SHOWA DENKO K.K.

GPS/JIPS Safety Summary

1. SUBSTANCE NAME

Alumina (aluminum oxide) (CAS No.: 1344-28-1)

2. GENERAL STATEMENT

Alumina is a white-colored, powdery crystalline formed through the calcination of aluminum hydroxide. Numerous crystalline forms of alumina are known of, but the most stable and widely used is alpha alumina. Alpha alumina has a high melting point, is thermally stable, has a hardness next to that of diamond, is high in electric insulation and resistance properties, and remains stable in the presence of acids and alkalis.

3. CHEMICAL IDENTITY

Item	Description
Chemical or generic name	Aluminum oxide
Product name	Alumina (aluminum oxide)
CAS No.	1344-28-1
Other Nos.	Japan: Chemical Substances Control Law ; (1)-23 EC No./EINECS No.: 215-691-6
Chemical formula	Al_2O_3
Sources/references	Sections 3 of the SDS issued by SHOWA DENKO K.K.

4. USES AND APPLICATIONS

Main uses	Our product has mainly been used with fire-proof materials, insulators, spark plugs, IC substrates and packages, drilling and polishing materials, and in ceramics for heat and chemical resistant products, etc.

5. PHYSICAL/CHEMICAL PROPERTIES

The substance is a white-colored odorless powder that hardly dissolves in water.

Appearance	Powder
Color	White
Odor	Odorless
Relative density	3.98
Boiling point	3,000 ºC
Melting point	2,053 ºC

Lower and upper Flammability limits	No reliable data available.
Auto-ignition temperature	No reliable data available.
Vapor pressure	No reliable data available.
Solubility in water	Non-soluble
Partition coefficient (n-octanol/water)	No reliable data available.
Sources/references	Section 9 of the SDS issued by SHOWA DENKO K.K.

6. HEALTH EFFECTS

Effect assessment	Results (GHS(Note 1) hazard classification)
Acute toxicity (oral)	Not classified (Note 2)
Acute toxicity (dermal)	Classification not possible (Note 3)
Acute toxicity (inhalation; gases)	Not applicable (Note 4)
Acute toxicity (inhalation; vapor)	Classification not possible
Acute toxicity (inhalation; dust/mist)	Classification not possible
Skin corrosion/irritation	Not classified
Serious eye damage/eye irritation	Not classified
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
Specific target organ toxicity (single exposure)	Category 3 (inhalation:lung)
Specific target organ toxicity (repeated exposure)	Category 1 (respiratory tract irritation)
Aspiration hazard	Classification not possible
Sources/references	Sections 11 of the SDS issued by SHOWA DENKO K. K.

(Note 1) GHS (Globally Harmonized System of Classification and Labeling of Chemicals): It is a system for classifying chemicals according to type and hazard level, and for indicating label information pursuant to the globally unified rules for offering Safety Data Sheets.
(Note 2) Not classified: when the hazards are believed to be less than even the lowest hazard classification defined in the GHS.
(Note 3) Classification not possible: when unable to classify due to a lack of sufficiently reliable data for defining the classification.
(Note 4) Not applicable: when chemicals do not fall within the scope of classification because the physical properties defined in the GHS do not apply.

7. ENVIRONMENTAL EFFECTS

Effect assessment	Results (GHS hazard classification)
Hazardous to the aquatic environment	
Acute hazard	Not classified
Long-term hazard	Classification not possible
Sources/references	Sections 12 of the SDS issued by SHOWA DENKO K.K.

Environmental fate/dynamics	Results
Mobility in soil	No reliable data available.
Persistence/degradability	No reliable data available.
Bioaccumulation potential	No reliable data available.
Conclusion about PBT/vPvB	The criteria for persistent bioaccumulative and toxic (PBT; remaining persistently in the environment and possessing high bioaccumulation potential and toxicity) and very persistent and very bioaccumulative (vPvB; remaining very persistently in the environment and possessing very high bioaccumulation potential) chemicals are believed to inapplicable.
Sources/references	Section 12 of the SDS issued by SHOWA DENKO K.K. and Section 8 of the Chemical Safety Report of REACH

8. EXPOSURE

	Exposure potentials through main uses
Occupational exposures	When handling powders of the substance under normal temperatures, workers could be exposed through oral ingestion, contact with the skin, or inhalation if dust is generated during mixing/blending, measuring, packing, unpacking and other processes involving the substance. Harmful effects have been recognized mainly when the substance's high-density dust was inhaled. This may cause coughing and shortness of breath. Additionally, the substance could cause irritation in direct contact with the respiratory tracts, eyes and skin. However, the harmful effects resulting from oral intake of the substance are believed to be minor.
Consumer exposures	The substance is used as a source material for heat and chemical resistant ceramics and other products, so there is the potential that consumers could be exposed through dermal of inhalation. Harmful effects have been recognized mainly when its high-density dusts were inhaled, and this could cause coughing and shortness of breath. The substance could also irritate respiratory tracts, as well as the eyes and skin upon direct contact. The harmful effects resulting from oral ingestion are believed to be minor.
Environmental exposures	Although environmental exposure is possible in the following cases, no specific effects on the environment have been reported, as mentioned in Section 7 Environmental Effects.
Precautions	If there is the potential for exposure during use in other applications, please implement appropriate measures by referring to the risk management recommendations.

9. RISK MANAGEMENT RECOMMENDATIONS

	Risk management recommendations
Occupational exposures	Technical measures
	Carry out exhaust ventilation in order to keep a concentration of the substance in the air below the exposure limit value. Install eyewash fountains and safety showers at manufacturing places where the product is stored or handled.
	Local exhaust and total ventilation
	For controlling and restricting environmental concentrations below the following recommended values, install local exhaust or total ventilation systems at places where the product is manufactured or handled.
	Allowable exposure limit
	With regard to the product, the Japan Society for Occupational Health published (in 2011) the recommendation values as occupational exposure limits of 0.5 mg/m^3 for respirable dust (class 1 dusts) and 2 mg/m^3 for total dust (class 1 dusts), while the American Conference of Governmental Industrial Hygienists (ACGIH) published the threshold limit value of 1 mg/m^3 (time-weighted average; TLV-TWA). Implement management and control measures to keep its dust concentration below these values.
	Protective equipment
	While working, wear appropriate protective eyewears, dust-proof masks, air-supplied respirators, clothes and protective gloves made of materials impermeable to powders.
	Precautions
	Managers are asked to provide workers training concerning the selection and use of appropriate protective equipment, worksite management, etc. Recover the substance promptly to prevent the floor slippery when it leaks on the floor and others.
Consumer exposures	If dusts have been generated, take a precaution not to inhale its dusts and not to directly contact with its dusts on the human body. If the exposure amount is large, implement risk management measures similar to those indicated in “Occupational Exposures” above.
Environmental exposures	In order to prevent environmental exposures, implement preventive measures against leakage into rivers, water channels, and sewerage trenches, and pay attention to the daily management and handling of the substance.
Sources/references	Section 4,5,6,7,8,13 and 14 of the SDS issued by SHOWA DENKO K.K.

10. STATE AGENCY REVIEW

Hazard assessment	Situations of review
International Chemical Safety Cards	ICSC No. :0351, http://www.ilo.org/dyn/icsc/showcard.display?p_lang=en&p_card_id=0351

REACH	http://apps.echa.europa.eu/registered/data/dossiers/DISS-9eb4460f-9f3a-575c-e044-00144f67d031/DISS-9eb4460f-9f3a-575c-e044-00144f67d031_DISS-9eb4460f-9f3a-575c-e044-00144f67d031.html

11. REGULATORY INFORMATION/GHS CLASSIFICATION-LABELING INFORMATION

Regulatory information only in Japan

Applicable laws	Regulatory situations
Industrial Safety and Health Act	Material to be notified, Article 57-2 of the Act
Water Pollution Control Act	・Specified substance, paragraph 4, Article 2 of the Act, Article 3-3 of the Enforcement Ordinance
Pneumoconiosis Act	Article 2 of the Enforcement Ordinance, Appended Table (Dusty work), (alumina, powder)
Water supply Act	・Specified hazardous substance, paragraph 2, Article 4 of the Act, Water quality standard (Heisei 15 Article 101 of the Ordinance)
Foreign Exchange and Foreign Trade Act	Item (2), Appended Table 1-16 of Export Trade Control Order
UN classification	Not applicable
UN No.	Not applicable

GHS classification, label information

Hazards	Classification results (hazard information)
Physical chemical hazards	
Flammable solids	Not classified
Pyrophoric solids	Not classified
Self-heating substances and mixtures	Not classified
Substances and mixtures which, in contact with water, emit flammable gases	Not classified
Oxidizing solids	Not classified
Health hazards	
Acute toxicity (oral)	Not classified
Skin corrosion/irritation	Not classified
Serious eye damage/eye irritation	Not classified
Specific target organ toxicity (single exposure)	Category 3 (inhalation:lung)
Specific target organ toxicity (repeated exposure)	Category 1 (respiratory tract irritation)
Hazardous to the aquatic environment	
Acute hazard	Not classified
GHS label elements	
Pictogram or symbol	
Signal word	Danger

Hazard statement	May cause respiratory irritation Causes damage to lung through prolonged or repeated exposure(inhalation)

12. CONTACT INFORMATION

Company name	SHOWA DENKO K.K.
Address	8, Ebisu-cho, Kanagawa-ku, Yokohama, KANAGAWA 221-8517, Japan
Department	Ceramics Division , Marketing Department I
Telephone, fax	+81-45-453-5110/+81-45-453-5004

13. DATE OF ISSUE AND REVISION, ADDITIONAL INFORMATION

Date of issue: November 28, 2013
Revisions:

Date of revision	Revised section	Revised item	Version

Special instructions: none

14. DISCLAIMER

This Safety Summary which is a translation of original Safety Summary prepared in Japanese, has been prepared as a part of the efforts by GPS/JIPS: Japan Initiative of Product Stewardship by the chemical industry. This Safety Summary is meant to provide an outline of information related to the safe handling of the subject substance rather than provide expert information regarding the risk assessment processes, the effect on human health or the environment, etc. Moreover it is not a replacement for the Safety Data Sheet (SDS), the Chemical Safety Report (CSR), or other risk assessment documents. To the greatest extent possible, the Safety Summary contains accurate statements based on laws, materials, information and other data available at the time of issue. However, it does not cover all such data. Additionally, it does not intend to provide a guarantee in any way.