SAFETY DATA SHEET

Functional AgFlake

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

1.1. Product identifier

Trade name

Functional AgFlake

Other names / Synonyms

Functional AgFlake® Coated Glassflake

Product no.

GFEAGF-4035, GFEAGF-2030, GFEAGF-2035

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

Relevant identified uses of the substance or mixture

None known.
Restricted to professional users.

Uses advised against

None known.

1.3. Details of the supplier of the safety data sheet

Company and address

Glassflake Limited
Forster Street
LS10 1PW Leeds
United Kingdom
0113 270 3615
www.glassflake.com

Contact person

Sarah Ross

E-mail

info@glassflake.com

Revision

11/03/2025

SDS Version

2.0

Date of previous version

10/01/2025 (1.0)

1.4. Emergency telephone number

Healthcare professionals: Dial 0344 892 0111 to reach The National Poisons Information Service (NPIS) (24 hour service)
General public:
England - Dial 111 to reach NHS 111 (24 hour service)
Scotland - Dial 112 to reach NHS 24 (24 hour service)
Wales - Dial 111 or 0845 4647 to reach NHS Direct (24 hour service)
See section 4 “First aid measures”.

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Aquatic Acute 1; H400, Very toxic to aquatic life.
Aquatic Chronic 1; H410, Very toxic to aquatic life with long lasting effects.

2.2. Label elements

Hazard pictogram(s)

Signal word

Warning

Hazard statement(s)
Very toxic to aquatic life with long lasting effects. (H410)
Precautionary statement(s)
General
-
Prevention
Avoid release to the environment. (P273)
Response
Collect spillage. (P391)
Storage
-
Disposal
Dispose of contents/container in accordance with local regulation (P501)
▼Hazardous substances
Silver
Additional labelling
EUH210, Safety data sheet available on request.
EUH212, Warning! Hazardous respirable dust may be formed when used. Do not breathe dust.

2.3. Other hazards

Additional warnings
This mixture/product does not contain any substances known to fulfil the criteria for PBT and vPvB classification.

SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable. This product is a mixture.

3.2. Mixtures

Product/substance	Identifiers	% w/w	Classification	Note
Calcium Sodium Borosilicate, Calcium Aluminium Borosilicate, Glass flake	CAS No.: 65997-17-3 EC No.: 266-046-0 UK-REACH: Exempt from REACH Registration. Classified as an Article. Non-hazardous. Index No.:	63-72%		[1], [19]
Silver	CAS No.: 7440-22-4 EC No.: 231-131-3 UK-REACH: Index No.:	28-37%	Aquatic Acute 1, H400 (M=1000) Aquatic Chronic 1, H410 (M=1)	[1]
Tin Oxide	CAS No.: 18282-10-5 EC No.: 242-159-0 UK-REACH: Index No.:	0.5%		[1]

See full text of H-phrases in section 16. Occupational exposure limits are listed in section 8, if these are available.

Other information
[1] European occupational exposure limit.
[19] UVCB = Unknown or variable composition, complex reaction products or of biological materials

SECTION 4: First aid measures

4.1. Description of first aid measures

General information
In the case of accident: Contact a doctor or casualty department – take the label or this safety data sheet. Contact a doctor if in doubt about the injured person's condition or if the symptoms persist. Never give an unconscious person water or other drink.
Inhalation

Upon breathing difficulties or irritation of the respiratory tract: Bring the person into fresh air and stay with him/her.

Skin contact

Upon irritation: rinse with water. In the event of continued irritation, seek medical assistance.

Eye contact

If in eyes: Flush eyes with water or saline water (20-30 °C) for at least 5 minutes. Remove contact lenses. Seek medical assistance and continue flushing during transport.

Ingestion

If the person is conscious, rinse the mouth with water and stay with the person. Never give the person anything to drink.
In case of malaise, seek medical advice immediately and bring the safety data sheet or label from the product. Do not induce vomiting, unless recommended by the doctor. Have the person lean forward with head down to avoid inhalation of or choking on vomited material.

Burns

Not applicable.

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

High amounts of dust can cause coughing and general irritation of the respiratory airways.

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

Treat symptomatically.

Information to medics

Bring this safety data sheet or the label from this product.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media: Alcohol-resistant foam, carbon dioxide, powder, water mist.
Unsuitable extinguishing media: Waterjets should not be used, since they can spread the fire.

5.2. Special hazards arising from the substance or mixture

Fire will result in dense smoke. Exposure to combustion products may harm your health. Closed containers, which are exposed to fire, should be cooled with water. Do not allow fire-extinguishing water to enter the sewage system and nearby surface waters.

5.3. Advice for firefighters

Wear self-contained breathing apparatus and protective clothing to prevent contact. Upon direct exposure contact The National Poisons Information Service (dial 111, 24 h service) in order to obtain further advice.
Hazchem Code: 2Z

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Remove flammable materials if conditions allow it. Ensure sufficient ventilation.
Ensure adequate ventilation, especially in confined areas.
Contaminated areas may be slippery.

6.2. Environmental precautions

Avoid discharge to lakes, streams, sewers, etc. In the event of leakage to the surroundings, contact local environmental authorities.

6.3. Methods and material for containment and cleaning up

Limit spillage and collect using granular absorbent or similar materials, and dispose of it in accordance with the regulations on dangerous waste.
Collect spills carefully. Moist the material with water in order to prevent the formation and propagation of dust.
Wherever possible cleaning should be performed with normal cleaning agents. Avoid use of solvents.

6.4. Reference to other sections

See section 13 “Disposal considerations” on handling of waste.
See section 8 "Exposure controls/personal protection" for protective measures.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

It is recommended to install waste collection trays in order to prevent emissions to the waste water system and surrounding environment.
Smoking, drinking and consumption of food is not allowed in the work area.
See section 8 "Exposure controls/personal protection" for information on personal protection.

7.2. Conditions for safe storage, including any incompatibilities

Containers that have been opened must be carefully resealed and kept upright to prevent leakage.

Recommended storage material
Keep only in original packaging.

Storage conditions
Dry, cool and well ventilated

Incompatible materials
Strong acids, strong bases, strong oxidizing agents, and strong reducing agents.

7.3. Specific end use(s)
This product should only be used for applications quoted in section 1.2.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters
Silver
Long term exposure limit (8 hours) (mg/m³): 0,1

The Control of Substances Hazardous to Health Regulations 2002. SI 2002/2677 The Stationery Office 2002. EH40/2005 Workplace exposure limits (Fourth Edition 2020).

DNEL
Silver

Duration:	Route of exposure:	DNEL:
Long term – Local effects - General population	Inhalation	2.3 µg/m³
Long term – Local effects - Workers	Inhalation	7.6 µg/m³
Long term – Systemic effects - General population	Inhalation	2.3 µg/m³
Long term – Systemic effects - Workers	Inhalation	7.6 µg/m³
Long term – Systemic effects - General population	Oral	110 µg/kg bw/day

Tin Oxide

Duration:	Route of exposure:	DNEL:
Long term – Systemic effects - General population	Dermal	2 mg/kg bw/day
Long term – Systemic effects - Workers	Dermal	5.7 mg/kg bw/day
Short term – Systemic effects - General population	Dermal	2 mg/kg bw/day
Short term – Systemic effects - Workers	Dermal	5.7 mg/kg bw/day
Long term – Systemic effects - General population	Inhalation	6 mg/m³
Long term – Systemic effects - Workers	Inhalation	2 mg/m³
Short term – Systemic effects - General population	Inhalation	6 mg/m³
Short term – Systemic effects - Workers	Inhalation	2 mg/m³
Long term – Systemic effects - General population	Oral	2 mg/kg bw/day
Short term – Systemic effects - General population	Oral	2 mg/kg bw/day

PNEC
Silver

Route of exposure:	Duration of Exposure:	PNEC:
Freshwater		40 ng/L
Freshwater sediment		438.13 mg/kg
Marine water		860 ng/L
Marine water sediment		438.13 mg/kg
Sewage treatment plant		25 µg/L
Soil		1.41 mg/kg

Tin Oxide

Route of exposure:	Duration of Exposure:	PNEC:
Freshwater		100 µg/L
Intermittent release (freshwater)		1 mg/L
Marine water		10 µg/L

Sewage treatment plant	100 mg/L

8.2. Exposure controls

Compliance with the given occupational exposure limits values should be controlled on a regular basis.

General recommendations

Smoking, drinking and consumption of food is not allowed in the work area.

Exposure scenarios

There are no exposure scenarios implemented for this product.

Exposure limits

Professional users are subjected to the legally set maximum concentrations for occupational exposure. See occupational hygiene limit values above.

Appropriate technical measures

Apply standard precautions during use of the product. Avoid inhalation of gas or dust.
Airborne gas and dust concentrations must be kept at a minimum and below current limit values (see above).
Installation of a local exhaust system if normal air flow in the work room is not sufficient is recommended. Ensure emergency eyewash and showers are clearly marked.
Airborne gas and dust concentrations must be kept at a minimum. Provide efficient mechanical ventilation. If not possible use suitable respiratory equipment.

Hygiene measures

In between use of the product and at the end of the working day all exposed areas of the body must be washed thoroughly. Pay special attention to hands, forearms and face.

Measures to avoid environmental exposure

Keep damming materials near the workplace. If possible, collect spillage during work.

Individual protection measures, such as personal protective equipment

Generally

Use only UKCA marked protective equipment.

Respiratory Equipment

Work situation	Type	Class	Colour	Standards	
In the event of short termed exposure or low concentrations	Combination filter AXP1		Brown/White	EN14387, EN143	

Skin protection

Work situation	Recommended	Type/Category	Standards	
In the event of short termed exposure or low concentrations	Wear appropriate protection clothing, e.g. coveralls in polypropylene or working clothes in cotton or polyester.	-	-	

▼Hand protection

Work situation	Material	Glove thickness (mm)	Breakthrough time (min.)	Standards	
In the event of short termed exposure or low concentrations	Nitrile rubber	-	>480	EN374	

Eye protection

Work situation	Type	Standards	
In the event of short termed exposure or low concentrations	Safety glasses with side shields.	EN166	

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state

Powder

Colour

Silver

Odour / Odour threshold

None

pH
7-11
Density (g/cm^3)
1.2 - 40g/100g (See TDS for specific Density)
Kinematic viscosity
Not applicable
Particle characteristics
Size distribution: 20-100 microns. See TDS.

Phase changes
Melting point/Freezing point (°C)
>850
Softening point/range (°C)
688
Boiling point (°C)
No data available
Vapour pressure
Not applicable
Relative vapour density
Not applicable
Decomposition temperature (°C)
No data available

Data on fire and explosion hazards
Flash point (°C)
Not applicable
Flammability (°C)
The material is not combustible.
Auto-ignition temperature (°C)
Not applicable
Lower and upper explosion limit (% v/v)
Not applicable

Solubility
Solubility in water
Insoluble
▼n-octanol/water coefficient (LogKow)
No data available.
▼Solubility in fat (g/L)
No data available.

9.2. Other information
Sensitivity to shock
No
Dust explosion class
St0 (No explosion)
Evaporation rate (n-butylacetate = 100)
Not applicable
Oxidizing properties
No data available
Other physical and chemical parameters
No data available.

SECTION 10: Stability and reactivity

10.1. Reactivity
No data available.
10.2. Chemical stability
The product is stable under the conditions, noted in section 7 “Handling and storage”.
10.3. Possibility of hazardous reactions
None known.
10.4. Conditions to avoid
Extremes of temperature
Generation of dust
10.5. Incompatible materials
Strong acids, strong bases, strong oxidizing agents, and strong reducing agents.

10.6. ▼Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008 as retained and amended in UK law

Acute toxicity

Product/substance	Functional AgFlake
Test method:	OECD 423
Species:	Rat
Route of exposure:	Oral
Test:	LD50
Result:	>2000 mg/kg

Product/substance	Silver
Species:	Rat
Route of exposure:	Dermal
Test:	LD50
Result:	>2,000 mg/kg

Product/substance	Silver
Test method:	OECD 436
Species:	Rat, male/female
Route of exposure:	Inhalation
Test:	LC50
Result:	>5.16 mg/L
Other information:	The substance or mixture has no acute inhalation toxicity

Product/substance	Tin Oxide
Species:	Rat
Test:	LD50
Result:	>2,000 mg/kg

Skin corrosion/irritation

Product/substance	Functional AgFlake
Test method:	OECD 404
Species:	Rabbit
Result:	No adverse effect observed (Not irritating)

Product/substance	Calcium Sodium Borosilicate, Calcium Aluminium Borosilicate, Glass flake
Result:	Mildly irritating

Product/substance	Silver
Test method:	OECD 404
Species:	Rabbit, New Zealand White
Result:	No adverse effect observed (Not irritating)

Serious eye damage/irritation

Product/substance	Functional AgFlake
Species:	Human
Result:	No adverse effect observed (Not irritating)

Product/substance	Calcium Sodium Borosilicate, Calcium Aluminium Borosilicate, Glass flake
Result:	Mildly irritating

Product/substance	Silver
Test method:	OECD 405
Species:	Rabbit
Result:	No adverse effect observed (Not irritating)

Respiratory sensitisation

Product/substance	Functional AgFlake

Product/substance	Calcium Sodium Borosilicate, Calcium Aluminium Borosilicate, Glass flake
Result:	May cause an allergic skin reaction.

Product/substance	Silver

Result: Not classified

Skin sensitisation

Product/substance: Functional AgFlake
Species: Human

Product/substance: Calcium Sodium Borosilicate, Calcium Aluminium Borosilicate, Glass flake
Result: May cause an allergic skin reaction.

Product/substance: Silver
Test method: Buehler Test
Species: Guinea pig
Result: No adverse effect observed (not sensitising)

Germ cell mutagenicity

Product/substance: Functional AgFlake
Conclusion: No evidence of mutagenic propertie

Product/substance: Calcium Sodium Borosilicate, Calcium Aluminium Borosilicate, Glass flake
Conclusion: Not mutagenic

Product/substance: Silver

Carcinogenicity

Product/substance: Functional AgFlake
Conclusion: Not classifiable as a human carcinogen

Product/substance: Functional AgFlake
Species: Rat

Product/substance: Calcium Sodium Borosilicate, Calcium Aluminium Borosilicate, Glass flake
Conclusion: Not classifiable as a human carcinogen

Product/substance: Silver

Reproductive toxicity

Product/substance: Functional AgFlake
Conclusion: No toxicity to reproduction

Product/substance: Calcium Sodium Borosilicate, Calcium Aluminium Borosilicate, Glass flake
Conclusion: No toxicity to reproduction

Product/substance: Silver
Test method: OECD 443
Species: Rat

STOT-single exposure

Product/substance: Functional AgFlake
Other information: No information available

Product/substance: Silver
Test method: OECD 408
Species: Rat
Route of exposure: Dermal

STOT-repeated exposure

Product/substance: Functional AgFlake
Other information: No information available

Product/substance: Silver

Aspiration hazard

Product/substance: Functional AgFlake
Conclusion: No aspiration toxicity classification

Product/substance: Calcium Sodium Borosilicate, Calcium Aluminium Borosilicate, Glass flake
Conclusion: No aspiration toxicity classification

Product/substance: Silver
Other information: No information available

11.2. Information on other hazards

Long term effects

None known.

▼Endocrine disrupting properties

Product/substance	Functional AgFlake
Product/substance	Calcium Sodium Borosilicate, Calcium Aluminium Borosilicate, Glass flake
Product/substance	Silver
Other information:	No information available

This mixture/product does not contain any substances known to have hormone-disrupting properties in relation to health.

Other information

None known.

SECTION 12: Ecological information

12.1. Toxicity

Product/substance	Functional AgFlake
Other information:	No information available
Product/substance	Silver
Species:	Fish
Test:	LC50
Result:	1.2 µg/L
Product/substance	Silver
Species:	Aquatic invertebrates
Duration:	48 hours
Test:	LC50
Result:	0.22 µg/L
Product/substance	Silver
Species:	Microorganisms
Compartment:	Activated sludge, non-adapted
Result:	0.025 other: mg Ag/L

Very toxic to aquatic life with long lasting effects.

12.2. Persistence and degradability

Product/substance	Functional AgFlake
Conclusion:	-
Other information:	No information available
Product/substance	Silver
Conclusion:	-
Other information:	No information available

12.3. Bioaccumulative potential

Product/substance	Functional AgFlake
Conclusion:	-
Other information:	No information available
Product/substance	Silver
Conclusion:	-
Other information:	No information available

12.4. Mobility in soil

No data available.

12.5. Results of PBT and vPvB assessment

This mixture/product does not contain any substances known to fulfil the criteria for PBT and vPvB classification.

12.6. ▼Endocrine disrupting properties

Product/substance	Functional AgFlake
Conclusion:	No adverse effect observed
Product/substance	Silver
Other information:	No information available

This mixture/product does not contain any substances considered to have endocrine-disrupting properties in relation to the environment.

12.7. Other adverse effects

This product contains substances that are toxic to the environment. May result in adverse effects to aquatic organisms.
This product contains substances, which may cause adverse long-term effects to the aquatic environment.

SECTION 13: Disposal considerations

Waste treatment methods

Product is covered by the regulations on hazardous waste. (*)
HP 14 – Ecotoxic
Dispose of contents/container to an approved waste disposal plant.
Regulation (EU) No 1357/2014 of 18 December 2014 on waste as retained and amended in UK law.

EWC code

15 01 03	Wooden packaging
15 01 02	Plastic packaging
10 07 04	Other particulates and dust

Specific labelling

Contaminated packing

Packaging containing residues of the product must be disposed of similarly to the product.

SECTION 14: Transport information

	14.1 UN / ID	14.2 UN proper shipping name	14.3 Hazard class(es)	14.4 PG*	14.5 Env**	Other information:
ADR	UN3077	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Silver)	Transport hazard class: 9 Label: 9 Classification code: M7  	III	Yes	Limited quantities: 5 kg Tunnel restriction code: (-) See below for additional information.
IMDG	UN3077	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Silver)	Transport hazard class: 9 Label: 9 Classification code: M7  	III	Yes	Limited quantities: 5 kg EmS: F-A S-F See below for additional information.
IATA	UN3077	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Silver)	Transport hazard class: 9 Label: 9 Classification code: M7  	III	Yes	See below for additional information.

* Packing group

** Environmental hazards

Additional information

Not dangerous goods according to ADR, IATA and IMDG.
These substances when carried in single or combination packaging's containing a net quantity per single or inner packaging of 5 L or less for liquids or having a net mass per single or inner packaging of 5 kg or less for solids, are not subject to any other provisions of ADR/IMDG/IATA provided the packaging's meet the general provisions of 4.1.1.1, 4.1.1.2, 4.1.1.4 - 4.1.1.8 (ADR, IMDG) / 5.0.2.4.1, 5.0.2.6.1.1, 5.0.2.8 (IATA).
-
ADR / See Table A, section 3.2.1 for any information on special provisions, requirements, or warnings in connection with transport. See section 5.4.3, for instructions in writing regarding mitigation of damages in relation to incidents or accidents during transport.
IMDG / See section 3.2.1, for any information on special provisions, requirements, or warnings in connection with transport.
IATA / See Table 4.2 for any information on special provisions, requirements, or warnings in connection with transport.
Hazchem Code: 2Z

14.6. Special precautions for user

Not applicable.

14.7. Maritime transport in bulk according to IMO instruments

No data available.

SECTION 15: Regulatory information

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

Restrictions for application

Restricted to professional users.

Demands for specific education

No specific requirements.

Control of Major Accident Hazards (COMAH) - Categories / dangerous substances

E1 - ENVIRONMENTAL HAZARDS, Qualifying quantity (lower-tier): 100 tonnes / (upper-tier): 200 tonnes

Additional information

Not applicable.

Sources

Control of Major Accident Hazards (COMAH) Regulations 2015.
Regulation (EU) No 1357/2014 of 18 December 2014 on waste as retained and amended in UK law.
Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures (CLP) as retained and amended in UK law.
Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) as retained and amended in UK law.

15.2. Chemical safety assessment

No

SECTION 16: Other information

Full text of H-phrases as mentioned in section 3

H400, Very toxic to aquatic life.
H410, Very toxic to aquatic life with long lasting effects.

Abbreviations and acronyms

ADN = European Provisions concerning the International Carriage of Dangerous Goods by Inland Waterway
ADR = The European Agreement concerning the International Carriage of Dangerous Goods by Road
ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
CAS = Chemical Abstracts Service
CE = Conformité Européenne (European conformity)
CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
CSA = Chemical Safety Assessment
CSR = Chemical Safety Report
DMEL = Derived Minimal Effect Level
DNEL = Derived No Effect Level
EINECS = European Inventory of Existing Commercial chemical Substances
ES = Exposure Scenario
EUH statement = CLP-specific Hazard statement
EuPCS = European Product Categorisation System
EWC = European Waste Catalogue

GHS = Globally Harmonized System of Classification and Labelling of Chemicals
GWP = Global warming potential
IARC = International Agency for Research on Cancer (IARC)
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
OECD = Organisation for Economic Co-operation and Development
PBT = Persistent, Bioaccumulative and Toxic
PNEC = Predicted No Effect Concentration
RID = The Regulations concerning the International Carriage of Dangerous Goods by Rail
RRN = REACH Registration Number
SCL = A specific concentration limit
SVHC = Substances of Very High Concern
STOT-RE = Specific Target Organ Toxicity - Repeated Exposure
STOT-SE = Specific Target Organ Toxicity - Single Exposure
TWA = Time weighted average
UN = United Nations
UVBC = Unknown or variable composition, complex reaction products or of biological materials
VOC = Volatile Organic Compound
vPvB = Very Persistent and Very Bioaccumulative

Additional information

The classification of the substance/mixture in regard of environmental hazards are in accordance with the calculation methods given by Regulation (EC) No. 1272/2008 (CLP) as retained and amended in UK law.

The safety data sheet is validated by

Sarah Ross

Other

A change (in proportion to the last essential change (first cipher in SDS version, see section 1)) is marked with a triangle.
The information in this safety data sheet applies only to this specific product (mentioned in section 1) and is not necessarily correct for use with other chemicals/products.
It is recommended to hand over this safety data sheet to the actual user of the product. Information in this safety data sheet cannot be used as a product specification.
Country-language: GB-en