File No SAPLC/32

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NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

FULL PUBLIC REPORT

Polymer in FLINT 693 RS

This Self Assessment has been compiled by the applicant and adopted by NICNAS in accordance with the provisions of the *Industrial Chemicals (Notification and Assessment) Act 1989* (Cwlth) (the Act) and Regulations. This legislation is an Act of the Commonwealth of Australia. The National Industrial Chemicals Notification and Assessment Scheme (NICNAS), administered by the Department of Health and Ageing and the Department of the Environment and Heritage has screened this assessment report. The data supporting this assessment will be subject to audit by NICNAS.

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Street Address:	334 - 336 Illawarra Road MARRICKVILLE NSW 2204, 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

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1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)
JohnsonDiversey Australia Pty.Ltd
29 Chifley Street
SMITHFIELD NSW 2164 Australia

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 US TSCA and Korean ECL by Johnson Polymer a division of JohnsonDiversey.

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)
Polymer in FLINT 693 RS

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

Criterion	*Criterion met (yes/no/not applicable)*
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

Appearance at 20°C and 101.3 kPa	Clear, slightly yellow liquid (Product Flint 693RS)
Melting Point/Glass Transition Temp	Tg: 84°C (dry polymer)
Density	1066 kg/m^3 at 25°C (product)
Water Solubility	Ceiling value 1 g/L at 20°C measurement made on dried polymer resin.
Dissociation Constant	pKa=4.88 (estimated to be similar to propionic acid)
Reactivity	Stable under normal environmental conditions
Degradation Products	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. The results showed slight water solubility across pH range of 4-9. However, this polymer was found to be hydrolytically stable throughout this pH range at 50°C. Flint 693RS is a solution of styrene acrylic copolymer in water at basic conditions.

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

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

5. INTRODUCTION AND USE INFORMATION

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

Year	*1*	*2*	*3*	*4*	*5*
Tonnes	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 as a 35% water based polymer resin solution contained in a 220 kg closed head plastic drum. The notified polymer comprises 9% of this solution. 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 3 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 using printing machinery, 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. In solution, if free amine is present a hazard classification may be appropriate.

6.3. Human Health Risk Assessment

OCCUPATIONAL HEALTH AND SAFETY

The OHS risk presented by the notified polymer is low based on the likely low hazard and low percentage of the polymer in the solution. In addition, the personal protective equipment and engineering controls are expected to further limit exposure.

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. Risk to the public is considered low, based on low hazard and negligible exposure.

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 its 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.

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.