silicon oxide (SiO₂) (CAS 7631-86-9) Listed.
Titanium dioxide (TiO₂) (CAS 13463-67-7) Listed.

16. Other Information

Recommended use

Industrial use.

Further information

HMIS® is a registered trade and service mark of the NPCA.

E - Safety Glasses, Gloves, Dust Respirator

HMIS® ratings

Health: 2*

Flammability: 0

Physical hazard: 0

Personal protection: E

NFPA ratings

Health: 2

Flammability: 0

Instability: 0

Disclaimer

The information in this MSDS was obtained from sources which we believe are reliable, but no warranty or representation as to its accuracy or completeness is hereby given. Users should consider the information herein only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal, the safety and health of employees and customers and the protection of the environment.