File No PLC/1453

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

POLYMER OF LOW CONCERN PUBLIC REPORT

PUG542

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:

Street Address:	Level 7, 260 Elizabeth Street, SURRY HILLS NSW 2010, AUSTRALIA.
Postal Address:	GPO Box 58, SYDNEY NSW 2001, AUSTRALIA.
TEL:	+ 61 2 8577 8800
FAX:	+ 61 2 8577 8888
Website:	www.nicnas.gov.au

Director
NICNAS

October 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/1453	HP PPS Australia Pty Ltd	PUG542	No	≤ 30 tonnes per annum	Component of industrial inkjet printing ink

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.

- If aerosols are formed during the use of the notified polymer, engineering controls and respiratory protection should be used to prevent inhalation exposure.

- 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 to be used in printing on food packaging materials;

or

(2) Under Section 64(2) of the Act; if
- the function or use of the notified polymer has changed from a component of industrial inkjet printing ink, 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 a product 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
HP PPS Australia Pty Ltd (ABN: 16 603 480 628)
Level 5, 1 Homebush Bay Drive
RHODES NSW 2138

Exempt Information (Section 75 of the Act)
Data items and details claimed exempt from publication: chemical name, other name(s), 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)
PUG542

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 solid
Melting Point/Glass Transition Temp	Not determined. Introduced in water-based inks
Density	Not determined. Introduced in water-based inks
Water Solubility	> 2 g/L at 40 °C (after 2 weeks)
Dissociation Constant	Not determined. Contains potential cationic functionalities and is likely to be ionised in the environmental pH range (4 - 9).
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	1-5	1-5	5-10	10-20	20-30

Use
The notified polymer will not be manufactured or reformulated in Australia. It will be imported as a component of finished printing ink at ≤ 5% concentration for use in industrial inkjet printing presses to print on cardboard and corrugated paper. Printing ink containing the notified polymer will not be made available to the general public and will not be used for printing on materials with 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.

Although not considered in this risk assessment, 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.

7. ENVIRONMENTAL RISK ASSESSMENT

No ecotoxicological data were submitted for the notified polymer. The notified polymer contains potentially cationic functionalities, however the functional group equivalent weight (FGEW) of the notified polymer is higher than 5,000 Da, therefore the notified polymer is not expected to be of concern to the aquatic environment.

The notified polymer will be imported as a component of finished aqueous ink product for use in industrial inkjet printing presses to print on cardboard and corrugated paper. Spills or accidental leaks of the ink containing the notified polymer during import, transport, storage and use, are expected to be collected using a suitable adsorbent and be disposed of to landfill in accordance with local regulations.

Most of the notified polymer is expected to share the fate of the paper on which it is applied to and will be either disposed of to landfill or subject for paper recycling. According to the most recent Australian paper recycling rate (APC, 2015), 76% of waste paper containing the notified polymer is expected to be recycled domestically, and the remaining 24% is assumed to end up in landfill. The notified polymer disposed of to landfill along with used paper is not expected to be mobile, based on its potential cationic properties and high molecular weight. During recycling processes, waste paper is repulped using a variety of chemical agents, which, amongst other things, enhance detachment of inks and coatings from the fibres. The notified polymer discharged to wastewater from paper recycling processes is expected to be efficiently removed through adsorption of the potential cationic polymer to sludge or by flocculation at sewage treatment plants (STPs) (Boethling and Nabholz, 1997).

According to the Australian paper recycling rate (APC, 2015), 76% of the total annual import volume of the notified polymer applied to paper is expected to be recycled and be potentially released to sewers. The notified polymer is a potential cationic polymer with molecular weight > 10,000 Da and therefore more than 90% of the notified polymer is expected to be removed by partition to sludge at STPs (Boethling and Nabholz, 1997). As paper recycling is to be processed at facilities located throughout Australia, it is anticipated that such releases will occur over 260 working days per annum into the Australian effluent volume. As a result, the Predicted Environmental Concentration (PEC) in sewage effluent on a nationwide basis is not expected to lead to ecotoxicologically significant concentrations of the notified polymer in surface waters.

Sludge containing the notified polymer from STPs will be sent to landfill for disposal or agricultural land for remediation. The notified polymer will bind to soil or sludge due to its potential cationic functionalities and is not expected to be mobile in the environment (Boethling and Nabholz, 1997). In landfill, soil and water, the notified polymer is expected to be degraded by biotic and abiotic processes, eventually forming water and oxides of carbon and nitrogen.

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.

BIBLIOGRAPHY

APC (Australian Packaging Covenant) 2015 Recycling Data Report 2014-2015: Paper Packaging, Glass Containers, Steel Cans and Aluminium Packaging, http://www.packagingcovenant.org.au/pages/apc-recycling-data.html.

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.