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

**FULL PUBLIC REPORT**

**Polymer in E-01**

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**Director  
NICNAS**

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**FULL PUBLIC REPORT****Polymer in E-01****1. APPLICANT AND NOTIFICATION DETAILS**

## APPLICANT(S)

JohnsonDiversey Australia Pty.Ltd  
 29 Chifley Street  
 SMITHFIELD NSW 2164 Australia  
 ABN 9000 065 725

## NOTIFICATION CATEGORY

Self Assessment: Polymer of Low Concern

## 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

## PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

None

## NOTIFICATION IN OTHER COUNTRIES

This polymer has been notified on the Canadian DSL and Korean ECL and US TSCA inventory as a new chemical by Johnson Polymer a Division of JohnsonDiversey

**2. IDENTITY OF CHEMICAL**

## MARKETING NAME(S)

Polymer in E-01

## MOLECULAR WEIGHT (MW)

Number Average Molecular Weight (Mn) >1000

## 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	N/A
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

<b>Appearance at 20°C and 101.3 kPa</b>	Clear, slightly yellow liquid (Product E-01)
<b>Melting Point/Glass Transition Temp</b>	Tg: 88°C (Measurement of dry polymer)
<b>Density</b>	1098 kg/m <sup>3</sup> at 25°C (product E-01)
<b>Water Solubility</b>	Ceiling value of 1.3 g/L at 20°C measurements made on dried polymer resin.
<b>Dissociation Constant</b>	pKa=4.88 (estimated to be similar to propionic acid)
<b>Reactivity</b>	Stable under normal environmental conditions
<b>Degradation Products</b>	None under normal conditions of use. Slowly degrades into oxides of carbon and water.

#### Comments

Water solubility and hydrolytic stability tests were conducted on this polymer according to OECD protocols 120 and 111, respectively. It showed some water solubility throughout the pH range 4 - 9. However, this polymer was found to be very hydrolytically stable throughout this pH range at 50°C. E-01 is a solution of a styrene acrylic copolymer in water at basic condition.

The Tg of this polymer was tested using Differential Scanning Calorimetry (DSC). Test temperature range: 25°C to 150°C at 15°C/min

Density of the polymer was measured using a Pynchometer method (Weight/Volume).

#### 5. INTRODUCTION AND USE INFORMATION

##### MAXIMUM INTRODUCTION VOLUME OF NOTIFIED POLYMER (100%) OVER NEXT 5 YEARS

<i>Year</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Tonnes</i>	15-20	20-25	25-30	30-35	35-40

##### USE AND MODE OF INTRODUCTION AND DISPOSAL

#### Mode of Introduction

The notified polymer will be imported into Australia in a 30% water based polymer resin solution contained in a 220kg closed head plastic drum. It will be transported from the port to a warehouse by truck. It will be transported from the warehouse, by truck, to a customer site where it will be formulated into ink.

#### Reformulation/manufacture processes

During formulation, the notified polymer will be weighed and then transferred to an ink mixing vessel. Once combined with other ingredients, it will be filled into 1-5 L or 200 kg plastic containers. The notified polymer comprises 5 wt. % or less of the wet ink formulation.

#### Use

Binder for printing inks used for corrugated boxes. The polymer acts as a binder between the dyes and the substrate. The packaged containers are shipped to a printing company who will apply the ink to paper used in the manufacture of corrugated boxes. The ink will be applied using standard printing methods using automated printing press machine.

## **6. HUMAN HEALTH IMPLICATIONS**

### **6.1. Exposure Assessment**

#### OCCUPATIONAL EXPOSURE

While transporting and warehousing this polymer, it is unlikely that workers will come into dermal or ocular contact with the notified polymer. During ink formulation, workers will manually weigh and transfer the polymer to a mixing vessel. Workers are expected to wear impermeable gloves, eye protection and protective clothing. During the final application of the ink onto the paper, workers are also expected to wear protective gear. Once the ink has dried, the polymer becomes part of a dried coating and exposure is limited.

#### PUBLIC EXPOSURE

The notified polymer will not be available to the public. The public will come into contact with the notified polymer once the ink dries on a cardboard box. At this point the polymer is not readily available for exposure.

### **6.2. Toxicological Hazard Characterisation**

No toxicological data were submitted. The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard. However, the E-01 solution is classified as hazardous due to the presence of free alkali.

### **6.3. Human Health Risk Assessment**

#### OCCUPATIONAL HEALTH AND SAFETY

The OHS risk presented by the notified polymer is low based on the low hazard and low exposure. In addition, the personal protective equipment and engineering controls further limit exposure during the handling of the product containing the notified substance.

#### PUBLIC HEALTH

The notified polymer is not sold to the public and is only used by industrial ink formulators and printing press operators. Once the polymer is applied and dried, it becomes part of the paper container and hence is not bioavailable. Therefore, the risk to the public is considered very low.

## **7. ENVIRONMENTAL IMPLICATIONS**

### **7.1. Exposure Assessment**

#### ENVIRONMENTAL RELEASE

No aquatic environment exposure is expected during the import of the notified polymer; the polymer will be imported in a closed head plastic drum and sold to an ink manufacturer.

A small amount (<1%) of the notified polymer could be washed off from printing machinery during the normal cleaning process using an organic solvent mix. A licensed disposal contractor for off-site solvent regeneration will deal with this, with the notified polymer being disposed of to landfill.

Residues remaining in the import containers (1-2%) will be disposed of either through metal recycling companies or the controlled waste system (plastic cans) and be disposed of by incineration or washed and sent to landfill.

The majority of the notified polymer will be bound within the cured coating matrix adhering to printing inks, varnishes and self-adhesive labels. Once the chemical is within a cured coating it is likely to share the fate of the substrate, which might involve recycling or landfill.

#### ENVIRONMENTAL FATE

The notified polymer is relatively water soluble, expected to be hydrolytically stable and not expected to be readily biodegradable. On the basis of water solubility, the notified polymer is likely to be mobile in soils, and should work its way into the grass root zone and below. The notified polymer should not

hydrolyse (due to the lack of suitable functionality) but is expected to slowly degrade into oxides of carbon and water. Incineration of the notified polymer will result in the generation of water vapour and carbon dioxide. The notified polymer's high molecular weight will preclude absorption across biological membranes and thus it is unlikely to bioaccumulate.

### **7.2. Environmental Hazard Characterisation**

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. This could apply to the notified polymer. However, the toxicity to algae is likely to be further reduced due to the presence of calcium ions, which will bind to the functional groups.

### **7.3. Environmental Risk Assessment**

The notified polymer will be used as a component of inks. Once these inks have been cured the notified polymer is expected to remain within the product matrices. Hence, the majority of the notified polymer will share the fate of the articles into which it is incorporated. It is anticipated that these will be disposed of to landfill or incinerated at the end of their useful lifetime. In landfill it is expected that the notified polymer will remain immobile within the soil. Incineration of the notified polymer will result in the formation of water vapour and oxides of carbon and nitrogen.

The above considerations indicate minimal risk to the environment when the notified polymer is used in the proposed manner.

## **8. CONCLUSIONS**

### **8.1. Level of Concern for Occupational Health and Safety**

There is Low Concern to occupational health and safety under the conditions of the occupational settings described in this document.

### **8.2. Level of Concern for Public Health**

There is Negligible Concern to public health when used in the proposed manner.

### **8.3. Level of Concern for the Environment**

The polymer is not considered to pose a risk to the environment based on its reported use pattern.

## **9. MATERIAL SAFETY DATA SHEET**

### **9.1. Material Safety Data Sheet**

The notifier has provided MSDS for the product containing the notified polymer as part of the notification statement. The accuracy of the information on the MSDS remains the responsibility of the applicant.

## **10. RECOMMENDATIONS**

### **CONTROL MEASURES**

#### **Occupational Health and Safety**

- 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.

- Printing workers should wear disposable gloves and ensure adequate ventilation is present

when handling containers with ink containing the notified polymer and during routine maintenance and repairs of the printing machinery.

- 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 NOHSC *Approved Criteria for Classifying Hazardous Substances*, workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation must be in operation.

#### Disposal

- The notified polymer should be disposed of to landfill or incineration
- Empty containers should be sent to local recycling or waste disposal facility

#### Emergency procedures

- Accidental, spills/release of the notified polymer should be handled by absorption with sand and putting into a suitable container for disposal. Contaminated containers can be re-used after cleaning

### 10.1. Secondary Notification

The Director of Chemicals Notification and Assessment must be notified in writing within 28 days by the notifier, other importer or manufacturer:

- (1) Under subsection 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 subsection 64(2) of the Act:
  - if any of the circumstances listed in the subsection arise.

The Director will then decide whether secondary notification is required.