

Safety Data Sheet

SECTION 1: Identification of the substance and of the company/undertaking

Date of first issue: 31-May-2011
Version number: 03
Revision date 25-October-2013
Supersedes date: 25-October-2013
1.1. Product identifier
Name of the substance: Slags, ferrous metal, blast furnace
Brand name: **Granulated blast furnace slag (GBS)**
CAS: 65996-69-2
EINECS: 266-002-0
Reach status: UVCB (Unknown or variable composition complex reaction product of biological origin)
Company: **ArcelorMittal S.A**
 19, avenue de la Liberté
 L – 2930 Luxembourg
Website: www.arcelormittal.com

Legal Entities	REACH Registration Numbers
ArcelorMittal Belgium – Gent Site	01-2119487456-25-0015
ArcelorMittal Atlantique et Lorraine – Dunkirk and Florange Sites	01-2119487456-25-0022
ArcelorMittal Bremen GmbH	01-2119487456-25-0018
ArcelorMittal Eisenhüttenstadt GmbH	01-2119487456-25-0017
ArcelorMittal Espana S.A.	01-2119487456-25-0019
ArcelorMittal Galati SA	01-2119487456-25-0016
ArcelorMittal Liège Upstream ¹	01-2119487456-25-0012
ArcelorMittal Méditerranée – Fos Sur Mer Site	01-2119487456-25-0020
ArcelorMittal Poland S.A.	01-2119487456-25-0014
ArcelorMittal Ostrava a.s.	01-2119487456-25-0013
ArcelorMittal Zenica	01-2119487456-25-0009
OJSC ArcelorMittal Kryviy Rih	01-2119487456-25-0008

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

Identified uses

Cement or clinker production; road construction; earth works; as gravel for roads, places, railway; hydraulic engineering; constituent/additive for cement, concrete and other hydraulic binders; wastewater treatment/water treatment; fertilizer and soil conditioner; stone-wool and building material production. See section 16 for the list of PROC codes.

Uses advised against

None known.

1.3. Details of the supplier of the safety data sheet

Department supplying safety information: ArcelorMittal Health & Safety – Product Safety
 19, avenue de la Liberté
 L – 2930 Luxembourg
E-mail: rip.reach@arcelormittal.com

¹ ArcelorMittal Liège Upstream is now part of ArcelorMittal Belgium



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1.4. Emergency telephone number

Emergency number:

Americas: 1-760-476-3962 + Access Code: 333211
Europe, Middle East & Africa: 1-760-476-3961 + Access Code: 333211
Asia Pacific: 1-760-476-3960 + Access Code: 333211

Emergency Fax:

+352 4792 89 3756

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Directive 67/548/EEC or 1999/45/EC as amended

This substance does not meet the criteria for classification according to Directive 67/548/EEC as amended.

Classification according to Regulation (EC) No 1272/2008 as amended

This substance does not meet the criteria for classification according to Regulation (EC) 1272/2008 as amended.

Hazard summary

Physical hazards

Not classified for physical hazards.

Health hazards

Not classified for health hazards.

Environmental hazards

Not classified for hazards to the environment.

Specific hazards

Slightly alkaline material. Dusts may irritate the respiratory tract, skin and eyes.

Main symptoms

Symptoms include itching, burning, redness and tearing.

2.2 Label elements

Label according to Regulation (EC) No. 1272/2008 as amended

Identification number	65996-69-2
Hazard pictograms	None.
Signal words	None.
Hazard statements	The substance does not meet the criteria for classification.

Precautionary statements

Prevention	Not assigned.
Response	Not assigned.
Storage	Not assigned.
Disposal	Not assigned.

Supplemental label information

None.

2.3 Other hazards

Not assigned.

SECTION 3: Composition/information on ingredients

3.1. Substances

Chemical name	%	CAS-No. / EC No.	REACH Registration No.	INDEX No.	Notes
Slags, ferrous metal, blast furnace	100	65996-69-2 266-002-0	-	-	-
Classification :	DSD: -				
	CLP: -				

DSD: Directive 67/548/EEC.

CLP: Regulation No. 1272/2008.

**Composition comments**

Description: Granulated blast furnace slags are by-products of the manufacture of iron by thermochemical reduction in the blast furnace. Blast furnace slag is formed in a continuous process by the fusion of limestone (and/or dolomite) and other fluxes with the residues of the carbon source and non-metallic components of the iron bearing materials (e.g. iron ore, iron sinter). Blast furnace slag is generated at temperature above 1500°C. The granulated blast furnace slags are water-cooled which give hydraulic properties related to vitrification. The structure of the granulated slag depends on the temperature during cooling. The substance is prominently glassy.

SECTION 4: First aid measures**General information**

Get medical attention if symptoms occur.

4.1. Description of first aid measures**Inhalation:**

In the event of accident by inhalation, move the victim away from the contaminated area, by taking all the necessary precautions, and make him rest. In the event of conscience disorders, put the victim on his side in the safety position while waiting for the medical help. In the event of respiratory disorders, provide respiratory assistance while waiting for the medical help. Seek medical advice.

Skin contact:

Use a Diphotérine® type neutralizing solution. Wash off immediately with plenty of water. If skin irritation occurs: Get medical advice/attention.

Eyes contact:

Use a Diphotérine® type neutralizing solution. Rinse immediately with plenty of water, also under the eyelids. Seek medical attention.

Ingestion

Do NOT induce vomiting. Clean mouth with water (only if person is conscious).

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

Dust may irritate the eyes and the respiratory system. Prolonged exposure may cause skin irritation.

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

Provide general supportive measures and treat symptomatically.

SECTION 5: Fire fighting measures**General fire hazards**

The substance is non-combustible.

5.1. Extinguishing media**Suitable extinguishing media**

Water spray, wet sand or wet earth.

Unsuitable extinguishing media

None known.

5.2. Special hazards arising from the substance or mixture

None known.

5.3. Advice for firefighters**Special protective equipment for firefighters**

Wear self-contained breathing apparatus and protective clothing.

Special firefighting procedures

Use fire-extinguishing media appropriate for surrounding materials.

SECTION 6: Accidental release measures**6.1. Personal precautions, protective equipment and emergency procedures****For non-emergency personnel**

Ensure adequate ventilation. Avoid generation and spreading of dust. Keep unnecessary personnel away. Use personal protection as recommended in section 8 of the SDS.

For emergency responders

Avoid inhalation of dust. In case of inadequate ventilation, use respiratory protection. Avoid contact with skin and eyes. Use personal protection as recommended in section 8 of the SDS. Keep unprotected personnel away.

**6.2. Environmental precautions**

Prevent further leakage or spillage if safe to do so. Do not allow to enter drains, sewers or watercourses. Contact local authorities in case of spillage to drain/aquatic environment. Retain and dispose of contaminated wash water.

6.3. Methods and material for containment and cleaning up

Clean up promptly by sweeping or vacuum. Reduce airborne dust and prevent scattering by moistening with water. Following product recovery, flush area with water.

6.4. Reference to other sections

For personal protection, see section 8. For waste disposal, see section 13.

SECTION 7: Handling and storage**7.1. Precautions for safe handling**

Avoid handling which leads to dust formation. Avoid contact with skin and eyes. Use Personal Protective Equipment recommended in section 8 of the SDS. Handle in accordance with good industrial hygiene and safety practices. Use this product with adequate ventilation.

Good personal hygiene is necessary. Wash hands and contaminated areas with water and soap before leaving the work site. Remove and wash contaminated clothing promptly.

7.2. Conditions for safe storage, including any incompatibilities

Keep away from food and drinking water.

7.3. Specific end use(s)

PROC codes are listed in Section 16.

SECTION 8: Exposure controls/personal protection**8.1. Control parameters****Occupational Exposure limit values****UK. OELs. Workplace Exposure Limits (WELs) (EH40/2005), as amended through December 2011**

Components/decomposition	Type	Value	Form
Dust(CAS -)	TWA	4 mg/m ³	Respirable fraction
		10 mg/m ³	Inhalable Fraction
Aluminium oxides (CAS 1344-28-1)	TWA	4 mg/m ³	Respirable fraction
		10 mg/m ³	Inhalable Fraction
Magnesium oxide (CAS 1309-48-4)	TWA	4 mg/m ³	Respirable fraction as Mg
		10 mg/m ³	Inhalable Fraction as Mg
Calcium oxide (CAS 1305-78-8)	TWA	2 mg/m ³	-
Silica, amorphous -fused	TWA	0,08 mg/m ³	Respirable fraction
Manganese (CAS 7439-96-5) and its inorganic compounds	TWA	0.5 mg/m ³	-

Ireland. OELs (2011 Code of Practice for the Safety, Health and Welfare at Work [Chemical Agents] Regulations 2001, (S.I. No. 619 of 2001))

Components/decomposition	Type	Value	Form
Dust (CAS -)	TWA	4 mg/m ³	Respirable fraction
		10 mg/m ³	Inhalable Fraction
Aluminium oxides (CAS 1344-28-1)	TWA	4 mg/m ³	Respirable fraction
		10 mg/m ³	Inhalable Fraction
Magnesium oxide (CAS 1309-48-4)	TWA	4 mg/m ³	Respirable fraction
		10 mg/m ³	Inhalable Fraction (total dust)
Calcium oxide (CAS 1305-78-8)	TWA	2 mg/m ³	-



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Silica, amorphous -fused	TWA	0.08 mg/m ³	Respirable fraction
Manganese (CAS 7439-96-5) and compounds	TWA	0.2 mg/m ³	As Mn
Sulphur dioxide (CAS 7446-09-5)	TWA	1.3 mg/m ³	-
		0.5 ppm	-
	STEL	2.6 mg/m ³	-
		1 ppm	-

Europe: Value for calcium oxide according Scientific Committee on Occupational Exposure Limits (SCOEL): 1mg/m³ respirable dust.

Recommended monitoring procedures

Follow standard monitoring procedures.

Predicted No Effect Concentration (PNEC)

Substance	Type	Value
Granulated blast furnace slag (GBS) (CAS 65996-69-2)	Aqua (marine water)	0,5 g/l
	Aqua (freshwater)	5 g/l
	Aqua (intermittent releases)	5 g/l
	Soil	1000 mg/Kg
	Sewage Treatment Plant	10g/l

8.2. Exposure controls

Appropriate engineering controls

Observe occupational exposure limits and minimise the risk of inhalation of dust. Provide adequate local exhaust ventilation to maintain worker exposure below exposure limits. Provide eyewash station and safety shower.

Individual protection measures, such as personal protective equipment

General information

Personal protective equipment should be chosen according to the CEN standards and in discussion with the supplier of the personal protective equipment. Personal protective equipment should be suitable for use with alkaline materials.

Eye/face protection

Wear safety glasses with side shields.

Skin protection

- Hand protection

Chemical resistant gloves (conform to 89/686/EEC). Suitable gloves can be recommended by the glove supplier.

- Other

Chemical resistant clothing is recommended. Protective shoes or boots.

Respiratory protection

In case of inadequate ventilation or risk of inhalation of dust, use suitable respiratory equipment with particle filter (type P2).

Thermal hazards

Not applicable.

Hygiene measures

Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

Environmental exposure controls

Contain spills and prevent releases and observe national regulations on emissions.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	Solid.
Form	Granular.
Colour	Grey to yellow.
Odour	Odourless.
Odour threshold	Not available.



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pH

9 - 12,5 (Approximate)

Melting point/freezing point

1100 - 1400 °C (2012 - 2552 °F). Value used for the chemical safety assessment (CSA): 1400 °C at 1013 hPa

Boiling point, initial boiling point, and boiling range

> 2000 °C (> 3632 °F)

Flash point

Not applicable.

Auto-ignition temperature

Not applicable.

Flammability (solid, gas)

Non flammable.

Flammability or explosive limits

Flammability limit – lower (%)

Not available.

Flammability limit – upper (%)

Not available.

Vapour pressure

Negligible. Value used for the chemical safety assessment (CSA): 0.000000001 Pa at 20 °C

Vapour density

Not applicable.

Relative density

2.4 – 3 g/cm³ (25°C). Value used for the chemical safety assessment (CSA): 3 g/cm³

Solubility (water)

Negligible (soluble fraction < 1%). Value used for the chemical safety assessment (CSA): 0.01 mg/L at 20 °C

Partition coefficient (n-octanol/water)

Value used for the chemical safety assessment (CSA): Log Kow (Pow): -9 at 20 °C.

Decomposition temperature

Not available.

Viscosity

150 - 1500 cP (1100 - 1400°C) (Krajewski and Krueger 1984)

Oxidising properties

Not oxidizing.

Explosive properties

Not explosive.

9.2. Other information

Granulometry

0 - 5 mm

SECTION 10: Stability and reactivity

10.1. Reactivity

Stable at normal conditions.

10.2. Chemical stability

The substance is stable under normal conditions of use, storage and transport.

10.3. Possibility of hazardous reactions

Contact with acids liberates toxic gas. Hydrogen sulfide.

10.4. Conditions to be avoided

Not available.

10.5. Incompatible materials

Avoid contact with acids.

10.6. Hazardous decomposition products

Contact with acids liberates toxic gas. Hydrogen sulfide.

SECTION 11: Toxicological information

General information

Not available.

Information on likely routes of exposure

Ingestion

May cause irritation of the gastrointestinal tract. May cause irritation to mucous membranes and burning sensations.

Inhalation

Dust irritates the respiratory system, and may cause coughing and difficulties in breathing.

Skin contact

Prolonged or repeated skin contact may cause irritation.

Eye contact

Dust in the eyes will cause irritation.

Symptoms

Eye contact: Symptoms include itching, burning, redness, and tearing of eyes.

11.1. Information on toxicological effects

Acute toxicity

Not classified. Expected to be a low ingestion hazard.

Product	Specie	Test results
Granulated blast furnace slag (GBS) (65996-69-2)		
Acute		
<i>Inhalation</i>		
LC ₅₀	Wistar Rat	> 5235 mg/m ³
<i>Oral</i>		
LD ₅₀		2000 mg/kg
Subacute	Wistar Rat	
<i>Inhalation</i>		
NOAEC	Rat	200 mg/ m ³ , study on going
Skin corrosion/irritation		Not classified (New Zealand White rabbit).
Serious eye damage/eye irritation		Not classified (New Zealand White rabbit).
Respiratory sensitisation		Not classified (Dunkin-Hartley guinea pig).
Skin sensitisation		Not classified (Dunkin-Hartley guinea pig).
Germ cell mutagenicity		Not classified. Reversed mutation test, EU method B.13/14, Salmonella typhimurium Mamman cell gene muta-tion test, EU method B.17, Chinese hamster lung fibroblast (V79)
Carcinogenicity		Not classified.
Reproductive toxicity		Not classified.
Specific target organ toxicity - single exposure		Not classified.
Specific target organ toxicity - repeated exposure		Not classified.
Aspiration hazard		Not applicable.
Mixture versus substance information		Not available.
Other information		Not available.

SECTION 12: Ecological information

12.1. Toxicity Not classified.

Product	Specie	Test results
Granulated blast furnace slag (GBS) (65996-69-2)		
Aqua		
<i>Algae</i>	IC ₁₀	Scenedesmus subspicatus > 100 g/l, 72 hours
	IC ₅₀	Scenedesmus subspicatus > 100 g/l, 72 hours
<i>Crustaceans</i>	LC ₅₀	Daphnia magna > 1000 g/l, 48 hours
	EC ₁₀	Daphnia magna > 5 g/l, 21 days
	LC ₀	Daphnia magna > 1000 g/l, 48 hours
<i>Fish</i>	LC ₅₀	Leuciscus idus > 1000 g/l, 96 hours
	LC ₀	Leuciscus idus > 1000 g/l, 96 hours
Other		
<i>Other</i>	EC ₅₀	activated sludge > 10 g/l, 3 hours
	CE ₁₀	activated sludge > 10 g/l, 3 hours

12.2. Persistence and degradability Not relevant for inorganic substances.

12.3. Bioaccumulative potential Not relevant for inorganic substances.

Partition coefficient (n-octanol/water) Value used for the chemical safety assessment (CSA): Log Kow (Pow): -9 at 20 °C.

Bioconcentration factor (BCF)

Not available.

12.4. Mobility in soil

Not available.

12.5. Results of PBT and vPvB assessment

Not relevant for inorganic substances.

12.6. Other adverse effects

No negative ecological effects are expected based on current knowledge. In a natural and environmentally harmless manner the substance displays a germination inhibiting effect at the site of application. This should be taken into account especially when used in areas where natural fauna and flora are protected. Due to the risk of increasing the pH of the environment, when used in slow flowing or still waters oxygenation is recommended and application rates should be adapted to avoid detrimental effects.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Residual waste

Dispose in accordance with applicable federal, state, and local regulations

Contaminated packaging

Dispose of empty containers according to applicable federal, state/provincial and/or local regulations.

EU waste code

Waste codes should be assigned by the user based on the application for which the product was used. The substance and wastes from the processing of the substance are not regarded as dangerous pursuant to Decision 2001/118/EC concerning the list of waste.

EWC Code: 10 02 01.

Convention of Basle: B 1200

SECTION 14: Transport information

ADR

The product is not covered by international regulation on the transport of dangerous goods.

RID

The product is not covered by international regulation on the transport of dangerous goods.

ADN

The product is not covered by international regulation on the transport of dangerous goods.

IATA

The product is not covered by international regulation on the transport of dangerous goods.

IMDG

The product is not covered by international regulation on the transport of dangerous goods.

14.1. UN number

not applicable

14.2. UN Proper shipping name

not applicable

14.3. Transport hazard class(es)

not applicable

14.4. Packing group

not applicable.

14.5. Environmental hazards

not applicable

14.6. Special precautions for user

not applicable.

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not applicable

SECTION 15: Regulatory information

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

EU regulations

Regulation (EC) No 1005/2009 on substances that deplete the ozone layer, Annex I

Not listed.

Regulation (EC) No 1005/2009 on substances that deplete the ozone layer, Annex II

Not listed.



Regulation (EC) No. 850/2004 on persistent organic pollutants, Annex I

Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 1

Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 2

Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 3

Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex V

Not listed.

Regulation (EC) No. 1907/2006, REACH Article 59(1). Candidate List

Not listed.

Regulation (EC) No 1005/2009 on substances that deplete the ozone layer

Not listed.

Regulation (EC) No 166/2006 concerning the establishment of a European Pollutant Release and Transfer Register, Annex II

Not listed.

Authorisations

Regulation (EC) No. 1907/2006, Annex XIV, Substances under authorisation

Not listed.

Use restrictions

Regulation (EC) No. 1907/2006, Annex XVII, restrictions on the manufacture, placing on the market and use of certain dangerous substances, preparations and articles

Not listed.

Directive 2004/37/EC on the protection of workers from the risks related to exposure to carcinogens or mutagens at work

Not regulated.

Directive 92/85/EEC on the introduction of measures to encourage improvements in the safety and health at work of pregnant workers and workers who have recently given birth or are breastfeeding

Not regulated.

Other EU regulations

Directive 96/82/EC (Seveso II) on the control of major-accident hazards involving dangerous substances

Not regulated.

Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work

Not regulated.

Directive 94/33/EC on the protection of young people at work

Not regulated.

Other regulations

This Safety Data Sheet complies with the requirements of Regulation (EC) No 1907/2006 as amended. This substance does not meet the criteria for classification according to Regulation (EC) 1272/2008 (CLP Regulation) and Directive 67/548/EEC and their amendments respectively.

National regulations

Follow national regulation for work with chemical agents.

15.2. Chemical safety assessment

A chemical safety assessment has been carried out.

SECTION 16: Other information'

List of abbreviations

DSD: Directive 67/548/EEC.
 CLP: Regulation No. 1272/2008.
 DNEL: Derived No-Effect Level.
 PNEC: Predicted No-Effect Concentration.
 LD₅₀: Lethal Dose, 50%.
 LC₅₀: Lethal Concentration, 50%.
 EC₅₀: Effective concentration, 50%.
 IC_x: inhibition concentration, x%
 PBT: Persistent, bioaccumulative and toxic.
 vPvB: Very Persistent and very Bioaccumulative.
 NOAEC: No observed Adverse Effect Concentration
 TWA: Time Weighted Average
 STEL: Short Term Exposure Limit
 REACH dossier for substance
 Not available.

References

Information on evaluation method leading to the classification of mixture

Full text of any statements or R-phrases and H-phrases under Sections 2 to 15

None.

Training information

Follow training instructions when handling this material.

Updates

Version number	Modifications
1	First Edition
2	Section 1.1: Addition of a legal entity
3	New ArcelorMittal format of SDS Modification of section 7.2

Process category (PROC) codes

PROC 1: Use in closed process, no likelihood of exposure
 PROC 2: Use in closed, continuous process with occasional controlled exposure
 PROC 3: Use in closed batch process (synthesis or formulation)
 PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises
 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 14: Production of preparations or articles by tableting, compression, extrusion, pelletisation
 PROC 19: Hand-mixing with intimate contact and only PPE available
 PROC 21: Low energy manipulation of substances bound in materials and/or articles
 PROC 22: Potentially closed processing operations with minerals/metals at elevated temperature. Industrial setting



PROC 23: Open processing and transfer operations with minerals/metals at elevated temperature

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

Comments to Users:

This sheet is in compliance with the article 31 of the REACH regulation n°1907-2006.

This sheet supplements but does not replace instruction manuals. The information contained herein is given to the best of our knowledge concerning the substance indicated on the date on which it was updated. Information is provided in good faith.

Attention of users is also drawn to possible risks which may arise if the substance is applied for purposes other than those for which it has been designed.

This safety data sheet does not in any way exempt the user from knowing and complying with all regulatory texts applying to his or her activity. The user takes full responsibility for knowing and taking the precautions related to the use of the substance. References to regulatory provisions are given to assist the user in fulfilling the obligations incumbent on persons using a substance or a dangerous mixture.

All local and international measures and provisions which could apply should be referred to.

Attention of users is drawn to the possible existence of other provisions supplementing these rules.

This list is not to be taken as comprehensive. It does not exempt the user from ensuring that obligations under texts other than those to which reference is made do not apply to the detention and use of the substance, for which the user alone is responsible.