File No PLC/1522

**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)**

**POLYMER OF LOW CONCERN PUBLIC REPORT**

**Alkyl methacrylate and alkyl acrylate co-polymer**

This Assessment has been compiled in accordance with the provisions of the *Industrial Chemicals (Notification and Assessment) Act 1989* (the Act) and Regulations. The National Industrial Chemicals Notification and Assessment Scheme (NICNAS) is administered by the Australian Government Department of Health, and conducts the risk assessment for public health and occupational health and safety. The assessment of environmental risk is conducted by the Australian Government Department of the Environment and Energy.

This Public Report is available for viewing and downloading from the NICNAS website or available on request, free of charge, by contacting NICNAS. For requests and enquiries please contact the NICNAS Administration Coordinator at:


| | |
|---|---|
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**Director**
**NICNAS**


December 2018

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## SUMMARY

The following details will be published in the NICNAS *Chemical Gazette:*

| ASSESSMENT REFERENCE | APPLICANT | CHEMICAL OR TRADE NAME | HAZARDOUS SUBSTANCE | INTRODUCTION VOLUME | USE |
|---|---|---|---|---|---|
| PLC/1522 | Nagase Singapore (Pte) Ltd | Alkyl methacrylate and alkyl acrylate co-polymer | No | ≤ 5 tonnes per annum | Plastic additive |

## CONCLUSIONS AND REGULATORY OBLIGATIONS

**Human Health Risk Assessment**
Based on the assumed low hazard and the assessed use pattern, the notified polymer is not considered to pose an unreasonable risk to the health of workers and the public.

**Environmental Risk Assessment**
Based on the assumed low hazard and the assessed use pattern, the notified polymer is not considered to pose an unreasonable risk to the environment.

**Health and Safety Recommendations**

- No specific engineering controls, work practices or personal protective equipment are required for the safe use of the notified polymer itself, however, these should be selected on the basis of all ingredients in the formulation, noting that the formulation may be classified because of hazardous impurities.

  Guidance in selection of personal protective equipment can be obtained from Australian, Australian/New Zealand or other approved standards.

- A copy of the SDS should be easily accessible to employees.

- If products and mixtures containing the notified polymer are classified as hazardous to health in accordance with the *Globally Harmonised System of Classification and Labelling of Chemicals (GHS),* as adopted for industrial chemicals in Australia, workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation should be in operation.

**Disposal**

- Where reuse or recycling are not appropriate, dispose of the notified polymer in an environmentally sound manner in accordance with relevant Commonwealth, state, territory and local government legislation.

**Emergency Procedures**

- Spills and/or accidental release of the notified polymer should be handled by physical containment, collection and subsequent safe disposal.

**Secondary Notification**
This risk assessment is based on the information available at the time of notification. The Director may call for the reassessment of the polymer under secondary notification provisions based on changes in certain circumstances. Under Section 64 of the *Industrial Chemicals (Notification and Assessment) Act (1989)* the notifier, as well as any other importer or manufacturer of the notified polymer, have post-assessment regulatory obligations to notify NICNAS when any of these

circumstances change. These obligations apply even when the notified polymer is listed on the Australian Inventory of Chemical Substances (AICS).

Therefore, the Director of NICNAS must be notified in writing within 28 days by the notifier, other importer or manufacturer:

(1) Under Section 64(1) of the Act; if
- the notified polymer is introduced in a chemical form that does not meet the PLC criteria;
- the notified polymer is intended for use in direct food contact;

or

(2) Under Section 64(2) of the Act; if
- the function or use of the notified polymer has changed from a plastic additive, or is likely to change significantly;
- the amount of notified polymer being introduced has increased, or is likely to increase, significantly;
- the notified polymer has begun to be manufactured in Australia;
- additional information has become available to the person as to an adverse effect of the notified polymer on occupational health and safety, public health, or the environment.

The Director will then decide whether a reassessment (i.e. a secondary notification and assessment) is required.

**Safety Data Sheet**

The SDS of the notified polymer was provided by the applicant. The accuracy of the information on the SDS remains the responsibility of the applicant.

# ASSESSMENT DETAILS

## 1. APPLICANT AND NOTIFICATION DETAILS

**Applicants**
Nagase Singapore (Pte) Ltd (ABN: 61 147 178 292)
Suite 8, Level 1, 2 Brandon Park Drive
WHLEERES HILL VIC 3150

**Exempt Information (Section 75 of the Act)**
Data items and details claimed exempt from publication: chemical name, CAS number, molecular and structural formulae, molecular weight, polymer constituents, residual monomers/impurities, use details and import volume.

## 2. IDENTITY OF POLYMER

**Marketing Name**
Alkyl methacrylate and alkyl acrylate co-polymer

**Molecular Weight**
Number Average Molecular Weight (Mn) is > 10,000 g/mol

## 3. PLC CRITERIA JUSTIFICATION

| *Criterion* | *Criterion met* |
|---|---|
| Molecular Weight Requirements | Yes |
| Functional Group Equivalent Weight (FGEW) Requirements | Yes |
| Low Charge Density | Yes |
| Approved Elements Only | Yes |
| Stable Under Normal Conditions of Use | Yes |
| Not Water Absorbing | Yes |
| Not a Hazard Substance or Dangerous Good | Yes |

The notified polymer meets the PLC criteria.

## 4. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| Appearance at 20 °C and 101.3 kPa | White powder |
| Melting Point/Glass Transition Temperature | Not determined. Decomposition occurs at > 230 °C |
| Density | ~ 1,200 kg/m$^3$ at 20 °C |
| Water Solubility | Insoluble |
| Particle size | < 38 µm = 1.48%<br>< 106 µm = 17.49% |
| Reactivity | Stable under normal environmental conditions |
| Degradation Products | None under normal conditions of use |

## 5. INTRODUCTION AND USE INFORMATION

**Maximum Introduction Volume of Notified Chemical (100%) Over Next 5 Years**

| *Year* | *1* | *2* | *3* | *4* | *5* |
|---|---|---|---|---|---|
| Tonnes | ≤ 5 | ≤ 5 | ≤ 5 | ≤ 5 | ≤ 5 |

**Use**
The notified polymer will not be manufactured in Australia. The notified polymer will be imported as a blend in powder form at ≤ 50% concentration. The blend will be mixed with other resins and additives and extruded into solid, plastic pellets containing the notified polymer at < 1% concentration followed by moulding into plastic articles.

The notified polymer will not be used in the manufacture of plastics intended for direct food contact.

## 6. HUMAN HEALTH RISK ASSESSMENT

No toxicological data were submitted. The notified polymer meets the PLC criteria and is therefore assumed to be of low hazard. The risk of the notified polymer to occupational and public health is not considered to be unreasonable given the assumed low hazard and the assessed use pattern.

The notified polymer is water-insoluble with a high molecular weight (> 70,000 g/mol). Inhalation of polymers with molecular weights > 70,000 g/mol has been linked with irreversible lung damage due to lung overloading and impaired clearance of particles from the lung, particularly following repeated exposure (US EPA, https://www.epa.gov/reviewing-new-chemicals-under-toxic-substances-control-act-tsca/high-molecular-weight-polymers-new, accessed on 23 October 2018). However, the notified polymer only contains a small percentage (< 1.48%) of respirable particles (< 10 μm). If the notified polymer is inhaled at low levels and/or infrequently, it is assumed that it will be cleared from the lungs. Therefore lung overloading effects are not expected.

NICNAS notes that the notified polymer contains residual monomers that are classified as hazardous according to the Globally Harmonised System of Classification and Labelling of Chemicals (GHS), as adopted for industrial chemicals in Australia. These are not present in the notified polymer as introduced above the cut off concentrations for classification.

## 7. ENVIRONMENTAL RISK ASSESSMENT

No ecotoxicological data were submitted. Polymers without significant ionic functionality are generally of low concern to the environment (Boethling & Nabholz, 1997).

The notified polymer will be imported as a component of a blend. The blend will be mixed with other ingredients and extruded into beads followed by moulding into plastic articles. Spills during this process, estimated by the notifier to contain up to 1% of the import volume of the notified polymer, will be collected using an industrial vacuum cleaner and disposed of to landfill in accordance with local government regulations. Dust released will be collected on exhaust filters and disposed of to landfill. Once the beads are formed, the notified polymer will be trapped within the solid polymer matrix. Accidental spills of the products containing the notified polymer during import, storage and transport are expected to be collected for disposal, in accordance with local government regulations.

During the manufacture of the injection and extrusion moulded articles, excess moulded material, estimated by the notifier to contain up to 3% of the import volume of the notified polymer, will be trimmed and recycled. Unused materials and spills during this process will also be collected for recycling. Release of the notified polymer from the cleaning of the extruder is estimated to be < 0.2% per annum which is expected to be collected for recycling or disposal, in accordance with local government regulations. Residual notified polymer in empty packages, estimated by the notifier to contain up to 0.1% of its import volume, will be disposed of to landfill, in accordance with local government regulations.

Used plastic articles containing the notified polymer may enter recycling streams, but they will ultimately end up in landfill at the end of their useful lives. In landfill, the notified polymer will be bound within a polymer matrix and will be neither bioavailable nor mobile. Thus, release of the notified polymer from the assessed use pattern is not expected to lead to ecotoxicologically significant

concentrations in the aquatic environment. The notified polymer is not expected to bioaccumulate due to its high molecular weight and insolubility in water. The notified polymer in landfill is expected to eventually degrade via biotic and abiotic processes to form water and oxides of carbon.

Therefore, based on its assumed low hazard and reported use pattern, the notified polymer is not considered to pose an unreasonable risk to the environment.

## BIBLIOGRAPHY

Boethling, RS & Nabholz VJ (1997) Chapter 10 Environmental Assessment of Polymers under the U.S. Toxic Substances Control Act. In: Hamilton, JD Sutcliffe R ed. Ecological Assessment of Polymers Strategies for Product Stewardship and Regulatory Programs, 1st ed. New York, Van Nostrand Reinhold, pp 187-234.