PRODUCT SAFETY DATA SHEET

for

Grasimat artificial aggregate – granular ferrosilicomanganese slag

(Prepared according to Annex II of the EP and Council Regulation 1907/2006/EC and Commission Regulation (EU) 2020/878)

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND THE COMPANY/UNDERTAKING

1.1 Product identifier

Name of substance:	Grasimat artificial aggregate - granular ferrosilicomanganese slag
Chemical name:	273-733-9 / Slag from the production of SiMn
Synonyms:	Grasimat artificial aggregate, Grasimat
Trade name:	Grasimat artificial aggregate - granular ferrosilicomanganese slag
EINECS:	273-733-9
CAS :	69012-33-5
Molecular weight range:	32.0 – 236.0
REACH registration number:	01-2119440597-32-0003

1.2 Relevant identified uses of the substance/mixture and uses advised against

Brief description of the uses of the substance:

See the identified ways of using the substance/preparation in Table 1 of the Annex to the Safety Data Sheet.

Uses not recommended:	Other uses than those listed in Table 1 of the Annex to the Safety Data Sheet.

1.3 Details of the supplier of the safety data sheet

Name:	OFZ, a.s.
Address:	Široká 381, 027 41 Oravský Podzámok, Slovakia
Phone number:	+421 /43/5804 111
Fax number:	+421/43/5804 320

E-mail: ofz@ofz.sk

1.4 Emergency telephone number

European emergency tel. number: 112

Emergency phone number company: +421/43/5804 111

National toxicological information center: +421 2 5477 4166

2. HAZARDS IDENTIFICATION

2.1 Classification of substance or mixture

2.1.1 Classification of the substance according to the CLP / GHS regulation

The substance does not meet the criteria for classification in accordance with Regulation EC 1272/2008.

2.2 Label elements

2.2.1 Labeling according to the CLP / GHS regulation

The substance does not meet the criteria for classification in accordance with Regulation EC 1272/2008.

Signal word: None

2.3 Other hazards

The substance does not meet the criteria for classification as a PBT or vPvB substance.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Description: UVCB substance, containing metal oxides, obtained as a by-product of FeSiMn alloy production.

Degree of purity: 100.0% (w/w)

3.1 Constituents

Constituents	Typical concentration	Concentration span	Notes
SiO_2 (silicon dioxide) CAS: 7631-86-9 EINECS: 231-545-4	not determined (UVCB substances)	30.0 - 50.0% (w/w)	
CaO (calcium oxide) CAS: 1305-78-8 EINECS: 215-138-9	not determined (UVCB substances)	10.0 - 30.0% (w/w)	
Al_2O_3 (aluminium (III) oxide) CAS: 1344-28-1 EINECS: 215-691-6	not determined (UVCB substances)	5.0-25.0% (w/w)	
MnO (manganese oxide) CAS: 1344-43-0 EINECS: 215-695-8	not determined (UVCB substances)	5.0-20.0% (w/w)	

3.2 Admixtures

The substance does not contain any additives necessary for classification and labeling.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General information: In contact with clothes, skin and eyes, no damage to health is expected. However, in the event of an accident or persistent discomfort, seek medical attention immediately.

Inhalation: Mechanical irritation of the respiratory tract: Move the person out of the dusty area.

Skin contact: Wash the skin with water and/or mild soap.

Eye contact: Flush the eyes with water or saline solution. In case of persistent discomfort, consult a doctor.

4.2 Most important symptoms and effects, both acute and delayed

There is no danger of acute poisoning or damage to health - the substance is not classified.

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable:

Grasimat artificial aggregate is not flammable and its dust does not pose a threat of explosion.

Unsuitable:

Not established.

5.2 Special hazards arising from the substance or mixture

None.

5.3 Advice for firefighters

Not established.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

6.1.1 For non-emergency personnel

Wear suitable protective equipment (see section 8).

6.1.2 For emergency personnel

Ensure adequate ventilation. Keep the closed spaces well-ventilated before entering.

Avoid stirring up and formation of dust.

Do not allow the unprotected persons to approach the given place.

Wear appropriate protective equipment. (see section 8).

Avoid inhalation: make sure the area is well-ventilated or wear suitable respirators, or protective equipment. (see section 8).

6.2 Environmental precautions

Based on the available studies, the given substance does not endanger the environment. However, large amounts of material can clog drains, so disposing of it in this way is not recommended.

6.3 Methods and material for containment and cleaning up

Material in the form of dust should be collected in suitable containers to prevent inhalation of dust particles.
Use suitable respirators for respiratory protection.

6.4 Reference to other sections

For more detailed information regarding exposure controls and personal protective equipment, see section 8.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Grasimat artificial aggregate is supplied in bulk. For transportation, use vehicles with a tilting body and railway cars designed for the transportation of bulk materials.
Avoid stirring up and formation of dust. Wear protective clothes, gloves and safety glasses.
Wear suitable respirators where necessary.

7.2 Conditions for safe storage, including any incompatibilities

The substance is stored on the reinforced surfaces in the uncovered piles.

7.3 Specific end use(s)

None. Please check the identified uses of the substance included in Table 1 of the Annex to the Safety Data Sheet.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Exposure limit values

Occupational Exposure Limit (OEL): 10 mg/m^3 of inhalable dust from Grasimat production

Derived No Effect Limit (DNEL) for long-term exposure: None. For the systemic effects of dermal and inhalation exposure, no DNEL was derived based on the fact that there would be no dermal exposure (due to PSD tests indicating no inhalation risk) and no dermal absorption of inorganic substances .

PNEC $_{water}$: Not required. A study of the solubility of the substance showed that the concentration of manganese released from the substance (1 µg/L after 28 days from a load of 1 mg/L) is lower than the concentration of manganese in the natural European environment (15.9 µg Mn/L of surface waters).

PNEC $_{soil}$: Not required. A study of the solubility of the substance showed that the concentration of manganese released from the substance (1 µg/L after 28 days from a load of 1 mg/L) is lower than the concentration of manganese in the natural European environment (428.6 mg/kg soil).

PNEC $_{sediment}$: Not required. A study of the solubility of the substance showed that the concentration of manganese released from the substance (1 µg/L after 28 days from a load of 1 mg/L) is less than the concentration of manganese in the natural European environment (452 mg/kg sediment).

8.2 Exposure controls

To control possible exposure, it is necessary to prevent dust from becoming airborne. The use of suitable protective equipment is recommended. In case of visible accumulation of dust from Grasimat artificial aggregate, take occupational safety measures preventing the accumulation of fine dust above 10 mg/m³ at the workplace.

8.2.1 Workplace exposure control

Measure the workplace exposure limit regularly. If dust is generated during the handling of the material, use an extraction or ventilation system or other means to maintain dust limit values in the air.

8.2.2 Personal protective equipment

8.2.2.1 Eye/face protection

Wear safety glasses.

8.2.2.2 Skin protection

Wear protective clothing, gloves and use protective hand cream.

8.2.2.3 Protection of the respiratory system

Use a respirator.

8.2.3 Control of environmental exposure

Environmental exposure measurements have not detected concentrations that could pose a threat to the environment.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance:	grey-green solid substance
Odor:	none
Odor threshold:	none, the substance is odorless
pH:	not determined
Boiling point:	not determined (substance in a solid state with a melting point > 300°C)
Melting point/freezing point:	expected > 1000 °C at 101.3 kPa
Flash point:	not determined (substance is inorganic)
Flammability:	non-flammable (method EU A.10)
Explosive properties:	not explosive (no chemical groups with explosive properties)
Oxidizing properties:	does not oxidize (method EU A.17)
Vapor pressure:	not determined (melting temperature > 300°C)
Bulk weight :	635 ± 100 kg/m ^{3}
Solubility in water:	not soluble
Distribution coefficient n- octanol / water (log. value):	not determined (substance is inorganic)
Viscosity:	not determined (at normal ambient temperature, the substance is solid and not liquid)
Auto-ignition temperature:	none
Dissociation constant:	the substance does not decompose due to the lack of appropriate functional groups
Surface tension:	the substance is not active on the surface

Stability in organic solvents:	not determined (substance is inorganic)
Mass activity index	≤ 1

9.2 Other information

No further information is available regarding the safe use of the substance.

10. STABILITY AND REACTIVITY

10.1 Reactivity

No data are available for this substance.

10.2 Chemical stability

Under normal temperature conditions, conditions of storage and use, the given substance is stable.

10.3 Possibility of dangerous reactions

If the material is handled and stored according to the instructions, there is no risk of dangerous reactions.

10.4 Conditions to avoid

There are no dangerous reactions due to temperature, light pressure and impact.

10.5 Incompatible Materials

None

10.6 Hazardous decomposition products

They are not, if the preparation is used in accordance with the intended use.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

End points	The result of the impact assessment
Toxicokinetics	The Grasimat artificial aggregate as a tested material is only slightly soluble in water. A detailed analysis of the particle size distribution of the test material indicates that the substance does not pose a health risk through inhalation, as more than 96% of the test material was larger than 100 μm.

	Any material that is ingested is very likely to pass through the gastrointestinal tract (GIT) unchanged. The tested material has an unusually low potential for absorption by ingestion, inhalation or skin.
Acute toxicity	Grasimat artificial aggregate is not acutely toxic. Results of animal studies: Ingestion: LD_{50} > 2,000 mg/kg body weight EU method B.1,rat Inhalation: not suitable, very small level of particles that is inhalable, < 3.5% particles < 100 μm Through the skin: LD_{50} > 2,000 mg/kg body weight EU method B.3,rat Grasimat Artificial Aggregate in the framework of acute toxicity is not guaranteed.
Skin corrosion/Skin irritation	Grasimat artificial aggregate is neither irritating nor corrosive. Results of animal studies: Artificial aggregate Grasimat does not irritate the skin (rabbit, OECD 404, method EU B.4, method EU B.46. OECD 431). Based on the negative results of *in vivo* studies for the skin, the substance is not classified as an irritant for the respiratory tract either. *In vitro* tests indicate that the substance is not even corrosive. Grasimat Artificial Aggregate in terms of irritation and corrosiveness is not guaranteed.
Serious eye damage/Eye irritation	Grasimat artificial aggregate is neither irritating nor corrosive. Results of animal studies: Grasimat artificial aggregate does not irritate the eyes (rabbit, OECD 405, method EU B.5). Based on the negative results of *in vivo* studies for the eyes, the substance is not classified as an irritant for the respiratory tract either. *In vitro* tests indicate that the substance is not even corrosive. Grasimat Artificial Aggregate in terms of irritation and corrosiveness is not guaranteed.
Respiratory or skin sensitization	Grasimat artificial aggregate does not cause hypersensitivity. Results of animal studies: Sample analysis for hypersensitivity of local lymph nodes (OECD 429, method EU B.42. mouse): non-irritating The local lymph node hypersensitivity (LLNA) test was negative, and therefore this substance does not cause skin hypersensitivity and is not

	included in this group of substances. With the lack of respirable particles in the substance and a negative LLNA test, it is concluded that the substance will not cause hypersensitivity of the respiratory tract either. Grasimat Artificial Aggregate in the framework of sensitization is not guaranteed.
Germ cell mutagenicity	Grasimat artificial aggregate is not genotoxic . Results of animal studies: Analysis of a sample of bacteria for the presence of a reverse mutation (Ames test, OECD 471): negative Test for the presence of reverse mutation using bacteria (method EU B.13/14): negative *In vitro* test for the presence of cellular gene mutation in mammals (OECD 476): negative *In vitro* test for the presence of chromosome anomalies in mammals (OECD 473): negative *In vivo* test of erythrocyte nuclei in mammals (OECD 474): negative Ames test substance negative. Negative results of $MnCl_2$ in all tests performed (3 tests *in vitro* and 1 test *in vivo*). On the basis of these facts, the inclusion of the substance in the scope of mutagenicity is considered unjustified. Grasimat Artificial Aggregate in terms of genotoxicity is not guaranteed.
Carcinogenicity	Grasimat artificial aggregate is not carcinogenic. carcinogenicity of the given substance has been found in humans due to exposure . This evidence, together with the negative genotoxicity tests , is considered sufficient to justify the inclusion of the substance under this group. The inclusion of FeSiMn in the scope of carcinogenicity is not guaranteed.
Reproductive toxicity	Grasimat artificial aggregate is not toxic for reproduction. Pursuant to Article 14(4) of Regulation No. 1907/2006, the substance subject to registration is not subject to any exposure assessment and testing of this endpoint is omitted (see paragraph " Toxikokinetics " or "Repeated dose toxicity"). Since the classification of a substance is based on its risks, it is assumed that the lack of these real risks based on the physical and chemical properties of the substance justifies it not being included in this group. Grasimat Artificial Aggregate in terms of reproductive toxicity is not guaranteed.
Specific target organ toxicity (STOT) - single exposure	Based on the available data, the criteria for inclusion of the substance are not met.

Specific target organ toxicity (STOT) - repeated exposure	Artificial aggregate Grasimat is not toxic after a repeated dose. Toxicity of Grasimat Artificial Aggregate: Exposure to this substance by ingestion is not expected and therefore this route of exposure is not considered relevant. Absorption of manganese is very low (approximately 5% based on TK assessment) and is very unlikely to cause any systemic effects if ingested. This statement is supported by the absence of systemic toxicity in studies of acute toxicity by ingestion (study carried out in accordance with the EU B1 method) . Dermal Toxicity of Grasimat Synthetic Aggregate: A repeated dose dermal toxicity study does not need to be performed, as the physiological properties of the substance do not indicate a significant rate of absorption through the skin and no systemic effects or evidence of absorption were observed in eye or skin irritation studies, and furthermore the solubility of the substance in water is very weak, and therefore only a limited amount of the potential substance is available for systemic absorption through the skin . toxicity of Grasimat Artificial Aggregate: Testing of this endpoint is omitted on the basis that inhalation exposure is not likely, as the particle size distribution indicates that the substance does not pose a real inhalation risk . Based on the particle distribution test, the substance does not present a real risk by inhalation. It is very poorly soluble in water and manganese is released into artificial gastric and lung fluid in bioavailability studies Manganese absorption through the skin is very low. Based on these facts, the classification of the substance as toxic by any means of exposure is not justified. Grasimat Artificial Aggregate in the scope of toxicity after a repeated dose is not guaranteed.
Risk of aspiration	Lack of data.

12. ECOLOGICAL INFORMATION

12.1 Ecotoxicity

12.1.1 Acute and chronic toxicity to fish

Short-term toxicity: Not required due to the low concentration of manganese released from this substance (1 µg/L after 28 days from a load of 1 mg/L) is less than the concentration of manganese in the natural European environment (15.9 µg Mn/L surface waters, 452 mg/kg sediment, 428.6 mg/kg soil).

Long-term toxicity : According to column 2 of REACH Annex IX, long-term test studies on fish need not be carried out as there are mitigating factors indicating that aquatic toxicity is not likely to occur.

12.1.2 Acute and chronic toxicity for aquatic invertebrates

Short-term and long-term toxicity: Pursuant to column 2 of REACH Annex IX, long-term test studies on invertebrates need not be carried out as there are mitigating factors indicating that aquatic toxicity is not likely to occur.

12.1.3 Acute and chronic toxicity to aquatic plants

Short-term and long-term toxicity: Pursuant to column 2 of REACH Annex VII, an aquatic plant growth retardation study need not be carried out as there are mitigating factors indicating that aquatic toxicity is not likely to occur.

12.1.4 Acute and chronic toxicity for sedimentary organisms

Short-term and long-term toxicity: According to column 2 of the REACH Annex X regulation, a study of long-term toxicity on sedimentary organisms does not need to be carried out, since no such endpoint is included in the chemical safety assessment .

12.1.5 Acute and chronic toxicity for soil macro-organisms

Short-term toxicity: In accordance with paragraph 1 of the REACH Regulation Annex XI (testing does not appear to be scientifically necessary), a short-term toxicity study on invertebrates does not need to be carried out.

Long-term toxicity: According to column 2 of the REACH Regulation Annex X, a study of long-term toxicity on invertebrates does not need to be carried out, since no such endpoint is included in the chemical safety assessment.

12.1.6 Acute and chronic toxicity for terrestrial plants

Short-term toxicity: According to paragraph 1 of the REACH Regulation Annex XI (testing does not appear to be scientifically necessary), a short-term toxicity study on plants does not need to be carried out.

Long-term toxicity: According to column 2 of the REACH Regulation Annex X, a study of long-term toxicity on plants does not need to be carried out, since no such endpoint is included in the chemical safety assessment.

12.1.7 Acute and chronic toxicity for soil microorganisms

Pursuant to paragraph 1 of the REACH Regulation Annex XI (testing does not appear to be scientifically necessary), a study on microbes does not need to be carried out.

12.1.8 Acute and chronic toxicity for aquatic microorganisms

Pursuant to column 2 of REACH Annex VIII, an ASRIT does not need to be carried out as there are mitigating factors indicating that water toxicity is not likely to occur.

12.1.9 Acute and chronic toxicity to birds

Pursuant to paragraph 1 of REACH Annex XI (testing does not appear to be scientifically necessary), a long-term reproductive toxicity study in birds does not need to be carried out, as this study does not appear to be scientifically necessary.

12.1.10 General conclusion

The solubility test showed that the concentration of manganese released from this substance (1 µg/l after 28 days from a load of 1 mg/L) is less than the concentration of manganese in the natural European environment (15.9 µg Mn/L surface waters, 452 mg/ kg sediment, 428.6 mg/kg soil). Therefore, toxicity data for Grasimat Artificial Aggregate were not required due to the low exposure. By the same reasoning, the determination of PNEC values was also not required.

12.2 Mobility

A screening test for the absorption and desorption of the substance is not technically possible due to the physical nature of Grasimat Artificial Aggregate. A study of the solubility of the substance showed that the concentration of manganese released from the substance (1 µg/l after 28 days from a charge of 1 mg/L) is less than the concentration of manganese in natural European soils (428.6 mg/kg) .

12.3 Permanence and degradability

It is not established for inorganic substances.

12.4 Bioaccumulative potential

bioaccumulation studies . A study of the solubility of the substance showed that the concentration of manganese released from the substance (1 µg/L after 28 days from a load of 1 mg/L) is lower than the concentration of manganese in natural European surface waters (15.9 µg Mn/L). Manganese is also an important trace element in animal nutrition and is necessary for plant photosynthesis. Thus, it is highly unlikely that undesirable bioaccumulation should occur in any organism due to their ability to regulate intake and output from natural sources (at higher concentrations than those resulting from the use of Grasimat Artificial Aggregates).

12.5 Results of PBT and vPvB assessment

The substance does not meet the criteria for classification as a PBT or vPvB substance.

12.6 Other adverse effects

No other adverse effects were detected.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Grasimat Artificial Aggregate must be in accordance with local and national legislation. Further handling of unconsumed material consists in its placement at a waste dump, including an inert one.

14. TRANSPORT INFORMATION

14.1 Basic information about transportation

Grasimat artificial aggregate is not classified as dangerous in terms of ADR (road transport), RID (rail transport, IMDG (sea transport) and ICAO-TI/IATA-DGR (air transport).
Grasimat artificial aggregate is transported in bulk in tipper trucks or in railway wagons intended for transporting loose materials.

15. REGULATORY INFORMATION

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

GHS - UN Globally Harmonized System of Classification and Labeling of Chemical Substances (GHS):

According to Chapter 1.5.2 of the UN Globally Harmonized System of Classification and Labeling of Chemical Substances (GHS), safety data sheets (SDS) are required only for substances and mixtures that meet the harmonized criteria for endangering safety, health and the environment. This product does not meet these criteria.

EU CLP - CLP Regulation on classification, labeling and packaging of chemical substances and mixtures:

According to Article 59(2)(b) EC no. 1272/2008 (CLP), regulating Article 31(1) of the REACH regulation, safety data sheets (SDS) are required only for substances and mixtures/special preparations that meet the criteria for endangering safety, health and the environment. Since this product does not meet the given criteria, a safety data sheet according to EC 453/2010 does not need to be issued. To provide information related to safety and health and environmental protection, product safety information will be provided instead.

EU REACH - Registration, evaluation and authorization of chemical substances:

According to Article 31(7) of the REACH Regulation, exposure scenarios resulting from the Chemical Safety Report (CSR) are required to be documented as an annex to the Safety Data Sheet. However, according to the REACH regulation Annex I, part 0. (Introduction), subsection 0.6. no. 4 and 5 such exposure scenarios are required only for substances and mixtures that are classified as dangerous. As this product is not classified as hazardous in the sense of CLP, the provision of exposure scenarios is not required." A chemical safety assessment has been carried out for the substance . According to the REACH regulation, this substance does not require authorization.

15.2 Chemical safety assessment

There are no special regulations, restrictions and prohibitions.

16. FURTHER INFORMATION

These data are based on our current knowledge, but do not represent any guarantee of any particular product properties and do not establish any legally binding contractual relationships.

16.1 List of abbreviations used

ASRIT:	biological test measuring the effect of activated sludge on microorganisms
DNEL:	derived no effect limit
LD_{50}:	median lethal dose value
OEL:	workplace exposure limit value
PBT:	persistent, bioaccumulative and toxic substances
PNEC:	predicted no-effect concentration
T/D test:	substance solubility test
UVCB:	substances of unknown or variable composition, products of complex reactions or biological materials
vPvB:	very persistent, very bioaccumulative substances

16.2 List of changes compared to the previous revision

Alignment with TL-OFZ04/19 dated 6/1/2021 – exclusion of monitored compounds MgO, FeO, K_2O, Na_2O and SO_3.

16.3 Key Resources

This Safety Data Sheet was prepared according to the Chemical Safety Report issued on March 24, 2010 and Technical Sheet no. TL-OFZ-04/19.

ANNEX

Table 1 Identified uses of the substance or preparation

Identified method of use	Process category (PROC)	Chemical Product Category (PC)	Environmental release category (ERC)	Sector of Use (SU)	Product category (AC)
Backfill material for creating a bed and backfill of water, sewage and other plastic pipes	PROC 8a, 8b	PC 1	ERC 10a	SU 19	AC 0: C18.2
Sprinkling material for winter maintenance of roads	PROC 8a, 8b	PC 1	ERC 10a	SU 19	AC 0: C18.2
Land reclamation	PROC 8a, 8b	PC 1	ERC 10a	SU 19	AC 0: C18.2
For the production of clinker	PROC 3, 4, 5, 8a, 8b, 9	PC 0	ERC 3, 5	SU 13 SU 0: Other: NACE code: C23	AC 0
Sandblasting material	PROC 2	PC 20	ERC 2	SU 9	-

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