

SAFETY DATA SHEET

SECTION 1 Identification of the substance/mixture and of the company/undertaking**1.1 Product identifier**

Product identifier(s): AgFlake Functional Series
 Product Name(s): AgFlake 4035, AgFlake 2030, AgFlake 2035
 Product Code(s): GFEAGF-4035, GFEAGF-2030, GFEAGF-2035

Other means of identification: Calcium Sodium Borosilicate, AgFlake Functional

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

- Use of the substance/mixture: Decorative or functional purposes

1.3 Details of the supplier of the safety data sheet

- Name of Supplier: Glassflake Ltd
 - Address of Supplier: Donisthorpe Street, Hunslet, Leeds, LS10 1PL
 - Telephone: +44 (0) 113 2703615
 - Fax: +44 (0) 113 2718750
 - Email: Info@glassflake.com

1.4 Emergency telephone number

- Emergency Telephone: +44 (0) 1652 642124

SECTION 2 Hazards identification**2.1 Classification of the substance or mixture**

Product identification: Mixture

2.2 Label elements

- Warning



GHS09

- Hazard statements
 H303 - May be harmful if swallowed.
 H400 - Very toxic to aquatic life.
 H410 - Very toxic to aquatic life with long lasting effects.
- Precautionary statements
 P273 - Avoid release to the environment.

SECTION 3 Composition/information on ingredients

Chemical Name	CAS No.	%	Classification	Type	Hazard Statement
Calcium Sodium Borosilicate	65997-17-3	63 - 72	Not classified	(A)	None
Silver	7440-22-4	28 - 37	Not classified	(A)	None
Tin Oxide	18282-10-5	< 0.5	Not classified	(A)	None

Type - [A] Constituent [B] Impurity [C] Additive

SECTION 4 First aid measures**4.1 Most important symptoms and effects, both acute and delayed**

- May cause irritation
 Wash with mild soap and running water.
- Mildly irritating to eyes
 Flush with flowing water for at least 15 minutes and if symptoms persist, seek immediate medical attention.
- Mildly irritating to respiratory system
 (Large amounts of dust) Move victim to fresh air.
 Aid breathing.

4.2 Indication of any immediate medical attention and special treatment needed

SECTION 4 First aid measures (....)

- Treat symptomatically
 - Contact supplier for further information
 - P332+P313 - If skin irritation occurs: Get medical advice/attention.
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SECTION 5 Fire-fighting measures

5.1 Extinguishing media

- P370+P378 - In case of fire: use water, alcohol resistant foam or dry agent to extinguish.

5.2 Special hazards arising from the substance or mixture

- Not flammable. In case of fire use extinguishing media appropriate to surrounding conditions
Glass flake products are non-combustable and will not burn, Additionally, there are many chemicals that can evolve during any partial decomposition of chemical products. The amounts or identities cannot be predicted and can differ in each situation.

5.3 Advice for firefighters

Special precautions for fire-fighters:

Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters:

Glass flake products will not support combustion, but in a sustained fire, proper protection must be worn.

SECTION 6 Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Avoid inhalation of dusts.

For non-emergency personnel:

No action shall be taken involving any personal risk or without suitable training. Keep unnecessary and unprotected personnel from entering. Put on appropriate personal protective equipment.

For emergency responders:

If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in 'For non-emergency personnel'.

6.2 Environmental Precautions

- P273 - Avoid release to the environment.
- Do not allow to enter public sewers and watercourses

6.3 Methods and material for containment and cleaning up

- Dyke to prevent entry to sewer or waterway. Transfer liquid to a holding container

Small/Large spill:

Vacuum or sweep up material and place in a designated, labelled waste container. Dispose of via a licensed waste disposal contractor.

6.4 Reference to other sections

See Section 1 for emergency contact information. See Section 8.2 for information on appropriate personal protective equipment. See Section 13 for additional waste treatment information.

SECTION 7 Handling and storage

The information in this section contains generic advice and guidance. The list of 'Relevant identified uses' in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

7.1 Precautions for safe handling

Protective measures and advice general occupational information on hygiene measures:

Put on personal protective equipment (see Section 8.2). Eating, drinking and smoking should be prohibited in areas where the material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas.

7.2 Conditions for safe storage, including any incompatibilities

Store in accordance with local regulations.

SECTION 8 Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits (EU and Other):

Product/Ingredient name	Exposure limit values (8 Hour TWA reference period)
Calcium Sodium Borosilicate	EH40/2005 WELs (UK, 8/2007) 5mg/m ³

SECTION 8 Exposure controls/personal protection (...)

Silver	Belgium: TWA = 0.1mg/m ³ , Czech Republic: TWA = 0.1mg/m ³ , Ireland: TWA = 0.1mg/m ³ Spain: TWA = 0.1mg/m ³ , UK: TWA = 0.1mg/m ³ , Australia: TWA = 0.01mg/m ³ , New Zealand: TWA = 0.1mg/m ³ , Vietnam: TWA = 0.01mg/m ³ , Korea: TWA = 0.1mg/m ³ Taiwan: TWA = 0.01mg/m ³
Tin Oxide	Belgium: TWA = 2mg/m ³ (as Sn), Canada: TWA = 2mg/m ³ (as Sn) Finland: TWA = 2mg/m ³ (as Sn), Spain: TWA = 2 mg/m ³ (as Sn), Korea: TWA = 2mg/m ³
Occupational exposure limits (US only):	
Product/Ingredient name	Exposure limit values
Calcium Sodium Borosilicate	OSHA: TWA = 15mg/m ³ (total dust) TWA = 5mg/m ³ (respirable fraction) NIOSH: TWA = 3 fibers/cm ³ (fibers <3.5um in diameter & > 10um (in length) TWA = 5mg/m ³ (total dust), ACGIH TLV (8hr. TWA) 5mg/m ³ .
Silver	OSHA: TWA = 15mg/m ³ (total dust), NIOSH: TWA = 0.01mg/m ³ , ACGIH TWA = 0.01mg/m ³
Tin Oxide	NIOSH: TWA = 2mg/m ³ (as Sn)

Recommended monitoring procedures:

If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to the European Standards EN 689 for methods for the assessment of exposure by inhalation to chemical agents and national guidance documents for methods for the determination of hazardous substances.

DNELs: Not available.

PNECs: Not available.

8.2 Exposure controls**Appropriate engineering controls:**

Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits.

Individual protection measures:

Hygiene measures: Good personal hygiene and the use of barrier creams, caps, protective gloves, cotton overalls or long sleeved loose fitting clothing will maximise comfort. Appropriate techniques should be used to remove potentially contaminated clothing. Work clothing should be laundered separately from other clothing before reuse. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection: Safety glasses / goggles with side shields.

Skin/Hand protection: Use gloves to protect against physical irritation or injury if required by handling conditions. Gloves: Nitrile rubber, butyl rubber, PVC, Viton.

Body protection: Wear clean body covering clothing.

Other skin protection: Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection: If dust is generated and ventilation is inadequate, use a respirator that will protect against dust/mist.

Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Environmental exposure controls: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9 Physical and chemical properties**9.1 Information on basic physical and chemical properties**

- Appearance: Solid in the form of flakes
- Odour threshold No odour

SECTION 9 Physical and chemical properties (....)

- pH: 7-11
- Melting point/Range: >850 deg C / approx. 688 deg C (Softening point)
- Freezing point/Range: Not applicable
- Boiling Point/Range: Not available.
- Flashpoint: Closed cup: Not applicable (Product does not sustain combustion).
- Evaporation Rate: Not available
- Flammability: Not available
- Upper explosive limit Not applicable % (in air)
- Lower explosive limit Not applicable % (in air)
- Vapour Density: Not available
- Density: 2.4-2.8
- Solubility in water: Insoluble in water
- Partition Coefficient (n-Octanol/Water): Not available
- Autoignition Temperature Not available
- Viscosity: Not available
- Explosive Properties: Not available
- Oxidising Properties: Not available

9.2 Other information

No additional information.

SECTION 10 Stability and reactivity

10.1 Reactivity

No specific test data related to reactivity available for this product or its ingredients.

10.2 Chemical stability

Silver: High temperatures can cause toxic gas through evaporation.

Otherwise the product is stable.

10.3 Possibility of hazardous reactions

Under normal conditions of storage and use, hazardous reactions will not occur.

10.4 Conditions to avoid

When exposed to high temperatures, product may produce hazardous decomposition products. Refer to protective measures listed on sections 7 and 8. Silver: Avoid heat, sparks and flames etc.

10.5 Incompatible materials

None known.

10.6 Hazardous Decomposition Products

Glass flake products may release small amounts of acetic acid and other organic materials at elevated temperatures.

SECTION 11 Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Calcium Sodium Borosilicate: Not classified.

Oral - category 5 (ATEmix = 3.839.11 mg/kg bw).

Silver: Rat LD50 > 2,000mg/kg.Rat.

Tin Oxide: Rat LD50 > 2,000mg/kg.

Dermal - Silver: Rat LD50 > 2,000mg/kg.

Skin irritation/corrosion - May cause skin irritation.

Calcium Sodium Borosilicate: In skin irritation with rabbits, irritations were not observed (OECD, TG 404 GLP).

Silver: In skin irritation with rabbits, irritations were not observed (OECD, TG 404 GLP).

Tin Oxide: Not classified.

Serious eye damage/ irritation - May cause temporary irritation.

Calcium Sodium Borosilicate: In a case study on the effect of the occupational exposure with human, eye irritations were not observed.

Silver: In eyes irritations study with rabbits, irritations were not observed (OECD, TG 404 GLP).

Tin Oxide: Not classified.

Respiratory sensitisation: May cause mechanical irritation.

SECTION 11 Toxicological information (...)

Skin sensitisation

Calcium Sodium Borosilicate: In a case study of worker exposure by dermal contact, skin sensitisation was not observed.

Silver: In Buehler test on skin sensitisation with guinea pigs, skin sensitisation was not observed (EPA OPPTS 870.2600).

Tin Oxide: Not classified.

Carcinogenicity: Not classifiable as to its carcinogenicity to humans.

Mutagenicity

Calcium Sodium Borosilicate: Mutagenic reactions were not observed in-vitro (TNF-alpha test).

Silver: Negative reactions were observed in both in vitro (mammalian cell micronucleus test (GLP), mammalian cell gene mutation assay) and in vivo (micronucleus assay (OECD TG 474, GLP)).

Tin Oxide: Not classified.

Reproductive toxicity

Calcium Sodium Borosilicate: In a reproductive/developmental toxicity test, reproductive/developmental toxicity were not observed.

Silver: In development toxicity test with rats, significant development toxicity was not observed. (OECD TG 414, GLP).

Tin Oxide: Not classified

Specific target organ toxicity (single exposure)

Calcium Sodium Borosilicate and Tin Oxide - Not available.

Silver: In acute oral toxicity study with rats, no adverse effects were observed. (OECD TG 401, GLP).

Specific target organ toxicity (Repeat exposure)

Calcium Sodium Borosilicate and Tin Oxide - Not available.

Silver: In repeated dose 90-day oral toxicity study with rats, slight liver damage was observed. (NOAEL = 30mg/kg, LOAEL = 125mg/kg) (OECD TG 408, GLP).

Sensitiser

Silver - Causes of allergic contact dermatitis.

Teratogenicity: Not available.

Aspiration hazard: No aspiration hazards expected.

Information of the likely exposure routes: Not classified.

Potential acute health effects

Inhalation: Dusts from this product may cause mechanical irritation of the nose, throat and respiratory tract.

Ingestion: Although ingestion of this product is not likely to occur in industrial applications, accidental ingestion may cause illness or irritation of the mouth and gastrointestinal tract.

Potential Chronic health effects: Prolonged or repeated exposure to dust may cause pulmonary problems.

Conclusion/Summary:

There are no known health effects from the long term use or contact with non respirable glass flakes or coated glass flakes. Non respirable flakes cannot reach the deep lung because they have a diameter of greater than 3.5 nanometers. Flakes of this diameter cannot penetrate the narrow, bending passages of the human respiratory tract to reach the lower regions of the lung and thus, have no possibility of causing serious pulmonary damage. Instead, they deposit on the surfaces of the upper respiratory tract, nose or pharynx. These flakes are then cleared through normal physiological mechanisms.

Other information: Not available.

The product is not classified as dangerous.

SECTION 12 Ecological information

Chronic aquatic toxicity category 1

Acute Tox. 1

12.1 Toxicity

Fish

Silver - 96hr - LC50 = 0.0012 mg/l

Algae

Silver - 96hr - EC50 = 0.0014 mg/l

SECTION 12 Ecological information (....)

Crustacean

Silver - 96hr - LC50 = 0.0022 mg/l

12.2 Persistence and degradability

Not available.

12.3 Bioaccumulation Potential

Silver - BCF 70

12.4 Mobility in soil

Not available.

12.5 Results of PBT and vPvB assessment

- Not applicable

12.6 Other Adverse Effects

No known significant effects or critical hazards.

SECTION 13 Disposal considerations

The information in this section contains generic advice and guidance. The list of 'Relevant identified uses' in Section 1 should be consulted for any available use-specific information provided by the Exposure Scenario(s).

13.1 Waste treatment methods

Product - Methods of disposal:

The generation of waste should be avoided or minimised wherever possible. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.

Hazardous waste: The generation of waste should be avoided wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

Packaging - Methods of disposal:

The generation of waste should be avoided wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. Type of packaging: Pallet - European waste catalogue (EWC): 150102 plastic packaging, 150103 wooden packaging.

Special precautions: This material and its container must be disposed of in a safe way.

SECTION 14 Transport information

14.1 Special precautions for user

The product(s) are not considered hazardous according to national and international regulations on the transport of dangerous goods.

SECTION 15 Regulatory information

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

(GHS) COMMISSION REGULATION (EU) 2015/830

Exempt under Annex V paragraph 11 (exemptions from the Obligation to Register in Accordance with Article 2(7)(b)

Annex XIV - List of substances subject to authorisation Substances of Very High Concern. There are no Substances of Very High Concern (SVHC) in the glass flake products.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles not applicable.

(OSHA) US Federal Regulations

Toxic substances Control Act: This product contains the following chemical substances subject to the reporting requirements of TSCA 12 (B) if exported from the United States: No TSCA 12 (b) components exist in this product.

CERCLA - SARA Hazard Category: This product has been reviewed according to the EPA 'Hazard Categories' promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories: None Known.

Sara Section 313: This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendment and Reauthorization Act of 1986 and 40 CFR part 372: No Sara 313 components exist in this product.

U.S. State Regulations: New Jersey Right-to-Know: The following materials are non-hazardous, but among the top five components in this product. No NJ Right-To-Know components exist in this product.

Pennsylvania Right-To-Know: The following non-hazardous ingredients are present in the product at greater than 3%. No PA Right-To

SECTION 15 Regulatory information (....)

-Know components exist in this product.

CALIFORNIA PROPOSITION 65: No Proposition 65 Carcinogens exist in this product. No Proposition 65 Reproductive Toxins exist in this product.

International Regulations:

CANADIAN WHMIS: This SDS has been prepared in compliance with Controlled Product Regulations except for the use of the 16 headings. Canadian WHMIS Class: No WHMIS Class Assigned.

Chemical Inventory Status (CAS No. 65997-17-3):

TSCA: Listed, EINECS/ELINCS - Listed (EC No. 266-046-0), Canadian DSL - Listed, Australia AICS - Listed, Japan encls (1)-189 - Listed, Korea KIEC - Listed ECL = KE-17630, China IECSC - Listed, New Zealand NZloc - Listed, Taiwan TCSI - Listed, Philipinnes PICCS - Listed, Switzerland - Unknown, Turkey CIRS - Listed.

15.2 Chemical Safety Assessment

No Chemical Safety Assessment has been carried out.

SECTION 16 Other information

Date of revision: 22 Feb 2016
Date of issue: 12 Feb 2016
Version 2.0 (GHS & OSHA Compliant)

Note: This information is based on present scientific and technical knowledge, and is offered in good faith, but without guarantee or liability. Should further information regarding this product be required, please consult Glassflake technical services.