

SAFETY DATA SHEET

PGA POWDER

1 IDENTIFICATION OF THE SUBSTANCE AND OF THE COMPANY

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|----------------------------------|----------------------------------|-------------------------|--|
| Identification of the Substance: | Dry Beer Foam Stabiliser | Company Identification: | MURPHY & SON LTD. ALPINE STREET OLD BASFORD NOTTINGHAM NG6 0HQ ENGLAND TEL: + 44 (0)115 978 5494 FAX: + 44 (0)115 942 4431 Emergency Contact TEL: + 44 (0)1332 830736 |
| Synonyms: | PGA Propylene Glycol Alginate | | |

2 COMPOSITION/INFORMATION ON SUBSTANCE

| | |
|-----------------------|---|
| Chemical Composition: | Propylene glycol ester of alginic acid extracted from the brown algae <i>Phaeophyceae</i> |
| CAS No.: | Not applicable |
| Classification: | Not classified |
| Risk Phrases: | Not applicable |

3 HAZARD IDENTIFICATION

Contact with eyes or skin, may cause irritation

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| Eye contact: | May cause slight irritation |
| Skin contact: | May cause irritation with prolonged contact |
| Inhalation: | May cause irritation due to dust |
| Ingestion: | May be harmful if swallowed in quantity |
| Other Information: | Symptoms of exposure may include headache, nausea and vomiting |

4 FIRST AID MEASURES

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| Eye contact: | Flush eyes with copious quantities of water for at least 15 minutes. OBTAIN MEDICAL ATTENTION |
| Skin contact: | Wash affected area with copious quantities of water for at least 15 minutes. Remove all contaminated clothing and wash before re-use. Obtain medical attention if irritation persists |
| Inhalation: | Remove from exposure. In severe cases OBTAIN MEDICAL ATTENTION |
| Ingestion: | Wash out mouth with water. In severe cases OBTAIN MEDICAL ATTENTION |

5 FIRE FIGHTING MEASURES

This product is a non-flammable powder

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| Suitable Extinguishing Media: | Water, dry chemical or carbon dioxide, dependent upon surrounding fire conditions |
| Unsuitable Extinguishing Media: | None |
| Special Exposure Hazards: | None |
| Special Protective Equipment: | Not applicable |

6 ACCIDENTAL RELEASE MEASURES

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| Personal Precautions: | Wear full protective clothing - overalls, goggles, gloves, and boots |
| Environmental Precautions: | Prevent spillages from entering drains, streams, watercourses etc. If unavoidable warn the local Water Authority immediately |
| Methods for Cleaning Up: | Contain large spillages in sand or earth and shovel into marked container for safe disposal. After material pick-up is complete wash affected area well with plenty of water. Minor spillages may be washed to drain with plenty of water |

7 HANDLING & STORAGE

Handling Precautions: Wear appropriate safety equipment - goggles, gloves, boots and overalls
Storage: Store in tightly sealed containers in a cool, dry place

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits: Short Term Exposure Limit (15 mins): Not applicable
Time Weighted Average (8 hours): 4 mg/m³ for respirable dusts

Personal Protection:
Respiratory Protection: Not required for normal work procedures. If misting occurs use an appropriate respirator for mists
Hand Protection: Wear rubber or PVC gloves with gauntlets
Eye Protection: Wear chemical safety goggles
Skin Protection: Wear protective clothing with rubber boots
Other Protective Measures: An eyewash station should be nearby

9 PHYSICAL & CHEMICAL PROPERTIES

Appearance: White powder
Odour: Slight odour
pH: Not applicable
Boiling Point: Not applicable
Freezing Point: Not applicable
Flash Point: Not applicable
Flammability: Non Flammable
Autoflammability: Not applicable
Explosive Properties: None
Oxidising Properties: None
Vapour Pressure: Not applicable
Relative Density: Not applicable
Solubility: Soluble in water

10 STABILITY & REACTIVITY

Stability: When stored unopened in cool (max 20°C) dry conditions, the maximum storage time before re-assay is 12 months
Conditions to Avoid: High temperatures (above 35°C)
Materials to Avoid:
Hazardous Decomposition Products: Not applicable

11 TOXICOLOGICAL INFORMATION

Toxicological Data: No data
Effects of exposure:
Eye contact: Irritation. No permanent damage expected if treated immediately
Skin contact: Minor irritation may occur from prolonged contact
Ingestion: May cause nausea and vomiting
Inhalation: May cause coughing and wheezing
Carcinogenicity: This material is not considered to be a carcinogen
Mutagenicity: This material is not considered to be a mutagen
Reproductive Effects: None identified

12 ECOLOGICAL INFORMATION

Environmental Effect: No Data
Ecotoxicity Value: No Data
Persistence & Degradability: No data.
Bioaccumulative Potential: Not known

13 DISPOSAL CONSIDERATIONS

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| Disposal of Product: | Absorb in sand or earth and dispose of in an approved land fill. Minor spillages may be washed to drain with plenty of water |
| Disposal of Packaging: | This product is supplied in returnable packaging |
| National or Regional Legislation: | Dispose of in accordance with Part 2 of the Environmental Protection Act, 1990. Consult your local Waste Regulatory Authority if in any doubt |

14 TRANSPORT INFORMATION

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|---------------------------------|----------------|
| UN No.: | Not applicable |
| Classification: | Not classified |
| Packing Group: | Not applicable |
| Transport Hazard Symbol: | Not applicable |

15 REGULATORY INFORMATION

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|--------------------------|---------------------------|
| Classification: | Not classified |
| Hazard Pictogram: | Not applicable |
| Risk Phrases: | Not applicable |
| Safety Phrases: | S22 - Do not breathe dust |

National Legislation:

The Control of Substances Hazardous to Health Regulations 1999
EH40 Occupational Exposure Limits
Chemicals (Hazard Information and Packaging for Supply) (Amendment) Regulations 1996 (CHIP 96) Amended 1998
Carriage of Dangerous Goods by Road and Rail (Classification, Packaging and Labelling) Regulations 1996
Carriage of Dangerous Goods by Road Regulations 1996

16 OTHER INFORMATION

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| Recommended Uses: | Customers should ensure that the product is entirely suitable for their own purpose |
| Further Information: | Advice and literature on the properties, storage and handling of this product are available on request |
| EEC Directive: | The above information complies with the Directive 93/112/EEC |

The information contained in this data sheet has been compiled by Murphy & Son Ltd. to the best of its own knowledge and of available, reliable data.

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PGA SOLUTION**1 DESCRIPTION**

PGA Solution is a solution of PGA Powder, a specially prepared food grade propylene glycol alginate derived from brown seaweed. It is used as a beer and cider foam stabiliser.

- ◆ Protects beer foam against contaminants at dispense e.g. dirty glasses
- ◆ Enhances foam stability of beers with a naturally high level of foam inhibitors
- ◆ Improves foam cling to side of glass
- ◆ Improves measured head retention value in beers

Propylene glycol alginate is a molecule possessing both hydrophilic and hydrophobic portions, thus modifying bubble wall characteristics. PGA concentrates at the surface of the bubble with the hydrophobic end interacting with gas molecules inside and outside the bubble and the hydrophilic part in contact with water molecules in the liquid forming the bubble wall. There is less attraction between the hydrophobic groups than there is between the water molecules in which the PGA is dissolved, so the surface tension at the bubble surface is reduced, stabilising the foam structure.

2 STORAGE AND SHELF LIFE

- Store in cool conditions, away from direct sunlight
- Maximum storage temperature - 20°C
- Recommended storage temperature - 5 to 15°C
- Minimum storage temperature - 1°C
- Do not allow the product to freeze
- The shelf life at the recommended storage temperature is 8 weeks from date of manufacture

3 PACKAGING

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| 25 litre Drum | 200 litre Drum | 1000 litre IBC |
|------------------|-------------------|-------------------|

4 USING THE PRODUCT**(a) How much of the product to add**

Additions to beer of 0.2 litres/hl of PGA Solution will give ensure retention of beer head. To enhance the beer head, use a rate of 0.4 litres/hl. The maximum recommended addition of PGA Solution is 0.5 litres/hl.

Where to add the product

PGA Solution should be added to beer after final filtration and not in combination with any other additions.

5 GUIDELINES FOR USE

DO

- Check that the product is within its shelf life before use
- Remember that PGA solutions are temperature sensitive
- Carry out optimisation trials to determine the correct rate of use

DO NOT

- Add solutions of PGA in combination with any other products

6 TECHNICAL SUPPORT

For Health & Safety information on this product, please see the Materials Safety Data Sheet (MSDS)

For support and advice on the use of this product, please call or e-mail our Technical Administrator:-

Telephone:- + 44 (0)115 978 5494

E-Mail:- laboratory@murphyandson.co.uk

7 SPECIFICATION

| | | |
|---------------------------------------|---|--|
| Composition | A solution of propylene glycol alginate and sodium metabisulphite | |
| Appearance | A clear colourless liquid | |
| Odour | Sulphur dioxide (SO ₂) | |
| | | |
| Specific Gravity (20°C) | 1.0075 ± 0.0015 | |
| Total Solids | 1.9-2.3% w/v | |
| Esterified Carboxyl Groups (dry %w/w) | > 80% | |
| | | |
| <u>Analysis</u> | | |
| Sulphur dioxide (ppm) | 500 ± 50 * | |
| pH | 3.95 ± 0.45 | |
| Haze (EBC) | < 5.0 | |
| | | |
| <u>Microbiological</u> | | |
| Total Plate Count (cfu/ml) | < 100 | |
| Yeast and Moulds (cfu/ml) | < 100 | |
| E. coli | Absent in 1ml | |
| Salmonella | Absent in 25ml | |
| | | |
| <u>Maximum Limits of Impurities</u> | | |
| As (ppm) | 3 | |
| Pb (ppm) | 10 | |
| Heavy Metals as Pb (ppm) | 40 | |
| TCA (Trichloroanisole) | <0.05ppb | |

* *The sulphur dioxide specification is that at the time of manufacture. Because of its volatile nature, the level at delivery may be less than this figure*

This product is classed as acceptable for use in food by the MAFF document 'Report on the Review of Additives and Processing Aids used in the Production of Beer' (FAC/REP/26)

Sulphur dioxide and sulphites at concentrations of more than 10 mg/kg or 10 mg/litre expressed as SO₂ must be labelled as allergenic (*European Directive (2003/89/EC)*).

8 REFERENCE

| | |
|---------------|--------------|
| Product | PGA Solution |
| Authorised by | C.J. Fleming |
| Issue No. | 1.0 |

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| Product Code | PGAS |
| Formulation | 5000 |
| Date | 17/05/12 |