

**1. Product and Company Identification**

**Material name** FUSED MULLITE ZIRCONIA  
**Revision date** 01-26-2012  
**Version #** 01  
**CAS #** Mixture  
**Product use** Ceramics and Refractory.  
**Synonym(s)** MUZR e MUZRS  
**Manufacturer/Supplier** ELFUSA GERAL DE ELETROFUSÃO LTDA  
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**2. Hazards Identification**

**Physical state** Solid.  
**Appearance** Beige and gray powder.  
**Emergency overview** Low hazard under normal conditions.  
**OSHA regulatory status** This product is not hazardous according to OSHA 29CFR 1910.1200.  
**Potential health effects**  
**Routes of exposure** Inhalation. Ingestion. Skin contact. Eye contact.  
**Eyes** Dust may irritate the eyes.  
**Skin** Dust may irritate skin.  
**Inhalation** Dust may irritate the respiratory system.  
**Ingestion** Ingestion may cause irritation and malaise.  
**Target organs** Eyes. Skin. Reproductive system.  
**Chronic effects** Prolonged and repeated overexposure to dust can lead to pneumoconiosis.  
**Signs and symptoms** Irritation of eyes and mucous membranes. Irritation of nose and throat.  
**Potential environmental effects** Ecological injuries are not known or expected under normal use.

**3. Composition / Information on Ingredients**

Components	CAS #	Percent
Aluminum silicate	1302-93-8	< 70.0
Zirconium dioxide	1314-23-4	< 41.0
Impurities: Fe <sub>2</sub> O <sub>3</sub> +Na <sub>2</sub> O+CaO+MgO+TiO <sub>2</sub>	N/A	≤ 2.0

**Composition comments** All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume. For more detailed chemical composition, refer to the certificate of analysis.

**4. First Aid Measures****First aid procedures**

**Eye contact** Flush eyes thoroughly with water for at least 15 minutes. Get medical attention if irritation develops or persists.

**Skin contact** Wash with soap and water. Get medical attention if irritation develops or persists.

**Inhalation** Move to fresh air. Get medical attention if any discomfort continues.

<b>Ingestion</b>	Immediately rinse mouth and drink plenty of water. Get medical attention if irritation develops and persists.
<b>Notes to physician</b>	Treat symptomatically.
<b>General advice</b>	Get medical attention if any discomfort develops.

## 5. Fire Fighting Measures

<b>Flammable properties</b>	The product is not flammable.
<b>Extinguishing media</b>	
<b>Suitable extinguishing media</b>	Use fire-extinguishing media appropriate for surrounding materials.
<b>Unsuitable extinguishing media</b>	No restrictions known.
<b>Protection of firefighters</b>	
<b>Specific hazards arising from the chemical</b>	None known.
<b>Protective equipment and precautions for firefighters</b>	Self-contained breathing apparatus, operated in positive pressure mode and full protective clothing must be worn in case of fire.
<b>Fire fighting equipment/instructions</b>	Move containers from fire area if you can do it without risk.

## 6. Accidental Release Measures

<b>Personal precautions</b>	Ensure adequate ventilation. Avoid inhalation of dust and contact with skin and eyes. Wear protective clothing as described in Section 8 of this safety data sheet.
<b>Environmental precautions</b>	Avoid release to the environment. Prevent further leakage or spillage if safe to do so.
<b>Methods for cleaning up</b>	Recover and recycle, if practical. Sweep up or vacuum up spillage and collect in suitable container for disposal. Do not vacuum clean unless vacuum cleaners are equipped with HEPA filter.

## 7. Handling and Storage

<b>Handling</b>	Provide adequate ventilation. Use work methods which minimize dust production. Avoid inhalation of dust and contact with skin and eyes. Wear appropriate personal protective equipment. Do not add wet alumina to electrolysis cells. Observe good industrial hygiene practices.
<b>Storage</b>	Store in a dry place.

## 8. Exposure Controls / Personal Protection

### Occupational exposure limits

#### US. ACGIH Threshold Limit Values

Material	Type	Value	Form
FUSED MULLITE ZIRCONIA (Mixture)	TWA	1 mg/m3	Respirable fraction.
Components	Type	Value	Form
Aluminum silicate (1302-93-8)	TWA	1 mg/m3	Respirable fraction.
Zirconium dioxide (1314-23-4)	STEL	10 mg/m3	
	TWA	5 mg/m3	

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

Material	Type	Value	Form
FUSED MULLITE ZIRCONIA (Mixture)	PEL	5 mg/m3	Respirable fraction.
		15 mg/m3	Total dust.
Components	Type	Value	
Zirconium dioxide (1314-23-4)	PEL	5 mg/m3	

#### Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2)

Material	Type	Value
FUSED MULLITE ZIRCONIA (Mixture)	TWA	10 mg/m3

**Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2)**

Components	Type	Value
Zirconium dioxide (1314-23-4)	STEL	10 mg/m <sup>3</sup>
	TWA	5 mg/m <sup>3</sup>

**Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)**

Material	Type	Value	Form
FUSED MULLITE ZIRCONIA (Mixture)	TWA	1 mg/m <sup>3</sup>	Respirable.

Components	Type	Value	Form
Aluminum silicate (1302-93-8)	TWA	1 mg/m <sup>3</sup>	Respirable.
Zirconium dioxide (1314-23-4)	STEL	10 mg/m <sup>3</sup>	
	TWA	5 mg/m <sup>3</sup>	

**Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents)**

Material	Type	Value	Form
FUSED MULLITE ZIRCONIA (Mixture)	TWA	1 mg/m <sup>3</sup>	Respirable fraction.

Components	Type	Value	Form
Aluminum silicate (1302-93-8)	TWA	1 mg/m <sup>3</sup>	Respirable fraction.
Zirconium dioxide (1314-23-4)	STEL	10 mg/m <sup>3</sup>	
	TWA	5 mg/m <sup>3</sup>	

**Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment)**

Material	Type	Value	Form
FUSED MULLITE ZIRCONIA (Mixture)	TWA	10 mg/m <sup>3</sup>	Total dust.

Components	Type	Value
Zirconium dioxide (1314-23-4)	STEL	10 mg/m <sup>3</sup>
	TWA	5 mg/m <sup>3</sup>

**Mexico. Occupational Exposure Limit Values**

Material	Type	Value
FUSED MULLITE ZIRCONIA (Mixture)	TWA	10 mg/m <sup>3</sup>

Components	Type	Value
Zirconium dioxide (1314-23-4)	STEL	10 mg/m <sup>3</sup>
	TWA	5 mg/m <sup>3</sup>

**Exposure guidelines**

No exposure standards allocated.

**Engineering controls**

Provide sufficient ventilation for operations causing dust formation. If engineering measures are not sufficient to maintain concentrations of dust particulates below the Occupational Exposure Limit (OEL), suitable respiratory protection must be worn.

**Personal protective equipment****Eye / face protection**

Wear goggles/face shield.

**Skin protection**

Wear suitable gloves. Suitable gloves can be recommended by the glove supplier. Wear suitable protective clothing.

**Respiratory protection**

Seek advice from local supervisor.

**General hygiene considerations**

Wash hands after handling. Routinely wash work clothing and protective equipment to remove contaminants. Handle in accordance with good industrial hygiene and safety practice. Follow up on any medical surveillance requirements.

**9. Physical & Chemical Properties****Appearance**

Beige and gray powder.

**Color**

Beige and gray.

**Odor**

Odorless.

<b>Odor threshold</b>	Not available.
<b>Physical state</b>	Solid.
<b>Form</b>	Powder.
<b>pH</b>	8
<b>Melting point</b>	Not available.
<b>Freezing point</b>	Not available.
<b>Boiling point</b>	Not available.
<b>Flash point</b>	Not available.
<b>Evaporation rate</b>	Not applicable.
<b>Flammability limits in air, upper, % by volume</b>	Not available.
<b>Flammability limits in air, lower, % by volume</b>	Not available.
<b>Vapor pressure</b>	Not applicable.
<b>Vapor density</b>	Not applicable.
<b>Specific gravity</b>	3.72 at 20 °C
<b>Solubility (water)</b>	Insoluble
<b>Partition coefficient (n-octanol/water)</b>	Not applicable.
<b>Auto-ignition temperature</b>	Not applicable.
<b>Decomposition temperature</b>	Not available.
<b>Viscosity</b>	Not applicable.
<b>Bulk density</b>	Not applicable.

## 10. Chemical Stability & Reactivity Information

<b>Chemical stability</b>	Stable at normal conditions.
<b>Conditions to avoid</b>	Moisture. Contact with incompatible materials.
<b>Incompatible materials</b>	None known.
<b>Hazardous decomposition products</b>	No hazardous decomposition products are known.
<b>Possibility of hazardous reactions</b>	Hazardous polymerization does not occur. Hazardous reactions do not occur.

## 11. Toxicological Information

### Toxicological data

<b>Product</b>	<b>Test Results</b>
FUSED MULLITE ZIRCONIA (Mixture)	Acute Oral LD50 Rat: > 5000 mg/kg
<b>Acute effects</b>	Dust may cause eye, skin and respiratory tract irritation.
<b>Local effects</b>	May cause irritation through mechanical abrasion.
<b>Sensitization</b>	No sensitizing effects known.
<b>Chronic effects</b>	Prolonged and repeated overexposure to dust can lead to pneumoconiosis.
<b>Carcinogenicity</b>	Test data conclusive but not sufficient for classification.
<b>ACGIH Carcinogens</b>	
Aluminum silicate (CAS 1302-93-8)	A4 Not classifiable as a human carcinogen.
Zirconium dioxide (CAS 1314-23-4)	A4 Not classifiable as a human carcinogen.
<b>Mutagenicity</b>	Test data conclusive but not sufficient for classification.
<b>Reproductive effects</b>	Test data conclusive but not sufficient for classification.
<b>Symptoms and target organs</b>	Irritation of eyes and mucous membranes. Irritation of nose and throat.
<b>Further information</b>	Prolonged and repeated overexposure to dust can lead to pneumoconiosis.

## 12. Ecological Information

### Ecotoxicological data

#### Product

#### Test Results

FUSED MULLITE ZIRCONIA (Mixture)

EC50 Daphnia magna: > 100 mg/l 48 hours

EC50 Green algae (Selenastrum capricornutum): > 100 mg/l 72 hours

LC50 Salmo trutta: > 100 mg/l 96 hours

#### Ecotoxicity

This product has no known eco-toxicological effects. The product is not expected to be hazardous to the environment.

#### Environmental effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

#### Aquatic toxicity

Not expected to be harmful to aquatic organisms.

#### Persistence and degradability

The product is not biodegradable.

#### Bioaccumulation / Accumulation

The product is not bioaccumulating.

#### Partition coefficient (n-octanol/water)

Not applicable.

#### Mobility in environmental media

The product is insoluble in water. Aluminum oxide is not mobile in the environment, unless it comes into contact with an aqueous environment with a pH below 5.5 or above 8.5.

## 13. Disposal Considerations

#### Disposal instructions

Dispose in accordance with all applicable regulations.

#### Waste from residues / unused products

Recover and recycle, if practical. Dispose of in accordance with local regulations.

#### Contaminated packaging

Offer rinsed packaging material to local recycling facilities. Dispose of in accordance with local regulations.

## 14. Transport Information

#### DOT

Not regulated as dangerous goods.

#### IATA

Not regulated as dangerous goods.

#### IMDG

Not regulated as dangerous goods.

#### TDG

Not regulated as dangerous goods.

## 15. Regulatory Information

#### US federal regulations

This product is not hazardous according to OSHA 29CFR 1910.1200. All components are on the U.S. EPA TSCA Inventory List.

#### TSCA Section 12(b) Export Notification(40 CFR 707, Subpt. D)

Not regulated.

#### CERCLA (Superfund) reportable quantity (lbs) (40 CFR 302.4)

None

#### Superfund Amendments and Reauthorization Act of 1986 (SARA)

##### Hazard categories

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

##### Section 302 extremely hazardous substance (40 CFR 355, Appendix A)

No

##### Section 311/312 (40 CFR 370)

No

**Drug Enforcement Administration (DEA) (21 CFR 1308.11-15)** Not controlled

**WHMIS status** Non-controlled

**Inventory status**

<b>Country(s) or region</b>	<b>Inventory name</b>	<b>On inventory (yes/no)*</b>
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)	No
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)	No
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	No
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	No
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**

Zirconium dioxide (CAS 1314-23-4) Listed.

**US - Massachusetts RTK - Substance: Listed substance**

Zirconium dioxide (CAS 1314-23-4) Listed.

**16. Other Information**

**Recommended restrictions** -

**HMIS® ratings** Health: 1  
Flammability: 0  
Physical hazard: 0

**NFPA ratings** Health: 1  
Flammability: 0  
Instability: 0

**Disclaimer** The information in the sheet was written based on the best knowledge and experience currently available.

**Issue date** 01-25-2012