GGBS (Ground Granulated Blastfurnace Slag)

1.1. Product identifier
GGBS (Ground Granulated Blastfurnace Slag)

Further trade names
This MSDS covers the following products:
GGBS Normal
GGBS Superfine

REACH Registration Number: 01-2119487456-25-
CAS No: 65996-69-2
EC No: 266-002-0

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture
Additives, additives and binders for concrete, mortar and chemistry products for building industries, soil stabilization and immobilization and other construction products.
PROC 2: Use in closed, continuous process with occasional controlled exposure, PROC 3: Use in closed batch process (synthesis or formulation), PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact), PROC 7: Industrial spraying, PROC 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities, PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing), PROC 10: Roller application or brushing, PROC 11: Non industrial spraying, PROC 13: Treatment of articles by dipping and pouring, PROC 19: Hand-mixing with intimate contact and only PPE available, PROC 24: High (mechanical) energy work-up of substances bound in materials and/or articles, PROC 26: Handling of solid inorganic substances at ambient temperature, ERC 5: Industrial use resulting in inclusion into or onto a matrix, ERC 10a: Wide dispersive outdoor use of long-life articles and materials with low release, ERC 11a: Wide dispersive indoor use of long-life articles and materials with low release

Uses advised against
Any uses not listed above.

1.3. Details of the supplier of the safety data sheet
Company name: Ecocem
Street: F1 East Point Office Park
Place: Dublin 3, Ireland
Telephone: +44 0 845 434 8191
e-mail: info@ecocem.ie
Contact person: www.ecocem.co.uk

1.4. Emergency telephone number: NHS – 111 (24 hour)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture
Regulation (EC) No. 1272/2008
This substance is not classified as hazardous in accordance with Regulation (EC) No. 1272/2008.

2.2. Label elements
Additional advice on labelling
Labelling according to Regulation (EC) No. 1272/2008 [CLP]: none
2.3. Other hazards
The product develops an alkaline pH value with moisture and can cause irritation.

SECTION 3: Composition/information on ingredients

3.1. Substances

Chemical characterization
Slag in solid form, which is formed from the molten substance by the action of a melting agent on the lode matter of iron-containing materials from a blast furnace. The rapid cooling during the granulation creates glassy Blast Furnace Granules.

Hazardous components

<table>
<thead>
<tr>
<th>CAS No</th>
<th>Chemical name</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Slags, ferrous metal, blast furnace</td>
<td>100 %</td>
</tr>
</tbody>
</table>

Full text of H and EUH statements: see section 16.

Further Information
Product does not contain any listed SVHC substances > 0.1 % according to Regulation (EC) No 1907/2006 Article 59 (REACH)

SECTION 4: First aid measures

4.1. Description of first aid measures

General information
In case of accident or unwellness, seek medical advice immediately (show directions for use or safety data sheet if possible).

After inhalation
In case of accident by inhalation: remove casualty to fresh air and keep at rest. In case of respiratory tract irritation, consult a physician.

After contact with skin
Gently wash with plenty of soap and water. In case of skin irritation, seek medical treatment.

After contact with eyes
Rinse cautiously with water for several minutes. In case of persistent symptoms, consult an ophthalmologist.

After ingestion
Rinse mouth thoroughly with water. Drink water in little sips (dilution effect). Do NOT induce vomiting. In all cases of doubt, or when symptoms persist, seek medical advice.

4.2. Most important symptoms and effects, both acute and delayed

Inhalation of dust/particles: Irritation to respiratory tract. Coughing.
In case of skin contact: mechanical irritation. May cause sensitisation especially in sensitive humans.
Eye contact: Damage can be caused through mechanical influence of the product (e.g. sticking).

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

SECTION 5: Firefighting measures

5.1. Extinguishing media
Suitable extinguishing media
Product is not flammable. Carbon Dioxide (CO2), Dry extinguishing powder, alcohol resistant foam, atomized water can be used.

Unsuitable extinguishing media
None. Co-ordinate fire-fighting measures to the fire surroundings.

5.2. Special hazards arising from the substance or mixture
GGBS is non-combustible and non-explosive. It will not facilitate or sustain the combustion of other materials.

5.3. Advice for firefighters
Wear a self-contained breathing apparatus and chemical protective clothing.

Additional information
Collect contaminated fire extinguishing water separately. Do not allow entering drains or surface water. Co-ordinate fire-fighting measures to the fire surroundings.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
Ventilate affected area. Avoid generation of dust. Do not breathe dust. Wear personal protection equipment (refer to section 8).

6.2. Environmental precautions
Leaks may be protected against wind drifts with a tarpaulin. Discharge into the environment must be avoided.

6.3. Methods and material for containment and cleaning up
Use approved industrial vacuum cleaner for removal. (High efficiency particulate air filter (HEPA filter).) If vacuuming is not possible, knock down dust with water spray jet. Take up mechanically. Prevent the risk of slipping. Treat the recovered material as prescribed in the section on waste disposal.

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

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Advice on safe handling
Wear personal protection equipment (refer to section 8). Do not breathe dust.

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

Further information on handling
Avoid generation of dust. General protection and hygiene measures: refer to chapter 8

7.2. Conditions for safe storage, including any incompatibilities
Requirements for storage rooms and vessels
Keep container tightly closed. Keep the packing dry and well sealed to prevent contamination and absorption of humidity.

Advice on storage compatibility
Do not store together with: Explosives, oxidizing solids, oxidizing liquids, radioactive substances, infectious substances, food and animal feeding stuff.

Further information on storage conditions
Recommended storage temperature: 20°C Protect against: moisture.

7.3. Specific end use(s)
refer to chapter 1.
SECTION 8: Exposure controls/personal protection

8.1. Control parameters

<table>
<thead>
<tr>
<th>Substance</th>
<th>CAS No</th>
<th>Environmental compartment</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slags, ferrous metal, blast furnace</td>
<td>65996-69-2</td>
<td>Freshwater</td>
<td>5000 mg/l</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Marine water</td>
<td>500 mg/l</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Micro-organisms in sewage treatment plants (STP)</td>
<td>10000 mg/l</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Soil</td>
<td>1000 mg/kg</td>
</tr>
</tbody>
</table>

8.2. Exposure controls

**Appropriate engineering controls**
Dust should be exhausted directly at the point of origin.

**Protective and hygiene measures**
Always close containers tightly after the removal of product. When using do not eat, drink, smoke. Wash hands before breaks and after work.

**Eye/face protection**
Dust protection goggles.

**Hand protection**
In case of prolonged or frequently repeated skin contact:
- Wear suitable gloves.
  - Suitable material:
    - FKM (fluororubber). - Thickness of glove material: 0.4 mm
    - Breakthrough time >= 8 h
    - Butyl rubber. - Thickness of glove material: 0.5 mm
    - Breakthrough time >= 8 h
    - CR (polychloroprenes, Chloroprene rubber). - Thickness of glove material: 0.5 mm
    - Breakthrough time >= 8 h
    - NBR (Nitrile rubber). - Thickness of glove material: 0.35 mm
    - Breakthrough time >= 8 h
    - PVC (Polyvinyl chloride). - Thickness of glove material: 0.5 mm
    - Breakthrough time >= 8 h
- The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.
- Before using check leak tightness / impermeability. In the case of wanting to use the gloves again, clean them before taking off and air them well.

**Skin protection**
Suitable protective clothing: Protective clothing.
Minimum standard for preventive measures while handling with working materials are specified in the TRGS 500.

**Respiratory protection**
With correct and proper use, and under normal conditions, breathing protection is not required.
Respiratory protection necessary at:
- Generation/formation of dust
## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Powder, solid</td>
</tr>
<tr>
<td>Colour</td>
<td>white - light grey</td>
</tr>
<tr>
<td>Odour</td>
<td>characteristic</td>
</tr>
</tbody>
</table>

**Test method**

- **pH-Value**: > 11,5 (in aqueous solution)

**Changes in the physical state**

- **Melting point**: Not Applicable
- **Initial boiling point and boiling range**: Not Applicable
- **Sublimation point**: Not Applicable
- **Softening point**: Not Applicable
- **Pour point**: Not Applicable
- **Flash point**: Not Applicable
- **Sustaining combustion**: Will not sustain combustion

**Explosive properties**

- **Lower explosion limits**: Not Applicable
- **Upper explosion limits**: Not Applicable
- **Ignition temperature**: Not Applicable

**Auto-ignition temperature**

- **Solid**: Not Applicable

**Decomposition temperature**: Not Applicable

**Oxidizing properties**

- **Vapour pressure**: Not Applicable
- **Density**: 2,85-2,95 g/cm³
- **Bulk density**: 0.90 – 1.2
- **Water solubility**: 0,10 - 0,15 g/L

**Solubility in other solvents**

- **not determined**

**Partition coefficient**: Not Applicable

**Viscosity / dynamic**: Not Applicable

**Viscosity / kinematic**: Not Applicable
Flow time: Not Applicable
Vapour density: Not Applicable

9.2. Other information
Solid content: Not Applicable

Granulometry:
GGBS Normal: 1 - 60 µm
GGBS Superfine: 0.1 - 40 µm

SECTION 10: Stability and reactivity

10.1. Reactivity
No information available.

10.2. Chemical stability
The product is chemically stable under recommended conditions of storage, use and temperature.

10.3. Possibility of hazardous reactions
The product develops hydrogen in an aqueous solution in contact with metals.

10.4. Conditions to avoid
Protect against: moisture.

10.5. Incompatible materials

10.6. Hazardous decomposition products
As in the case of all fire: Carbon monoxide. Carbon dioxide (CO2) can be released

SECTION 11: Toxicological information

11.1. Information on toxicological effects
Toxicokinetics, metabolism and distribution
No data available.

Acute toxicity
Based on available data, the classification criteria are not met.
No data available.

<table>
<thead>
<tr>
<th>CAS No</th>
<th>Chemical name</th>
<th>Exposure route</th>
<th>Dose</th>
<th>Species</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>65996-69-2</td>
<td>Slags, ferrous metal, blast furnace</td>
<td>oral</td>
<td>LD50</td>
<td>&gt;2000 mg/kg</td>
<td>Rat</td>
</tr>
<tr>
<td></td>
<td></td>
<td>dermal</td>
<td>LD50</td>
<td>&gt;4000 mg/kg</td>
<td>Rat</td>
</tr>
<tr>
<td></td>
<td></td>
<td>inhalative (4 h) aerosol</td>
<td>LC50</td>
<td>&gt;5,23 mg/l</td>
<td>Rat</td>
</tr>
</tbody>
</table>

Irritation and corrosivity
Based on available data, the classification criteria are not met.
No data available.

Sensitising effects
Based on available data, the classification criteria are not met.
Respiratory or skin sensitisation:
Method: OECD Guideline 406
Result / evaluation: no danger of sensitization.

Carcinogenic/mutagenic/toxic effects for reproduction
Based on available data, the classification criteria are not met.
In-vitro mutagenicity: negative. ; literature information ECHA Dossier
In-vivo mutagenicity: negative. ; literature information ECHA Dossier
No evidence for reproductive toxicity in experimental animals.
No evidence for: Carcinogenicity.

**STOT-single exposure**
Based on available data, the classification criteria are not met.
No data available.

**STOT-repeated exposure**
Based on available data, the classification criteria are not met.
Subchronic inhalation toxicity:
Method: OECD Guideline 412 (Repeated Dose Inhalation Toxicity: 28/14-Day)
Species: Rat. ; Exposure duration: 28 d
Result: NOAEC = 24.9 mg/m³; literature information: ECHA Dossier

**Aspiration hazard**
Based on available data, the classification criteria are not met.
No data available.

**Specific effects in experiment on an animal**
No data available.

### SECTION 12: Ecological information

#### 12.1. Toxicity
No data available.

<table>
<thead>
<tr>
<th>CAS No</th>
<th>Chemical name</th>
<th>Aquatic toxicity</th>
<th>Dose</th>
<th>[h]</th>
<th>[d]</th>
<th>Species</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>65996-69-2</td>
<td>Slags, ferrous metal, blast furnace</td>
<td>Acute fish toxicity</td>
<td>LC50</td>
<td>&gt;100000 mg/l</td>
<td>96 h</td>
<td>Leuciscus idus</td>
<td>ECHA Dossier</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Acute algae toxicity</td>
<td>ErC50</td>
<td>&gt;100000 mg/l</td>
<td>72 h</td>
<td>Desmodesmus subspicatus</td>
<td>ECHA Dossier</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Acute crustacea toxicity</td>
<td>EC50</td>
<td>&gt;100000 mg/l</td>
<td>48 h</td>
<td>Daphnia magna</td>
<td>ECHA Dossier</td>
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<tr>
<td></td>
<td></td>
<td>Crustacea toxicity</td>
<td>NOEC</td>
<td>&gt;= 1563 mg/l</td>
<td>21 d</td>
<td>Daphnia magna</td>
<td>ECHA Dossier</td>
</tr>
</tbody>
</table>

#### 12.2. Persistence and degradability
No data available.

#### 12.3. Bioaccumulative potential
No indication of bioaccumulation potential.

<table>
<thead>
<tr>
<th>CAS No</th>
<th>Chemical name</th>
<th>BCF</th>
<th>Species</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>65996-69-2</td>
<td>Slags, ferrous metal, blast furnace</td>
<td>10</td>
<td>algae</td>
<td>ECHA Dossier</td>
</tr>
</tbody>
</table>

#### 12.4. Mobility in soil
No data available.

#### 12.5. Results of PBT and vPvB assessment
This substance does not meet the PBT/vPvB criteria of REACH, annex XIII.

#### 12.6. Other adverse effects
No data available.

**Further information**
Do not allow to enter into surface water or drains.
SECTION 13: Disposal considerations

13.1. Waste treatment methods

Advice on disposal
Observe in addition any national regulations! Consult the local waste disposal expert about waste disposal.
Non-contaminated packages may be recycled.
According to EAKV, allocation of waste identity numbers/waste descriptions must be carried out in a specific way for every industry and process.
Control report for waste code/ waste marking according to EAKV:

Waste disposal number of waste from residues-unused products
100202 WASTES FROM THERMAL PROCESSES; wastes from the iron and steel industry; unprocessed slag

Waste disposal number of used product
100202 WASTES FROM THERMAL PROCESSES; wastes from the iron and steel industry; unprocessed slag

Waste disposal number of contaminated packaging
150106 WASTE PACKAGING; ABSORBENTS, WIPING CLOTHS, FILTER MATERIALS AND PROTECTIVE CLOTHING NOT OTHERWISE SPECIFIED; packaging (including separately collected municipal packaging waste); mixed packaging

Contaminated packaging
Handle contaminated packages in the same way as the substance itself.

SECTION 14: Transport information

Land transport (ADR/RID)
14.1. UN number: Not restricted
14.2. UN proper shipping name: Not restricted
14.3. Transport hazard class(es): Not restricted
14.4. Packing group: Not restricted

Inland waterways transport (ADN)
14.1. UN number: Not restricted
14.2. UN proper shipping name: Not restricted
14.3. Transport hazard class(es): Not restricted
14.4. Packing group: Not restricted

Marine transport (IMDG)
14.1. UN number: Not restricted
14.2. UN proper shipping name: Not restricted
14.3. Transport hazard class(es): Not restricted
14.4. Packing group: Not restricted

Air transport (ICAO-TI/IATA-DGR)
14.1. UN number: Not restricted
14.2. UN proper shipping name: Not restricted
14.3. Transport hazard class(es): Not restricted
14.4. Packing group: Not restricted

14.5. Environmental hazards
ENVIRONMENTALLY HAZARDOUS: no
14.6. Special precautions for user
refer to chapter 6-8

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code
not relevant

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

EU regulatory information
- 2010/75/EU (VOC): 0 % (estimated)
- 2004/42/EC (VOC): 0 g/L (estimated)
- Information according to 2012/18/EU (SEVESO III): Not subject to 2012/18/EU (SEVESO III)

Additional information
This substance is classified as not hazardous according to regulation (EC) No. 1272/2008 [CLP]. REACH 1907/2006 Appendix XVII: not relevant

National regulatory information
Water contaminating class (D): - - not water contaminating

15.2. Chemical safety assessment
For this substance a chemical safety assessment has been carried out.

SECTION 16: Other information

Changes
Rev. 1.0; Initial release 01.02.2016

Abbreviations and acronyms
- ADR: Accord européen sur le transport des marchandises dangereuses par Route
- CAS: Chemical Abstracts Service
- DNEL: Derived No Effect Level
- IARC: INTERNATIONAL AGENCY FOR RESEARCH ON CANCER
- IMDG: International Maritime Code for Dangerous Goods
- IATA: International Air Transport Association
- IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)
- ICAO: International Civil Aviation Organization
- ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO)
- GHS: Globally Harmonized System of Classification and Labelling of Chemicals
- GefStoffV: Gefahrstoffverordnung (Ordinance on Hazardous Substances, Germany)
- LOAEL: Lowest observed adverse effect level
- LOAEC: Lowest observed adverse effect concentration
- LC50: Lethal concentration, 50 percent
- LD50: Lethal dose, 50 percent
- NOAEL: No observed adverse effect level
- NOAEC: No observed adverse effect level
- NTP: National Toxicology Program
- N/A: not applicable
- OSHA: Concerning the International Transport of Dangerous Goods by Rail
- PNEC: predicted no effect concentration
- PBT: Persistent bioaccumulative toxic
- RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
- SARA: Superfund Amendments and Reauthorization Act
Further Information

Classification according EC regulation 1272/2008 (CLP):
- Classification procedure:
  - Health hazards: Calculation method.
  - Environmental hazards: Calculation method.
  - Physical hazards: On basis of test data, and/or calculated and/or estimated.

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.

Identified uses

<table>
<thead>
<tr>
<th>No</th>
<th>Short title</th>
<th>SU main</th>
<th>SU</th>
<th>PC</th>
<th>PROC</th>
<th>ERC</th>
<th>AC</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Additives, additives and binders for concrete, mortar and chemical products for building industries, soil stabilization and immobilization and other construction products.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2, 3, 5, 7, 8a, 8b, 9, 10, 11, 13, 19, 22, 26</td>
<td>5, 11a</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>