

[Alumina (aluminum oxide)] [SHOWA DENKO K.K.] [CE-3101] [24/4/2007] [1/6]



SHOWA DENKO K.K.
 13-9, Shiba Daimon 1-Chome
 Minato-Ku, Tokyo 105-8518, Japan

Date of preparation : April 14, 1994
 Date of revision : April 24, 2007

MATERIAL SAFETY DATA SHEET

1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Alumina (aluminum oxide)
 Company name : SHOWA DENKO K.K.
 Address : 8, Ebisu-Cho, Kanagawa-Ku, Yokohama-Shi, Kanagawa, Japan
 Section : Marketing Department I, Ceramics Division, Inorganics Sector
 Phone number : +81-45-453-5110
 Facsimile number : +81-45-453-5645
 Emergency phone number : +81-45-453-5111 (Yokohama Plant, SHOWA DENKO K.K.)
 MSDS number : CE-3101

2. HAZARDS IDENTIFICATION

GHS classification
 Physical hazards : Flammable solid: Not applicable
 Pyrophoric solid: Not applicable
 Self-heating chemical: Not applicable
 Flammability hazard on contact with water: Not applicable
 Oxidizing solid: Not applicable
 Additionally, the material is not classified as a hazard under any category not listed above.
 Health hazards : Acute toxicity (oral): Not applicable
 Carcinogenicity: Not applicable
 STOST- single exposure: Class 3 (airway irritation)
 STOST- repeated exposure: Class 1 (lung; inhalation)
 Additionally, the material is not classified as a hazard under any category not listed above.
 Environmental hazards : Not classifiable.
 GHS label elements
 Pictograms (Symbols) : :
 Single words : Danger
 Hazard statements : Respiratory irritation may occur.
 Long-term or repeated exposure (inhalation) may lead to organ failure (lungs).
 Precautionary statements : (Preventive measures)
 Avoid eating or smoking before handling or working with the material.
 Wash hands thoroughly after handling the material.
 Use of the material should be restricted to outdoor locations and well-ventilated areas.
 If dust is or may be generated, wear a dust respirator, protective gloves, protective eyewear, and protective clothing.

[Alumina (aluminum oxide)] [SHOWA DENKO K.K.] [CE-3101] [24/4/2007] [2/6]

Use a vacuum cleaner to remove dust.

(First Aid)

In the event of nausea, seek medical attention. If the material is inhaled, move the victim to a location where fresh air is available and allow him/her to rest in a comfortable position.

(Storage)

If possible, store the material under lock and key.

Tightly close containers and store in well-ventilated indoor locations protected from water exposure.

(Disposal)

Dispose of contents and containers as specified under federal or local ordinances.

Main symptoms : No information
Emergency overview : No information

3. COMPOSITION/INFORMATION ON INGREDIENTS

Single substance or mixture : Single substance
Common chemical name : Aluminum oxide
(generic name)
Synonym(s) : Alumina
Chemical formula : Al_2O_3
CAS number : 1344-28-1
Content : Minimum 98% (by weight)
Publication number in Japanese official gazette : (1)-23
Impurities and stabilizing additives contributing to GHS classification
Common chemical name : No information
(generic name)
Content : No information

4. FIRST-AID MEASURES

Inhalation : Immediately move the victim to a location with fresh air and allow him/her to rest in a comfortable position. In the event of nausea, contact a physician.
Skin contact : Immediately flush skin with plenty of tap water.
Eye contact : Immediately flush eyes with plenty of clean water. Seek medical attention if eye irritation persists.
Ingestion : Administer plenty of water to induce vomiting. Seek medical attention, if necessary.
Brief description of the most important symptoms : No information
Protection of first-aiders : Wear protective clothing and protective equipment.
Special notes to a physician : Wear protective clothing and protective equipment.

5. FIRE-FIGHTING MEASURES

Extinguishing media : The material is not flammable of itself. Use fire-extinguishing media suitable for the surroundings.
Inappropriate extinguishing media : No information
Specific hazards with regard to fire-fighting measures : No information
Specific methods of fire-fighting and special equipment : No information
Protection of firefighters : Wear appropriate protective equipment (e.g., gloves, goggles, and/or mask) when fighting fires.

[Alumina (aluminum oxide)] [SHOWA DENKO K.K.] [CE-3101] [24/4/2007] [3/6]

6. ACCIDENTAL RELEASE MEASURES

- Personal precautions, protective equipment and emergency procedures : If dust is or may be generated, wear a dust respirator. Wear rubber gloves, protective goggles, and protective clothing when cleaning up spills.
- Environmental precautions : Dispose of collected spills as industrial waste.
- Methods for cleaning up : Use a vacuum cleaner to avoid generating dust.
- Prevention of secondary hazards : Avoid generating or scattering dust.

7. HANDLING AND STORAGE

Handling

- Technical measures : Implement the engineering measures described in "8. EXPOSURE CONTROLS/PERSONAL PROTECTION." Wear appropriate protective equipment.
- Local exhaust ventilation/general ventilation : Install the local/general ventilation facilities described in "8. EXPOSURE CONTROLS/PERSONAL PROTECTION".
- Precautions : If dust is or may be generated, wear a dust respirator.
- Safe handling advice : Use of the material should be restricted to outdoor locations and well-ventilated areas. Avoid contact, inhalation, and ingestion. Avoid inhaling dust or fumes. Wash hands thoroughly after handling the material.

Storage

- Appropriate storage conditions : If possible, store the material under lock and key. Tightly close containers and store in well-ventilated indoor locations protected from water exposure.
- Safe packaging materials : No information

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering measures to reduce exposure

- : Provide ventilation to keep atmospheric concentrations below the exposure limit.
Provide eye bath and safety shower station in areas where the material is stored or handled.

Administrative control level : 3.0 mg/m³

Exposure guidelines

Japan Society for Occupational Health (2005)

- : Inhalable dust 0.5 mg/m³ (Class 1 dust)
Total dust 2 mg/m³ (Class 1 dust)

ACGIH (2006)

- : TLV-TWA (time-weighted average) Al₂O₃ 10 mg/m³

Personal protective equipment

- Respiratory protection : Wear dust mask.
- Hand protection : Wear protective gloves.
- Eye protection : Wear protective goggles.
- Skin and body protection : Wear protective clothing.
- Specific hygiene measures : Avoid eating or smoking before handling or working with the material.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state

- Appearance : Powder
- Color : White
- Odor (odor threshold) : Odorless
- pH : Not applicable
- Boiling point : 3,000°C
- Initial boiling point and boiling range : No data
- Melting point/freezing point : 2,053°C

[Alumina (aluminum oxide)] [SHOWA DENKO K.K.] [CE-3101] [24/4/2007] [4/6]

Decomposition temperature	: No data
Flash point	: No data
Auto-ignition temperature	: No data
Flammability (solid, gas)	: No data
Upper/lower flammability or explosion limits	: No data
Vapor pressure	: No data
Vapor density	: No data
Evaporation rate	: No data
Relative density	: 3.98
Solubility	
Water	: Insoluble
Other solvents	: Insoluble
n-octanol/water partition coefficient	: No data

10. STABILITY AND REACTIVITY

Stability	: Stable in air.
Possibility of hazardous reactions	: Slightly soluble in acids and alkalis.
Conditions to avoid	: No information
Incompatible materials	: No information
Hazardous decomposition products	: No information

11. TOXICOLOGICAL INFORMATION

Acute toxicity	: Oral, rat, LD50 > 5,000 mg/kg 2)
Skin corrosion/irritation	: No information
Serious eye damage/irritation	: No information
Respiratory or skin sensitization	: No information
Mutagenicity (Germ cell mutagenicity)	: Negative in Ames test. No mutagenicity in Salmonella typhimurium TA100, TA1537, and TA1538 in metabolically active or inactive systems. 12)
Carcinogenicity	: According to ACGIH, comprehensive evaluation of human cancer risk is A4. Transplantation of fine-grained or fibrous aluminum oxide into rat pleurae resulted in tumor development. 5,6) No carcinogenicity was observed in a test based on NTP (National Toxicology Program). 7)
Reproductive toxicity	: No data
Specific target organ systemic toxicity -single exposure	: Inhalation of concentrated dust caused irritation of eyes and upper airway. 10)
Specific target organ systemic toxicity -repeated exposure	: According to one report, occupational exposure to aluminum oxide caused lung fibrosis, but detailed information is not available. 11) Inhalation, mouse, LC ₅₀ 357 mg/m ³ , intermittent administration for 60 days 5) Aluminum oxide inhaled by rats was retained in the lungs. Aluminum oxide deposits in rat lungs caused growth of microphages in alveolar spaces, leading to lipid pneumonia. Continued exposure caused local hyaline deposits on the walls of the alveoli. 4)
Aspiration hazard	: No information
Others	: No clinical presentation of pneumoconiosis was found in workers exposed to aluminum oxide during aluminum production or at a ceramic plant. 1,8,9)

[Alumina (aluminum oxide)] [SHOWA DENKO K.K.] [CE-3101] [24/4/2007] [5/6]

12. ECOLOGICAL INFORMATION

Eco-toxicity

Fish toxicity	: No information
Persistence/degradability	: No information
Bioaccumulative potential	: No information
Mobility in soil	: No information

13. DISPOSAL CONSIDERATIONS

Dispose of the material as industrial waste.

Note: When disposing of the product outside Japan, conform to applied laws and regulations in that country or territory.

14. TRANSPORT INFORMATION

International regulations for transport

UN hazard class	: Not applicable
UN number	: Not applicable
UN Proper Shipping Name	: Not applicable
Packing group	: Not applicable
Marine pollutant	: Not applicable
Additional regulations for transport	: Not applicable

Specific precautionary transport measures and conditions

: To prevent dust generation, avoid damaging the package. The material readily absorbs water. Protect from exposure to rain.

Emergency Response	: Not applicable
Guidebook number	

Note: When transporting the product outside Japan, conform to applied laws and regulations in that country or territory.

15. REGULATORY INFORMATION

Laws and regulations applied in Japan:

Industrial Safety and Health Law: Article 57-2-1, reportable substance, Government Ordinance No. 189 Ordinance on Preventing Dust Hazards

Pneumoconiosis Law: Enforcement Regulation Article 2 Annex Table, Dust-generating processes (alumina, dust)

The material is not required to be reported as a hazardous material under the PRTR Law or Poisonous and Deleterious Substances Control Law.

Note: When using the product outside Japan, it must be handled in accordance with applied laws and regulations in that country or territory.

16. OTHER INFORMATION

Contents of PRTR Law chemicals : Not applicable

TSCA Inventory	: Listed
EINECS number	: 215-691-6

References	1) Sutherland, C, L, et al., An Inquiry into the Health Hazard of a Group Workers Exposed to Alumina Dust., J. Ind. Hyd. Toxicol., 19, 312-319 (1937)
	2) Martinswerk GmbH Bergheim (TUCLID (2000))
	3) Goto et al., Industrial Poisoning Handbook, 242, Ishiyaku Pub, Inc. (1977)

[Alumina (aluminum oxide)] [SHOWA DENKO K.K.] [CE-3101] [24/4/2007] [6/6]

- 4) Venugopal, B., et al., Metal Toxicity in Mammals, 2. New York: Plenum Press, (1978) (in HSDB, 1997)
- 5) Stanton, M. F. et al., J. Natl. Cancer Inst., 67: 965-975 (1981)
- 6) Wagner, J. C. et al., Br. J. Cancer, 28, 173-185 (1973)
- 7) Documentation of the Threshold Limit Values and Biological Exposure Indices, 6th ed., 1991, 48-49
- 8) Meiklejohn A, et al., The Effect of the Use of Calcined Alumina in China Biscuit Placing on the Health of the Workman; J. Ind. Hyd. Toxicol., 30, 160-165 (1948)
- 9) Meiklejohn A, et al., The Effect of the Use of Calcined Alumina in China Biscuit Placing on the Health of the Workman, Brit. J. Ind. Med. 14, 229-231 (1957)
- 10) ICSC 0351-ALUMINIUM OXIDE ICSC (2000).
7.2.2 Inhalation exposure (EHC (1999))
- 11) 8.2.1 Respiratory tract effect (EHC (1999))
- 12) IUCLID dataset Existing chemical substance ID: 1344-28-1 (IUCLID (2000))

For further information, please contact

(Marketing Department I), Ceramics Division, Inorganic Sector, SHOWA DENKO K.K.

Telephone number : +81-45-453-5110

Facsimile number : +81-45-453-5645

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.

This is a translation of original Material Safety Data Sheet prepared in Japanese.