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

FULL PUBLIC REPORT

Polymer in NeoRez R-650

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**Director
Chemicals Notification and Assessment**

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FULL PUBLIC REPORT**Polymer in NeoRez R-650****1. APPLICANT AND NOTIFICATION DETAILS**

APPLICANT(S)

Orica Australia Pty Ltd
1 Nicholson Street
MELBOURNE VIC 3000

EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication:

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)

Variation to the schedule of data requirements is claimed as follows:

- Water solubility
- Particle size distribution
- Melting point
- Flammability limits
- Autoignition temperature

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

None

NOTIFICATION IN OTHER COUNTRIES

Canada (2002)

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

Polymer in NeoRez R-650

MOLECULAR WEIGHT

Number-average molecular weight > 1000

3. COMPOSITION

PLC CRITERIA JUSTIFICATION

Molecular weight	The notified polymer satisfies the molecular weight criteria.
Reactive Functional Groups	The notified polymer satisfies the criteria.
Charge Density	The notified polymer has low charge density.
Elemental Criteria	The notified polymer contains only approved elements.
Degradability	The notified polymer is not biodegradable.
Water Absorbing	The notified polymer is not a water-absorbing polymer.
Residual Monomers	All residual monomers are below the relevant cut-off.
Hazard Category	The notified polymer is not classified as a hazardous substance.

The notified polymer meets the PLC criteria.

4. 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>
<i>Tonnes</i>	1	10	10	10	10

USE

The notified polymer is intended for use in ink formulations, which are then applied to paper and plastic packaging films.

5. OPERATIONAL DESCRIPTION

Ink Manufacture

The notified polymer will be formulated into ink at ~5-10 reformulation sites in Australia at which up to 100 batches of ink will be manufactured. Batch ingredients are weighed into a mixer and subjected to high speed shear to produce millbase, which is pumped into a mixing vessel to which additives are added. The finished product is gravity fed through a filter to containers. Inks are stored and transported in 20 L and 60 L open head plastic containers, or 1000 kg plastic bins, and transported by road. The final concentration of the notified polymer in inks is up to 20% by weight.

Ink Application

The ink containing the notified polymer is applied to the packaging film by a flexographic printing unit. The ink is transferred to an ink trough in which a fountain roller is emersed and transfers ink the printing plate. The printing plate then applies the ink to the substrate. Ink is transferred to the ink trough either manually or by pumping from containers.

6. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa

The aqueous dispersion of the polymer is a grey/greenish liquid.

Melting Point/Glass Transition Temp

The boiling point of the polymer dispersion is 100°C (water).

Density

1080 kg/m³

Water Solubility

Not determined. The notifier has identified the notified substance as being an emulsion polymer. The polymerisation process used to produce emulsion polymers occurs in the aqueous phase. However, once a critical molecular weight is reached the polymer becomes insoluble in water. Therefore, the notified polymer is not soluble but dispersible in water.

Particle Size

Polymer is dispersed in water and never isolated

Degradation Products

No degradation is expected under normal environmental conditions.

Loss of monomers, other reactants, additives impurities

No loss of monomers or reactants are expected under normal environmental conditions.

7. HUMAN HEALTH IMPLICATIONS

7.1 Toxicology

Toxicological Investigations

No toxicological data were submitted.

7.2 Human Health Hazard Assessment

The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard. The product containing the notified polymer, Neo-Rez R-650, is a hazardous substance due to the presence of free triethylamine. The product is irritating to eyes, skin and the respiratory tract.

7.3 Occupational Exposure Assessment

Exposure to the notified polymer during transport and storage of the polymer dispersion or the reformulated ink, is not expected except in the event of an accident where the containers may be breached.

Workers involved in the formulation of the ink product may be dermally and possible ocularly exposed to the notified polymer at concentrations up to 38% through leaks and drips from hoses and cam-lock fittings during transfer of the polymer dispersion to the mixing vessel. Overalls, gloves and eye protection are, however, worn during these activities.

Dermal and ocular exposure to the notified polymer at a concentration of up to 20% during quality control testing wear overalls, gloves and eye protection.

Filling of the containers with the final ink product may also provide opportunity for exposure through leaks and drips from hoses and cam-lock fittings during transfer. Workers involved in this activity wear overalls, gloves and eye protection.

Exposure during application may occur as the ink is transferred to the ink trough of the printing unit. Manual transfer may result in dermal and ocular exposure as this method of transfer may generate splashes of the ink formulation. Pumping of the ink product from containers may also result in dermal and ocular exposure to the notified chemical through leaks and drips from hoses and cam-lock fittings.

Workers may also encounter the notified polymer as it exists in its final state as dried ink on the plastic or paper substrate, however, in this state the polymer is bound within a matrix and is unlikely to be bioavailable.

7.4 Public Exposure Assessment

The public will be exposed to the notified polymer as the dried ink on paper and plastic substrates such as cartons and food wrappers. However, in this for the notified polymer is bound within an insoluble matrix and is therefore not bioavailable.

8. ENVIRONMENTAL IMPLICATIONS

8.1 Ecotoxicology

Ecotoxicological Investigations

No toxicological data were submitted.

Environmental Hazard Assessment

The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard.

8.2 Environmental Contamination

Environmental Exposure**TRANSPORTATION AND PACKAGING**

The notified polymer will be imported as an aqueous dispersion (at 38%) and stored and transported in 120 L open head polyethylene drums and 1000 kg polyethylene intermediate bulk containers. It will be transported by road from the Port to licensed chemical storage facilities with engineering controls (ie. bunding) to safeguard against environmental release from spills. It will be distributed by road to ink manufacturers (~5-10) located throughout Australia.

Environmental release is unlikely during importation, storage and transportation, and spillage during a transport accident the most likely reason for environmental release. Individual container capacity and container specifications would limit the extent of release.

RELEASE OF CHEMICAL AT SITE**Ink Production Sites**

There is a low potential for spillage of the notified polymer to occur during ink manufacture. The process is typically undertaken in a closed system, and spills are controlled by bunding within the plant. Mixers are fitted with exhaust ventilation to control emissions to the workplace environment. Inks are filled into containers under exhaust ventilation. The notified polymer is not volatile and emissions are expected to be low.

At ink production sites, the notifier estimates about 200 kg per annum of the notified polymer may be generated as waste as a result of clean up of minor spills and equipment cleaning. Residues of notified polymer in emptied containers may constitute up to 300 kg per annum of waste if they are not rinsed. Aqueous waste will be disposed of through licensed waste disposal contractors for treatment with flocculants. The solid flocculant, and solid wastes, will be sent to landfill for disposal.

RELEASE OF CHEMICAL DURING APPLICATION**Ink Application Sites**

Ink containing the notified polymer will be applied in flexographic printing units. There is a potential for spillage of the ink during transfer of ink to the ink trough of the flexographic unit, which may be undertaken manually or by pumping from containers. Good work practices will minimise the probability of spillage occurring. Spills will be contained within bunded areas. Equipment washing will generate up to 500 kg per annum of ink waste containing the notified polymer. This aqueous waste will be collected and treated through flocculation by licensed waste disposal contractors, with solid flocculate sent to landfill for disposal. The notified polymer is not volatile and losses to the atmosphere are expected to be limited. Due to environmental engineering controls, no environmental release of the notified polymer is expected during the application of the ink containing the notified polymer. Emptied product containers, which may contain up to 300 kg of the notified polymer per annum in product residues, will be sent to recyclers, where they are rinsed and the aqueous waste disposed of through licensed waste disposal contractors for treatment with flocculants. The solid flocculant and solid wastes will be sent to landfill for disposal.

Exposure Assessment (Fate)**RELEASE OF CHEMICAL FOLLOWING USE**

Ink containing the notified polymer will be applied to paper and plastic film consumer products. Virtually all of the notified polymer will eventually be disposed of through burial in landfills or incinerated. Incineration of waste paper will destroy the compound with the generation of water vapour and oxides of carbon and nitrogen. Some of the printed paper may enter the paper recycling process. During such processes, waste paper is repulped using a variety of alkaline, dispersing and wetting agents, water emulsifiable organic solvents and bleaches. These agents enhance fibre separation, ink detachment from the fibres, pulp brightness and the whiteness of paper. The majority of the notified polymer is likely to partition to new paper products or sludge waste, with sludges dried and sent to landfills for disposal. It is anticipated that prolonged residence in an active landfill environment would eventually degrade the notified polymer via the processes described above.

Disposal

It is expected that the majority of wastes generated during manufacture, application and following use in consumer products will be disposed of through licensed waste contractors to landfill.

9. RISK ASSESSMENT

9.1. Environment

Most of the notified polymer will interact with other ink components to form a stable polymer matrix and, once dry, is expected to be immobile and pose little risk to the environment. The notified polymer is not likely to present a hazard to the environment when it is stored, transported and used in the proposed manner.

Wastes generated during formulation and application will be sent to landfill for disposal. In landfill, the notified polymer in solid wastes is expected to be immobile, and eventually will degrade through biotic and abiotic processes, and consequently, should not pose a significant exposure hazard to the environment.

9.2 Occupational health and safety

The OHS risk presented by the notified polymer is expected to be low due to the low hazard associated with the notified polymer and the engineering controls in place during the manufacture and application of the ink. Also, protective equipment is worn by workers involved in the formulation and application of the ink products.

9.3 Public health

The notified polymer will not be available to the public. Members of the public may make dermal contact with materials printed with ink containing the notified polymer. However, the risk to public health will be negligible because the notified polymer is of low hazard and bound within a matrix and unlikely to be bioavailable.

10. CONCLUSIONS – ASSESSMENT LEVEL OF CONCERN FOR THE ENVIRONMENT AND HUMANS

10.2. Environmental risk assessment

The polymer is unlikely to pose an unacceptable risk to the environment based on its reported use pattern.

10.3. Human health risk assessment

10.3.1. Occupational health and safety

There is low concern to occupational health and safety under the conditions of the occupational settings described.

10.3.2. Public health

There is negligible concern to public health when used in the manner described.

11. 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.
- NeoRez R-650 contains 1% triethylamine, and is therefore classified as hazardous according to the NOHSC *Approved Criteria for Classifying Hazardous Substances*.
- Due to the presence of triethylamine, NeoRez R-650 is irritating to the eyes, respiratory system and skin. Engineering controls and personal protective equipment should therefore be in place to mitigate the risk of irritant effects.

- Guidance in selection of personal protective equipment can be obtained from Australian, Australian/New Zealand or other approved standards.
- 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

- Wastes containing the notified polymer should be disposed of to landfill in accordance with the methods described in the Material Safety Data Sheet by licensed waste contractors in accordance with local jurisdiction waste management guidance.

Emergency procedures

- Spills/release of the notified polymer should be handled by containing and absorbing with sand, soil or other inert material. The waste can then be collected and sealed in appropriately labelled drums for disposal.

12.1. 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.

No additional secondary notification conditions are stipulated.