

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

### POLYMER OF LOW CONCERN PUBLIC REPORT

#### TAKAPS 4G S

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**

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## SUMMARY

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

ASSESSMENT REFERENCE	APPLICANT(S)	CHEMICAL OR TRADE NAME	HAZARDOUS SUBSTANCE	INTRODUCTION VOLUME	USE
PLC/1529	Takasago International (Singapore) Pte Ltd	TAKAPS 4G S	No	≤ 1 tonne per annum	Component of microcapsule for fragrances

## 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.

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**

- Prevent from entering into soil, ditches, sewers, waterways and/or groundwater.
- 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.or
- (2) Under Section 64(2) of the Act; if
  - the function or use of the notified polymer has changed from component of microcapsule for fragrances, 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

Takasago International (Singapore) Pte Ltd (ABN: 29 099 666 832)  
Unit 12, 82 – 86 Pacific Highway  
ST LEONARDS NSW 2065

#### Exempt Information (Section 75 of the Act)

Data items and details exempt from publication include: chemical name, other names, CAS number, molecular and structural formulae, molecular weight, polymer constituents, residual monomers/impurities and use details.

### 2. IDENTITY OF POLYMER

#### Marketing Name

TAKAPS 4G S

#### Molecular Weight

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

### 3. PLC CRITERIA JUSTIFICATION

<i>Criterion</i>	<i>Criterion met</i>
Molecular Weight Requirements	Yes
Functional Group Equivalent Weight (FGEW) Requirements	Not applicable
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	Decomposes above 200 °C
Density	1,220 kg/m <sup>3</sup> *
Water Solubility	Not Determined. Expected to be insoluble based on its high molecular weight and degree of crosslinking with mainly hydrophobic functionality.
Dissociation Constant	Not Determined. Contains anionic functionality expected to dissociate in the environmental pH range 4 – 9.
Particle Size **	D <sub>10</sub> = 21.4 – 29.5 µm D <sub>50</sub> = 28.9 – 41.4 µm D <sub>90</sub> = 38.5 – 56.3 µm
Reactivity	Stable under normal environmental conditions
Degradation Products	None under normal conditions of use
* Density was estimated by sedimentation observations that compared the relative density of the dispersion solvent (and other ingredients) to the notified polymer	

\*\* Determined using a laser diffraction/scattering particle size distribution analyser and a range of different fragrance capsule slurry samples. The amount of fine particulates present will be minimised by washing the beads as part of their production process

## 5. INTRODUCTION AND USE INFORMATION

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

<i>Year</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
Tonnes	0.5	0.7	0.9	1	1

### Use

#### Introduction

The notified polymer will not be manufactured in Australia. The notified polymer will be imported as a component of fragrance capsule slurry in intermediate bulk containers (IBC) or ISO intermodal containers or as a component of finished consumer products.

#### Reformulation

At the end use product manufacturing site, the fragrance capsule slurry (containing the notified polymer at concentrations of  $\leq 10\%$ ), will be manually weighed or metered directly from the storage containers into a blending tank and mixed with other ingredients to form the finished consumer products (containing the notified polymer at concentrations of  $< 0.5\%$ ).

The products may be reformulated in batch mixers, where addition of the notified polymer is semi-automated. The finished consumer products may be present in liquid or a solid form.

#### End Use

The notified polymer is a microcapsule that encapsulates fragrance ingredients. The notified polymer at concentrations of  $< 0.5\%$  will be used in laundry products and personal care products.

## 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 microcapsule is intended for use in laundry products and personal care products at concentrations of  $< 0.5\%$ , thus direct exposure of the public to the notified polymer will occur only at low levels. Inhalation exposure to the notified polymer is not expected.

Therefore, 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.

## 7. ENVIRONMENTAL RISK ASSESSMENT

No ecotoxicological data were submitted. Anionic polymers are generally of low toxicity to fish and daphnia, however they are known to be moderately toxic to algae. The mode of toxic action is over-chelation of nutrient elements needed by algae for growth. The highest toxicity is when the acid is on alternating carbons of the polymer backbone. The notified polymer contains functionality that dilutes the chelating effect, which results in significantly reduced toxicity to algae (Boethling & Nahbolz, 1997).

The notified polymer will not be manufactured in Australia. The notified polymer is a microcapsule that encapsulates fragrance ingredients and will be imported as a component of fragrance capsule

slurry. The microcapsules slurry will be mixed and blended with other ingredients manually or semi-automatically to form the finished personal care or laundry products.

During reformulation, the notifier estimates that 1% of the total importation volume of the notified polymer may be lost due to spills that will be readily contained and collected for disposal to landfill. Additionally, 1% of the total import volume of the notified polymer is anticipated to remain in storage containers as residues and will be disposed of to landfill. In landfill, the notified polymer is not expected to be readily biodegradable and over time it is expected to degrade, ultimately forming water and oxides of carbon and silicon.

Reformulation equipment will typically be cleaned with soap and water and the notifier predicts that less than 1% of the annual importation volume of the notified polymer will be lost through washing. These washings will be stored in holding tanks on-site for disposal by licensed waste contractors.

The notified polymer is insoluble in water. It contains hydrolysable functionalities, but is not expected to significantly hydrolyse in the environmental pH range (4 – 9). The majority of the notified polymer is expected to be released to sewer during use in laundry detergents and personal care products. Assuming 0% of the notified polymer will be removed via absorption to sludge in the sewage treatment plant, the resultant predicted environmental concentration (PEC) in sewage effluent on a nationwide basis is estimated as 0.56 µg/L [ $PEC_{\text{river}} = 2.74 \text{ kg notified polymer/day} \div (200 \text{ L/person/day} \times 24.386 \text{ million people}) \times 1 \text{ (dilution factor)}$ ]. The notified polymer is not expected to bioaccumulate due to its high molecular weight (NAMW > 10,000 g/mol) and it is not expected to occur in surface waters at ecotoxicologically significant concentrations.

Therefore, based on its assumed low hazard, and assessed used 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