

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

POLYMER OF LOW CONCERN PUBLIC REPORT

PE-100

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**

July 2017

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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/1406	Kao Australia Pty Ltd	PE-100	No	< 300 tonnes per annum	A component of toner

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.

- Service personnel should wear disposable gloves and ensure adequate ventilation is present when removing spent printer cartridges containing the notified polymer and during routine maintenance and repairs.
- 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.or
- (2) Under Section 64(2) of the Act; if
 - the function or use of the notified polymer has changed from a component of toner, 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 products containing 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

Kao Australia Pty Ltd (ABN: 059 054 708 299)
Level 1, 19-23 Prospect Street
BOX HILL VIC 3128

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(s)

PE-100 (containing the notified polymer at 90-95%)

Molecular Weight

Number Average Molecular Weight (Mn) is > 1,000 Da

3. PLC CRITERIA JUSTIFICATION

<i>Criterion</i>	<i>Criterion met</i>
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	Brown powder
Melting Point/Glass Transition Temp	90-120 °C
Density	1.15-1.25 kg/m ³ at 20°C
Water Solubility	Not determined. Expected to be low based on the high molecular weight and predominantly hydrophobic structure of the notified polymer.
Particle Size	Not determined
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

<i>Year</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
Tonnes	< 300	< 300	< 300	< 300	< 300

Use

The notified polymer will not be manufactured, reformulated or repackaged in Australia. It will be imported into Australia in sealed cartridges or bottles, as a component in toner for electrophotography.

6. HUMAN HEALTH RISK ASSESSMENT

No toxicological data were submitted. The notified polymer is an insoluble powder; however, it will be imported in a sealed cartridges or bottles and there will be no reformulation or repackaging in Australia. Therefore, significant exposure and the risk of lung overloading is not expected. In addition, 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.

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, which may apply to the notified polymer. However, the toxicity to algae is likely to be reduced due to the presence of calcium ions in environmental waters, which will bind to the functional groups.

The notified polymer will be imported into Australia as a component of printing toner in sealed cartridges, or developer in plastic bottles, which will be distributed to commercial facilities for printing onto paper substrates. Spills or accidental leaks of the product containing the notified polymer are expected to be vacuum collected and disposed of to landfill. It is assumed that 50% of the printed paper will end up in landfill, and the rest will undergo paper recycling processes.

During recycling processes, waste paper is repulped using a variety of chemical agents which, amongst other things, enhance detachment of inks from the fibres. Waste water containing the notified polymer will be released to sewer; during the de-inking process, the cured ink containing the notified polymer is unlikely to be released into supernatant waters based on its low solubility in water. Based on its high molecular weight and anionic properties, up to 50% of the notified polymer is expected to adsorb to sludge and sediment during sewage treatment plant (STP) processes (Boethling and Nabholz, 1997), with sludge eventually disposed of to landfill or re-used for soil remediation. Under a worst case scenario, it is assumed that all of the notified polymer bound to printed paper will enter sewers during recycling processes (i.e. 50% of the import volume), with no removal during STP processes. The resultant predicted environmental concentration (PEC) in sewage effluent on a nationwide basis over 260 working days per year is estimated at 127.56 µg/L. This PEC is below the EC50 for algae of the most toxic anionic polymers (EC50 > 1 mg/L). Based on its high molecular weight, the notified polymer is not expected to cross biological membranes, and is therefore unlikely to bioaccumulate.

It is estimated that 25 kg of notified polymer may be released from spills. Residuals in the imported plastic bottles are expected to contain up to 0.5% of the notified polymer (maximum of 25 kg of notified polymer annually). All wastes, including container residues, accidental spill waste, and sludge waste from paper recycling, are expected to be disposed of to landfill. The notified polymer is not expected to be readily biodegradable given it is not expected to be soluble in water. In landfill, the notified polymer is expected to eventually degrade by biotic and abiotic processes to form water and oxides of carbon.

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

8. BIBLIOGRAPHY

Boethling, R.S. and Nabholz, J.V. (1997). Environmental assessment of polymers under the U.S. Toxic Substances Control Act, Chapter 10. pp 187-234 in Hamilton, J.D. and Sutcliffe, R. (editors), Ecological Assessment of Polymers: Strategies for Product Stewardship and Regulatory Programs. Van Nostrand Reinhold, New York.