Flue Gas Desulphurisation gypsum

1. IDENTIFICATION OF THE SUBSTANCE AND OF THE COMPANY

1.1 Product identifier
Substance name: Calcium sulfate
Trade name: Flue Gas Desulphurisation gypsum
Composition: CaSO₄·2H₂O
EC No: 231-900-3
REACH No (general part): 01-2119-18-26-xxxx
N.B.: Full registration numbers of individual producers are available on request
CAS No: 7778-18-9

1.2 Relevant identified uses of the substance and uses advised against
Use of the substance:
Binding agents; Fertilisers; Fillers; Food/feedstuff additives; Intermediates; Laboratory chemicals, Pharmaceutical substance; pH-regulating agents; Process regulators, other than polymerisation or vulcanisation processes; Processing aid, not otherwise listed; Agents adsorbing and absorbing gases or liquids; Colouring agents, pigments; Complexing agents;

1.2.1 Relevant identified uses
The product is intended for industrial use.
The product is intended for professional use.
The product is intended for private use.
The product is intended for research, analysis and scientific education.

1.2.2 Uses advised against:
None.
1.3 Details of the supplier of the safety information sheet
Supplier: Vliegasunie B.V. (Distributor)

Information contact:
Vliegasunie B.V.
P.O. Box 265
4100 AG Culemborg
The Netherlands

Phone (only available during office hours): +31 (0) 345 50 99 88
Fax: +31 (0) 345 50 99 80
E-Mail (competent person): asaraber@vliegasunie.nl

1.4 Emergency Telephone Number
European Emergency Call: 112

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance

2.1.1 Classification according to Regulation (EC) No 1272/2008 [CLP]
This substance is not classified as hazardous according to Regulation (EC) No 1272/2008 [CLP].

2.2 Label elements
This substance does not need to be labelled according to Regulation (EC) No 1272/2008 [CLP].

2.3 Other hazards
No special remarkable hazards.

This substance does not comply with criteria for PBT or vPvB

Please observe the information given in this safety information sheet.

Adverse physicochemical effects:
No special remarkable hazards.

Adverse human health effects and symptoms:
No special remarkable hazards.

Adverse environmental effects:
No special remarkable hazards.

Other adverse effects:
Large quantities of dust may be produced during dry-state pulverization.
3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances

Substance name:
Calcium sulfate

EC Nr:
231-900-3

Composition:
CaSO$_4$·2H$_2$O

Purity:
≥ 95 % m/m; occasionally >90% m/m

Synonyms:
Flue Gas Desulphurisation Gypsum, FGD Gypsum, Rookgasontzwaveling(s)gips, RO-gips, ROI-gips, REA-gips, Rauchgas-Entschwefelungsgips

Stabilisers: None.
Hazard impurities: None
Additional information: None

4. FIRST AID MEASURES

4.1 Description of first aid measures

General notes
No adverse effects are expected during normal use of the substance, however if any effects do appear the following recommendations apply.

Following inhalation:
Following inhalation of large quantities of dust remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Following skin contact:
If some discomfort appears immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Following eye contact:
Immediately flush eyes with plenty of water, lifting lower and upper eyelids occasionally. Get medical attention immediately.

Following ingestion:
Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.

Notes for the doctor:
Skin – friendly neutral salt. No allergic reactions known. Soluble dust.

4.2 Most important symptoms and effects, both acute and delayed
No specific symptoms or effects have been reported.
4.3 Indication of any immediate medical attention and special treatment needed
Not applicable.

5. FIREFIGHTING MEASURES

5.1 Extinguishing media
Suitable extinguishing media:
Use any means suitable for extinguishing surrounding fire. The substance itself is not combustible.

Unsuitable extinguishing media:
None.

5.2 Special hazards arising from the substance
None.

5.3 Advice for fire-fighters
Product itself does not burn.
Co-ordinate fire-fighting measures to the fire surroundings.

Special protective equipment for fire-fighters:
None.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
For non-emergency personnel and for emergency personnel:
Ventilate area of leak or spill. Wear appropriate personal protective equipment.
Avoid generation of dust, especially airborne dust.
Special danger of slipping by leaking/spilling product.

6.2 Environmental precautions:
No special environmental measures are necessary.

6.3 Methods and material for containment and cleaning up
For containment:
All containment for dry substances suitable.

For cleaning up:
Vacuuming cleaning may be used. Avoid dust dispersal.

6.4 Reference to other categories
See also chapter 8 and 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Protective measures:
No special provisions if the product is used appropriately.

Avoid dust dispersion.
Avoid inhalation of dust/particles.
Avoid eye contact.
Avoid prolonged skin contact.

Measures to prevent fire
Product itself does not burn.
No special fire protection measures are necessary.

Measures to prevent aerosol and dust generation:
If technically possible use local exhaust ventilation.

Measures required to protect the environment:
No special provisions if the product is used appropriately.

Advice on general occupational hygiene:
Do not eat, drink and smoke in work areas.
Wash hands after use.
Remove contaminated clothing and protective equipment before entering eating areas.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures and storage conditions:
Packaging materials: Keep/store only in original container.

Requirements for storage rooms and vessels:
None.

Hints on storage assembly:
Storage class:
Non-combustible solids.

Further information on storage conditions:
Storage according to BREF "Emissions from Storage"
http://eippcb.jrc.es/reference/

7.3 Specific end use
Not applicable.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

8.1.1 Occupational exposure limits:

No public limit values for calcium sulfate applicable in The Netherlands
No public limit values for respirable/inhalable nuisance dust applicable in The Netherlands

See 8.1.4 for recommended exposure limits

8.1.2 Monitoring procedures
None

8.1.3 Biological limit values
8.1.4 Additional no-effect levels (DNEL, PNEC0 and recommended exposure limits)

<table>
<thead>
<tr>
<th>DNEL* (general population)</th>
<th>Exposure pattern</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>Acute systemic effects</td>
<td>11.4 mg/kg bw/day</td>
</tr>
<tr>
<td></td>
<td>Long term systemic</td>
<td>1.52 mg/kg bw/day</td>
</tr>
</tbody>
</table>

* Derived No Effect Level

<table>
<thead>
<tr>
<th>PNEC*</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquatic</td>
<td>Not acutely toxic to fish, invertebrates, algae and microorganisms at the concentrations tested in the studies. Acute toxicity of calcium sulfate to fish, invertebrates, algae and microorganisms are generally greater than the highest concentrations tested and are greater than the maximum solubility of calcium sulfate in water.</td>
</tr>
<tr>
<td>Sediment</td>
<td>Not applicable due to ubiquitous nature of calcium and sulfate ions in the environment</td>
</tr>
<tr>
<td>Soil</td>
<td>Not applicable due to ubiquitous nature of calcium and sulfate ions in the environment</td>
</tr>
<tr>
<td>Sewage Treatment Plant</td>
<td>Not toxic to STP microorganisms</td>
</tr>
</tbody>
</table>

* Predicted No Effect Concentration

<table>
<thead>
<tr>
<th>Recommended Exposure Limit Values (Workers) *</th>
<th>Remarks</th>
<th>Limit value 8-hours</th>
<th>Limit value Short term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation</td>
<td>Nuisance dust, respirable</td>
<td>5 mg/m³</td>
<td>10 mg/m³</td>
</tr>
<tr>
<td>Inhalation</td>
<td>Nuisance dust, inhalable</td>
<td>10 mg/m³</td>
<td>20 mg/m³</td>
</tr>
</tbody>
</table>

* Available from Threshold Limit Value list (Netherlands, 2007), withdrawn in 2008

8.2 Exposure controls

8.2.1 Appropriate engineering controls

<table>
<thead>
<tr>
<th>Closed cycles</th>
<th>Care for dedusting installations and chimney filters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semi-closed and open cycles</td>
<td>Care for sufficient local exhaust ventilation or wetting the gypsum</td>
</tr>
</tbody>
</table>

8.2.2 Individual protection measures
9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Physical state</th>
<th>Solid. Crystalline Powder Granulate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour:</td>
<td>White-grey, beige, light yellow</td>
</tr>
<tr>
<td>Odour:</td>
<td>Neutral</td>
</tr>
<tr>
<td>Smell threshold:</td>
<td>Not applicable</td>
</tr>
<tr>
<td>pH (20 °C):</td>
<td>in delivery state: not applicable</td>
</tr>
<tr>
<td></td>
<td>in aqueous solution: ca. 7</td>
</tr>
<tr>
<td>Melting point/freezing point:</td>
<td>1450°C</td>
</tr>
<tr>
<td>Boiling point:</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Flash point:</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Flammability:</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Upper/lower flammability or explosive limits:</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Vapour pressure:</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Density:</td>
<td>2.96 g/cm³</td>
</tr>
<tr>
<td>Bulk density:</td>
<td>1300-1500 kg/m³</td>
</tr>
<tr>
<td>Water solubility (20°C):</td>
<td>about 2 g/l</td>
</tr>
<tr>
<td>Part. coeff. n-Octanol/Water (log Po/w):</td>
<td>Not applicable (inorganic)</td>
</tr>
<tr>
<td>Auto ignition temperature:</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Decomposition Temperature (°C):</td>
<td>not applicable</td>
</tr>
<tr>
<td>into CaSO₄ · 0.5 H₂O and 1.5 H₂O</td>
<td>about 140°C (about 413 K)</td>
</tr>
<tr>
<td>into CaSO₄ and H₂O</td>
<td>about 700°C (about 973 K)</td>
</tr>
<tr>
<td>into CaO and SO₃</td>
<td>about 1000°C (about 1273 K)</td>
</tr>
<tr>
<td>Viscosity:</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Explosive properties:</td>
<td>Not explosive</td>
</tr>
<tr>
<td>Oxidizing properties:</td>
<td>Not oxidizing</td>
</tr>
</tbody>
</table>

9.2 Other information
None

10. STABILITY AND REACTIVITY

10.1 Reactivity
Materials to avoid: No materials known.

10.2 Chemical stability
The substance is stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

10.3 Possibility of hazardous reactions
Mixing with an aqueous solution of sodium carbonate will result in the formation of carbon dioxide.

10.4 **Conditions to avoid**
Avoid contamination by sulphur-reducing bacteria and water under anaerobic conditions.

10.5 **Incompatible materials**
No incompatible materials known.

10.6 **Hazardous decomposition products**
Decomposition takes place from temperatures above: 1450°C
Decomposition under formation of: Sulphur trioxide and calcium oxide

11. **TOXICOLOGICAL INFORMATION**

11.1 **Information on toxicological effects**

<table>
<thead>
<tr>
<th>Hazard class</th>
<th>Information</th>
<th>source</th>
<th>Test method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute toxicity</td>
<td>Not classified</td>
<td>REACh - CSR</td>
<td>See source</td>
</tr>
<tr>
<td>Skin corrosivity/ -irritation</td>
<td>Not classified</td>
<td>REACh - CSR</td>
<td>See source</td>
</tr>
<tr>
<td>Serious eye damage / eye irritation</td>
<td>Not classified</td>
<td>REACh - CSR</td>
<td>See source</td>
</tr>
<tr>
<td>Sensitisation of the bronchial tubes / skin</td>
<td>Not classified</td>
<td>REACh - CSR</td>
<td>See source</td>
</tr>
<tr>
<td>Mutagenicity in gametes</td>
<td>Not classified</td>
<td>REACh - CSR</td>
<td>See source</td>
</tr>
<tr>
<td>Carcinogenicity</td>
<td>Not classified</td>
<td>REACh - CSR</td>
<td>See source</td>
</tr>
<tr>
<td>Toxicity to reproduction</td>
<td>Not classified</td>
<td>REACh - CSR</td>
<td>See source</td>
</tr>
<tr>
<td>STOT single exposure</td>
<td>Not classified</td>
<td>REACh - CSR</td>
<td>See source</td>
</tr>
<tr>
<td>STOT repeated exposure</td>
<td>Not classified</td>
<td>REACh - CSR</td>
<td>See source</td>
</tr>
<tr>
<td>Breathing hazard</td>
<td>Not classified</td>
<td>REACh - CSR</td>
<td>See source</td>
</tr>
</tbody>
</table>

12. **ECOLOGICAL INFORMATION**

12.1 **Toxicity**
The substance is not classified as hazardous.
No aquatic toxicity.
No toxicity for sewage treatment plant microorganisms.

After neutralisation, toxicity is no longer observed.

The ecological data were measured on the hydrolysed product.

12.2 **Persistence and degradability**

Biodegradation is not expected.

Abiotic degradation (e.g. oxidation, hydrolysis, photolysis) is not expected.
The product hydrolyses quickly in the presence of water to: Calcium and Sulfate Ions. The individual components are poorly eliminated from water.

12.3 **Bioaccumulative potential**
Based on the substance properties there is no indication to bioaccumulation potential.

12.4 **Mobility in soil**
Water-soluble solid. 
Natural constituent in soils. 
If product enters soil, it will be mobile and may contaminate groundwater.

12.5 **Results of PBT and vPvB assessment**
This substance does not meet the criteria for classification as PBT or vPvB.

12.6 **Other adverse effects**
No other adverse effects on the environment are known.

13. **DISPOSAL CONSIDERATIONS**

13.1 **Waste treatment methods**

**Product:**
Waste disposal according to national regulations covering non-hazardous waste.

**Waste codes according to EWC:**
10 Wastes from thermal processes
10 01 Wastes from power stations and other combustion plants (except 19)
10 01 05 Calcium-based reaction wastes from flue-gas desulphurisation in solid form

The waste is to be kept separate from other types of waste until its recycling.

Non-contaminated packages may be recycled.

**Additional information:**
Product: product can be further used without restrictions if not subsequently contaminated. 
Waste: Recovery/recycling in installations with permit for the waste codes given above. 
Waste disposal on disposal classes for non-inert waste according to 2003/33/EC.

14. **TRANSPORT INFORMATION**

Transport according to national, European (EU) and international (OECD, ADR, IMDG, IATA) regulations for non-hazardous substances.

14.1 **UN-number**
Not applicable

14.2 **Proper shipping name according to the model regulations of the UN**
Non applicable

14.3 **Transport hazard class**
14.4 Packing Group
Non applicable

14.5 Hazards for the environment
Non applicable

14.6 Special precautions for the user
Non applicable

14.7 Transport in bulk according to annex II of Marpol and the IBC-code
Non applicable

15. REGULATORY INFORMATION

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

EU regulations:
This substance is not classified as hazardous according to Regulation (EC) No 1272/2008 [CLP]

15.2 Chemical Safety Assessment:
For this substance a Chemical Safety Assessment has been carried out

16. OTHER INFORMATION

16.1 Changes in this version
Version 2: adaption according to the requirements of Regulation (EU)2015/830 28 mei 2015.

16.2 List of abbreviations
CLP = Classification, Labeling and Packaging
PBT = Persistent, Bio-accumulative, Toxic
vPvB = very Persistent, very Bioaccumulative
UVCB = Substance of unknown or variable composition, complex reaction products of biological materials

16.3 Reference sources en data sources
Chemical Safety Report – REACH dossier, Harlan Laboratories

16.4 Reference sources en data sources
Training instructions
Training instructions on health and safety issues are available on www.eurogypsum.org
- Manual handling of loads -
16.5 Disclaimer
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 information 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 information sheet is not necessarily valid for the new made-up material.

Calcium sulfate is not hazardous and therefore a safety data sheet (SDS) is legally not obligatory. This safety information sheet (SIS) was composed on a voluntary basis. The information given follows by structure and content Annex 2 of REACH-regulation (EC No 1907/2006 and amendment 453/2010) regarding the preparation of a SDS.