

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

**POLYMER OF LOW CONCERN FULL PUBLIC REPORT**

**Polymer in AQUA JET Yellow**

This Assessment has been compiled in accordance with the provisions of the *Industrial Chemicals (Notification and Assessment) Act 1989* (Cwlth) (the Act) and Regulations. The National Industrial Chemicals Notification and Assessment Scheme (NICNAS) is administered by the Australian Government Department of Health and Ageing, 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 Sustainability, Environment, Water, Population and Communities.

For the purposes of subsection 78(1) of the Act, this Full Public Report may be inspected at our NICNAS office by appointment only at Level 7, 260 Elizabeth Street, Surry Hills NSW 2010.

This Full Public Report is also 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**

May 2011

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## 1. APPLICANT AND NOTIFICATION DETAILS

### Applicants

Toyo Ink Australia Pty Ltd (ABN 29 006 294 837)  
29 Garden Street  
Kilsyth VIC 3137

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

Data items and details claimed exempt from publication: chemical name, other names, 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)

Polymer in AQUA JET Yellow

### Molecular Weight

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

### Reactive Functional Groups

The notified polymer contains only low concern functional groups.

## 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:	Semi-transparent liquid*
Melting Point/Glass Transition Temp	N/A
Density	1.02 kg/m <sup>3</sup> *
Water Solubility	330-430 g/L at room temperature. Notified polymer (10 g) was added into different volumes of water (23-90 mL) in flasks. After 24 h shaking, supernatant solutions were filtered. The water solubility was determined from the appearance of filtrate and residues on the filter.
Dissociation Constant	Not determined. The notified polymer is a salt and is expected to be ionised under environmental conditions.
Reactivity	Stable under normal environmental conditions
Degradation Products	None under normal conditions of use
*Aqueous Formulation- concentration unspecified.	

## 5. INTRODUCTION AND USE INFORMATION

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

The notified polymer will be imported as a finished ink formulation at a concentration of up to 40%. Typically the packaging of the inks will be 18 kg metal cans, 1 L plastic bottle or 1 L aluminum pouch in plastic outer cartridge.

<i>Year</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
Tonnes	1-10	10-30	10-30	20-50	20-50

### Use

The notified polymer will not be manufactured or reformulated in Australia. It will be imported into Australia in finished products of printing inkjet inks at up to 40% concentration.

The notified polymer will be used as a component of inkjet printing ink at up to 40% concentration for commercial use only.

## 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.

## 7. ENVIRONMENTAL RISK ASSESSMENT

No ecotoxicological data were submitted. Anionic polymers 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 occur to some extent in the notified polymer's back bone.

There will be no local manufacture or re-formulation of the notified polymer, and therefore, no release of the notified polymer to the environment is expected from these processes. Accidental spills are expected to be contained and disposed of to landfill.

The ink will be used for commercial printing on a variety of substrates including paper. Notified polymer bound within the dried ink matrix will share the fate of the printed article. It is anticipated that approximately half of these articles will be disposed of to landfill and the remainder will be recycled at the end of their useful lifetime. During the recycling process, waste paper articles will be 'repulped' using a variety of alkaline dispersing and wetting agents, water emulsifiable organic solvents and bleaches. Aqueous wastes containing these agents are expected to be sent to the municipal sewage treatment plants (STPs) for processing. Due to the notified polymer's water solubility, some release of it to the water column is expected. Based on 50% of the notified polymer being released to the sewer and the water consumption of the Australian population, calculations indicate that the predicted environmental concentration, at worst, will be a maximum of 22.7 µg/L on a nationwide basis [25 tonnes/(21.16 million people × 200 L per person per day × 260 days)]. Toxicity to algae from nutrient over-chelation is not expected to any ecotoxicologically significant extent due to a limited proportion of alternating acids on the notified polymer's carbon backbone, and the presence of calcium ions in the water that bind with chelating functional groups to further reduce toxicity. Due to its high molecular weight, the notified polymer will not readily cross biological membranes, and a low potential for bioaccumulation is predicted. Notified polymer adsorbed to STP sludge will be disposed of to landfill or may be used for soil remediation, where it is expected to slowly degrade to form water and oxides of carbon.

The notified polymer is not expected to pose an unreasonable risk to the environment based on its assumed low toxicity to aquatic organisms and the low potential for aquatic exposure resulting from its use as a component of ink in commercial digital printing.

## **8. RECOMMENDATIONS**

### **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 cotton or 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 MSDS should be easily accessible to employees.
- If products and mixtures containing the notified polymer are classified as hazardous to health in accordance with the *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008(2004)], workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation must be in operation.

### **Environmental Recommendations**

- No specific control measures are required to minimise release of the notified polymer to the environment.

### **Disposal**

- The notified polymer should be disposed to landfill.

### **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 component of ink for commercial printing, 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 chemical 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.

**Material Safety Data Sheet**

The MSDS of the product containing the notified polymer was provided by the applicant. The accuracy of the information on the MSDS remains the responsibility of the applicant.