Safety Data Sheet

according to 29 CFR 1910.1200(g)

Flyash, JIS Z8901 Class 5

Revision date: 06.04.2020 Page 1 of 9

1. Identification

Product identifier
Flyash, JIS Z8901 Class 5

Substance name: silicon dioxide (amorphous)
CAS No: 60676-86-0

Recommended use of the chemical and restrictions on use
Use of the substance/mixture
test dust

Details of the supplier of the safety data sheet
Company name: Powder Technology Inc.
Street: 1300 Grey Fox Road
Place: USA-55112 Arden Hills, MN
Telephone: +1 952 894 -8737
e-mail: sales@powdertechnologyinc.com
Internet: http://www.powdertechnologyinc.com

Emergency phone number: +1 952 894 -8737

2. Hazard(s) identification

Classification of the chemical
29 CFR Part 1910.1200
Skin corrosion/irritation: Skin Irrit. 2
Serious eye damage/eye irritation: Eye Dam. 1

Label elements
29 CFR Part 1910.1200

Signal word: Danger

Pictograms:

Hazard statements
Causes skin irritation
Causes serious eye damage

Precautionary statements
Wash hands thoroughly after handling.
Wear protective gloves/protective clothing/eye protection/face protection.
If on skin: Wash with plenty of water.
If skin irritation occurs: Get medical advice/attention.
Take off contaminated clothing and wash it before reuse.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.
Continue rinsing.
Immediately call a poison center/doctor.

Hazards not otherwise classified
No information available.

3. Composition/information on ingredients

Substances
Safety Data Sheet

according to 29 CFR 1910.1200(g)

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Revision date: 06.04.2020

Chemical characterization
Contains:
- silicon dioxide (amorphous) 40 - 60 %
  CAS No. 60676-86-0
- Aluminium oxide; Alumina 15 - 30 %
  CAS No. 1344-28-1
- Iron (III) oxide (hematite) 5 - 35 %
  CAS No. 1309-37-1
- Titanium (II) oxide 1 - 3 %
  CAS No. 12137-20-1

Hazardous components

<table>
<thead>
<tr>
<th>CAS No</th>
<th>Components</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1305-78-8</td>
<td>Calcium oxide</td>
<td>1 - 3 %</td>
</tr>
<tr>
<td>1310-58-3</td>
<td>Potassium hydroxide; caustic potash</td>
<td>1 - 3 %</td>
</tr>
<tr>
<td>7446-11-9</td>
<td>Sulfur trioxide</td>
<td>0 - 1 %</td>
</tr>
</tbody>
</table>

4. First-aid measures

Description of first aid measures

General information
In all cases of doubt, or when symptoms persist, seek medical advice.

After inhalation
Provide fresh air. In case of irregular breathing or respiratory arrest provide artificial respiration. If experiencing respiratory symptoms: Call a doctor.

After contact with skin
Wash with plenty of water. Take off immediately all contaminated clothing and wash it before reuse. In case of skin reactions, consult a physician.

After contact with eyes
Rinse immediately carefully and thoroughly with eye-bath or water. Remove contact lenses, if present and easy to do. Continue rinsing. In case of eye irritation consult an ophthalmologist.

After ingestion
Rinse mouth immediately and drink plenty of water. Never give anything by mouth to an unconscious person or a person with cramps. Call a physician immediately.

Most important symptoms and effects, both acute and delayed
No information available.

Indication of any immediate medical attention and special treatment needed
Treat symptomatically.

5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media
Co-ordinate fire-fighting measures to the fire surroundings.

Specific hazards arising from the chemical
Non-flammable.
In case of fire: Gases/vapours, irritant; Gases/vapours, toxic.
Special protective equipment and precautions for fire-fighters
Wear a self-contained breathing apparatus and chemical protective clothing. Full protection suit.

Additional information
Knock down dust with water spray jet. Suppress gases/vapours/mists with water spray jet. Collect contaminated fire extinguishing water separately. Do not allow entering drains or surface water.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures
Provide adequate ventilation. Avoid dust formation. Do not breathe dust. Avoid contact with skin, eyes and clothes. Use personal protection equipment. Remove persons to safety.

Environmental precautions
Do not allow to enter into surface water or drains.

Methods and material for containment and cleaning up
Take up mechanically. Treat the recovered material as prescribed in the section on waste disposal.

Reference to other sections
Safe handling: see section 7
Personal protection equipment: see section 8
Disposal: see section 13

7. Handling and storage

Precautions for safe handling
Advice on safe handling
Provide adequate ventilation. Avoid dust formation. Do not breathe dust. Wear personal protection equipment. Avoid contact with skin, eyes and clothes. Avoid: Generation/formation of dust

Advice on protection against fire and explosion
Usual measures for fire prevention.

Conditions for safe storage, including any incompatibilities
Requirements for storage rooms and vessels
Keep container tightly closed.

Hints on joint storage
Do not store together with: Acid, Aluminium, Ammonium salts.

Further information on storage conditions
Protect from moisture.

8. Exposure controls/personal protection

Control parameters
Exposure limits

<table>
<thead>
<tr>
<th>CAS No.</th>
<th>Substance</th>
<th>ppm</th>
<th>mg/m³</th>
<th>f/cc</th>
<th>Category</th>
<th>Origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>1305-78-8</td>
<td>Calcium oxide</td>
<td></td>
<td>5</td>
<td>2</td>
<td>TWA (8 h)</td>
<td>PEL</td>
</tr>
<tr>
<td>1309-37-1</td>
<td>Iron oxide (Fe2O3) (respirable fraction)</td>
<td></td>
<td>5</td>
<td>2</td>
<td>TWA (8 h)</td>
<td>ACGIH-2019</td>
</tr>
<tr>
<td>1309-37-1</td>
<td>Iron oxide dust and fume (as Fe)</td>
<td></td>
<td>5</td>
<td>2</td>
<td>TWA (8 h)</td>
<td>REL</td>
</tr>
<tr>
<td>1309-37-1</td>
<td>Iron oxide fume</td>
<td></td>
<td>-</td>
<td>-</td>
<td>TWA (8 h)</td>
<td>PEL</td>
</tr>
<tr>
<td>1310-58-3</td>
<td>Potassium hydroxide</td>
<td></td>
<td>-</td>
<td>-</td>
<td>TWA (8 h)</td>
<td>ACGIH-2019</td>
</tr>
<tr>
<td>60676-86-0</td>
<td>Silica, fused, respirable dust (Z-3)</td>
<td>(Z-3)</td>
<td>(Z-3)</td>
<td>2</td>
<td>Peak</td>
<td>ACGIH-2019</td>
</tr>
<tr>
<td>1344-28-1</td>
<td>alpha-Alumina Respirable fraction</td>
<td></td>
<td>5</td>
<td>2</td>
<td>TWA (8 h)</td>
<td>PEL</td>
</tr>
<tr>
<td>1344-28-1</td>
<td>alpha-Alumina Total dust</td>
<td></td>
<td>15</td>
<td></td>
<td>TWA (8 h)</td>
<td>PEL</td>
</tr>
</tbody>
</table>

Exposure controls

Appropriate engineering controls
Provide adequate ventilation as well as local exhaustion at critical locations.

Protective and hygiene measures
Do not breathe dust. Avoid dust formation. Draw up and observe skin protection programme. Wash hands and face before breaks and after work and take a shower if necessary. When using do not eat, drink, smoke, sniff. Avoid contact with skin, eyes and clothes.

Eye/face protection
Wear eye protection/face protection.
Suitable eye protection: Dust protection goggles.

Hand protection
Wear suitable gloves.

For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves.

Skin protection
Wear suitable protective clothing.

Respiratory protection
In case of inadequate ventilation wear respiratory protection. Respiratory protection necessary at:
Generation/formation of dust.
Suitable respiratory protective equipment: particulates filter device (DIN EN 143).

Environmental exposure controls
Avoid release to the environment.

9. Physical and chemical properties

Information on basic physical and chemical properties

- Physical state: solid
- Color: dark grey - brown
- Odor: odourless
- pH-Value: not determined

Changes in the physical state

- Melting point/freezing point: not determined
1000 °C

Initial boiling point and boiling range:

Flash point:

not applicable

Flammability

Solid:

not determined

Gas:

not applicable

Explosive properties

The product is not: Explosive.

Lower explosion limits:

not applicable

Upper explosion limits:

not applicable

Auto-ignition temperature

Solid:

not determined

Gas:

not determined

Decomposition temperature:

not determined

Oxidizing properties

Not oxidising.

Vapor pressure:

not determined

Density:

2.9 g/cm³

Water solubility:

Immiscible

Solubility in other solvents

not determined

Partition coefficient:

not determined

Viscosity / dynamic:

not applicable

Viscosity / kinematic:

not applicable

Vapor density:

not determined

Evaporation rate:

not determined

10. Stability and reactivity

Reactivity

No hazardous reaction when handled and stored according to provisions.

Chemical stability

Stability: Stable

The product is stable under storage at normal ambient temperatures.

Possibility of hazardous reactions

Hazardous reactions: Will not occur


Conditions to avoid

Humidity

Incompatible materials

Acid, Aluminium, Ammonium salts.
Hazardous decomposition products
In case of fire: Gases/vapours, irritant; Gases/vapours, toxic.

11. Toxicological information

Information on toxicological effects

Route(s) of Entry
Inhalation, dermal, oral, Eye contact.

Acute toxicity
Based on available data, the classification criteria are not met.

<table>
<thead>
<tr>
<th>CAS No</th>
<th>Components</th>
<th>Exposure route</th>
<th>Dose</th>
<th>Species</th>
<th>Source</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1310-58-3</td>
<td>potassium hydroxide; caustic potash</td>
<td>oral</td>
<td>ATE</td>
<td>500 mg/kg</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Irritation and corrosivity
Causes skin irritation
Causes serious eye damage

Sensitizing effects
Based on available data, the classification criteria are not met.

Carcinogenic/mutagenic/toxic effects for reproduction
Based on available data, the classification criteria are not met.

Specific target organ toxicity (STOT) - single exposure
Based on available data, the classification criteria are not met.

Specific target organ toxicity (STOT) - repeated exposure
Based on available data, the classification criteria are not met.

Carcinogenicity (OSHA): Not listed.
Carcinogenicity (IARC): Ferric oxide (CAS 1309-37-1) is listed in group 3.
Carcinogenicity (NTP): Not listed.

Aspiration hazard
Based on available data, the classification criteria are not met.

12. Ecological information

Ecotoxicity
The product is not: Ecotoxic.

Persistence and degradability
The methods for determining the biological degradability are not applicable to inorganic substances.

Bioaccumulative potential
The product has not been tested.

Mobility in soil
The product has not been tested.

Other adverse effects
No information available.

Further information
Avoid release to the environment.

13. Disposal considerations

Waste treatment methods
Disposal recommendations
Do not allow to enter into surface water or drains. Dispose of waste according to applicable legislation.

Contaminated packaging
Wash with plenty of water. Completely emptied packages can be recycled.

14. Transport information

US DOT 49 CFR 172.101

Proper shipping name: No dangerous good in sense of this transport regulation.

Marine transport (IMDG)

UN number: No dangerous good in sense of this transport regulation.
UN proper shipping name: No dangerous good in sense of this transport regulation.
Transport hazard class(es): No dangerous good in sense of this transport regulation.
Packing group: No dangerous good in sense of this transport regulation.

Air transport (ICAO-TI/IATA-DGR)

UN number: No dangerous good in sense of this transport regulation.
UN proper shipping name: No dangerous good in sense of this transport regulation.
Transport hazard class(es): No dangerous good in sense of this transport regulation.
Packing group: No dangerous good in sense of this transport regulation.

Environmental hazards

ENVIRONMENTALLY HAZARDOUS: no

Special precautions for user
No information available.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
not applicable

15. Regulatory information

U.S. Regulations

National Inventory TSCA
CAS No. 60676-86-0: Yes.
CAS No. 1344-28-1: Yes.
CAS No. 1309-37-1: Yes.
CAS No. 1305-78-8: Yes.
CAS No. 12137-20-1: Yes.
CAS No. 1310-58-3: Yes.
CAS No. 7446-11-9: Yes.

National regulatory information
SARA Section 302 Extremely hazardous substances:
Sulfur trioxide (7446-11-9): Reportable quantity = 100 lbs., Threshold planning quantity = 100 lbs.
SARA Section 304 CERCLA:
Potassium hydroxide (1310-58-3): Reportable quantity = 1,000 (454) lbs. (kg)
SARA Section 311/312 Hazards:
Calcium oxide (1305-78-8): Immediate (acute) health hazard
Potassium hydroxide (1310-58-3): Immediate (acute) health hazard
Sulfur trioxide (7446-11-9): Immediate (acute) health hazard
SARA Section 313 Toxic release inventory:
Aluminum oxide (fibrous forms) (1344-28-1): De minimis limit = 1.0 %, Reportable threshold = Standard
Clean Air Act Section 112(r):
Sulfur trioxide (7446-11-9): Threshold quantities = 10,000 lbs.
State Regulations

Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65, State of California)
This product can not expose you to chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

16. Other information

Hazardous Materials Information Label (HMIS)
Health: 2
Flammability: 0
Physical Hazard: 0

NFPA Hazard Ratings
Health: 2
Flammability: 0
Reactivity: 1
Unique Hazard:
Revision date: 06.04.2020
Revision No: 1,00

Abbreviations and acronyms
ACGIH: American Conference of Governmental Industrial Hygienists
CFR: Code of Federal Regulations
DOT: Department of Transportation
ICAO: International Civil Aviation Organization
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
IARC: International Agency for Research on Cancer
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
CAS: Chemical Abstracts Service
NFPA: National Fire Protection Association
NTP: National Toxicology Program
OSHA: Occupational Safety and Health Administration
PEL: permissible exposure limit
REL: recommended exposure limit
SARA: Superfund Amendments and Reauthorization Act
STEL: Short-term exposure limit
TSCA: Toxic Substances Control Act
TWA: time-weighted average
TI: Technical Instructions
DGR: Dangerous Goods Regulations
UN: United Nations
ATE: Acute toxicity estimate
LC50: Lethal concentration, 50%
LD50: Lethal dose, 50%
LL50: Lethal loading, 50%
EL50: Effect loading, 50%
EC50: Effective Concentration 50%
ErC50: Effective Concentration 50%, growth rate
NOEC: No Observed Effect Concentration
BCF: Bio-concentration factor
MARPOL: International Convention for the Prevention of Marine Pollution from Ships
IBC: Intermediate Bulk Container
VOC: Volatile Organic Compounds
Other data

The above information describes exclusively the safety requirements of the product and is based on our present-day knowledge. The information is intended to give you advice about the safe handling of the product named in this safety data sheet, for storage, processing, transport and disposal. The information cannot be transferred to other products. In the case of mixing the product with other products or in the case of processing, the information on this safety data sheet is not necessarily valid for the new made-up material.