

Website Document Details

NICNAS Website Page

PLC/759

INDEX and KEY WORDS

| Chemical | Number | Type | Use | H/ND | Date |
|---------------------------|--------|------|----------------------|--------------------------------------|---------------|
| Polymer in HH2540Gbase | 759 | PLC | Printing Industry | Not determined to be hazardous | 30 April 2008 |

Use* (Index field) Choose ONE only from:

Engineering (adhesives/sealants, concrete, other), Cosmetics/Personal (hair, nail, lip, skin, cleaners-hand/body, eye, oral cavity, perfume, deodorant, personal products), Domestic/Cleaning (Air freshner/deodoriser, cleaners-surface, dishwashing/laundry), Education, Research & Development, Electrical/Electronic, Explosives, Fuel and Oil (fuel and fuel additives, oil-general, oil-other, hydraulic fluid), Leather Processing (colouring, preservative), Manufacture of Other Chemicals, Mining and Metal Extraction (flotation agent, other), Office Supplies (photocopying/laser printing, inkjet printing, other office supplies), Packaging, Paper & Pulp (surface chemicals, other additives), Photographic (film and paper manufacture, developing chemicals), Plastics (Monomers, catalysts, base resins, additives-flame retardants, additive-antimicrobial, additives-other), Printing Industry (acrylates/plate making, inks, other lithographic applications), Refrigeration, Surface Coatings (auto-refinishing, auto-original equipment manufacture, architectural-solvent based, architectural-water based, industrial coatings), Textile Processing (dyes, softners, other), Water Treatment, Other

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| Title | Polymer in HH2540Gbase |
| Subject | PLC/759 |
| Author | NICNAS |
| Keywords | 30 April 2008, Toyo Ink Australia Pty Ltd (ABN 29 006 294 837), The notified polymer acts as a binder in rotary press and offset lithographic printing inks (< 40% notified polymer). |

File No PLC/759

30 April 2008

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

FULL PUBLIC REPORT

HH2540Gbase

This Assessment has been compiled 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) is administered by the 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 Department of the Environment, Water, Heritage and the Arts.

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 334-336 Illawarra Road, Marrickville NSW 2204.

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:

| | |
|-----------------|--|
| 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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FULL PUBLIC REPORT**HH2540Gbase****1. APPLICANT AND NOTIFICATION DETAILS**

APPLICANT

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

NOTIFICATION CATEGORY

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, and Import Volume.

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)

No variation to the schedule of data requirements is claimed.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT

None

NOTIFICATION IN OTHER COUNTRIES

None

2. IDENTITY OF CHEMICAL

MARKETING NAME

WD LEC SOY YELLOW PM (< 40% Notified Polymer)

OTHER NAME

Rosin modified phenolic resin

MOLECULAR WEIGHT (MW)

Number Average Molecular Weight (Mn) >1000 Da

REACTIVE FUNCTIONAL GROUPS

The notified polymer contains only low concern functional groups.

3. PLC CRITERIA JUSTIFICATION*Criterion*

Molecular Weight Requirements
Functional Group Equivalent Weight (FGEW) Requirements
Low Charge Density
Approved Elements Only
Stable Under Normal Conditions of Use
Not Water Absorbing
Not a Hazard Substance or Dangerous Good

Criterion met

Yes
Yes
Yes
Yes
Yes
Yes
Yes

The notified polymer meets the PLC criteria.

4. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|-----------------------------------|---|
| Appearance at 20°C and 101.3 kPa: | Brown to yellow coloured flakes |
| Softening Point | 165°C |
| Density | Not determined. The notified polymer is imported in an ink paste. |
| Water Solubility | Insoluble The notified polymer is not expected to be water soluble on the basis that majority of the monomer constituent is rosin, known to be very insoluble. |
| Dissociation Constant | The notified polymer has an anionic functionality likely to have typical acidity (pKa = 4-5).. |
| Particle Size | Not determined as the notified polymer is imported in an ink paste. The notified polymer itself has a waxy, flaky consistency and is not expected to generate inhalable particles. |
| Reactivity | Stable under normal environmental conditions |
| Degradation Products | None under normal conditions of use. The notified polymer contains linkages that may hydrolyse under extreme pH. However, significant hydrolysis is unlikely to occur in the environmental pH range of 4-9. |

Comments

The notifier has indicated the potential for flammability, based on the flammability of one of the monomers.

5. INTRODUCTION AND USE INFORMATION

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

| Year | 1 | 2 | 3 | 4 | 5 |
|--------|--------|--------|--------|--------|--------|
| Tonnes | 50-150 | 50-150 | 50-150 | 50-150 | 50-150 |

Use

The notified polymer acts as a binder in rotary press and offset lithographic printing inks (< 40% notified polymer). The formulated inks are used by printers for printing documents such as magazines and advertising paper.

There will be no manufacture or reformulation done in Australia. The inks are delivered to the printing site in sealed cans or drums. At the printing sites, the finished inks containing the notified polymer are added to the printing presses together with other ingredients in order to print documents such as magazines and advertising paper. The ink paste is scooped into the enclosed inking units and the ink will then be transferred to the paper by a system of rollers. The image to be printed is covered with the ink and this inked imaged is rotated against the printed material (e.g. paper). The metering and application of the ink on the machine is conducted automatically. The residual ink in the ink units is transferred back to the original container by the use of a pumping system.

Printing press operators monitor the operation of the press machines, keeping the paper feeders well stocked. They make adjustments to correct uneven ink distribution, speed, and temperatures in the drying chamber. If paper jams or tears and the press stops, the operators quickly correct the problem to minimise downtime. Throughout the run quality control is carried out by a computerized system. The parts of the printing press that are covered with ink will be wiped clean using rags and solvents typically.

Mode of Introduction and Disposal

The notified polymer will be imported by sea as finished ink products (in paste form) in 1 kg metal cans or in 160 kg metal drums. From the Melbourne port, the cans and drums will then be transported by road to the notifier's warehouse before being distributed to customers across Australia.

6. HUMAN HEALTH IMPLICATIONS

Hazard Characterisation

No toxicological data were submitted. The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard.

It is considered that in the form the notified polymer is imported and under the conditions of use, flammability is unlikely to be a significant hazard.

Occupational Health and Safety Risk Assessment

Dermal, ocular and/or inhalation exposure from the finished ink product containing the notified polymer may potentially occur during the opening of the containers, transfer of the ink into the inking units and the cleaning of the printing press. However, exposure to significant amounts of the notified polymer is limited because of the largely enclosed and automated processes, and the use of ventilation and extraction systems, as well as personal protective equipment (PPE) worn by workers. After application and once dried, the ink containing the notified polymer will be largely bound to the substrate to which it is applied.

Overall, the OHS risk presented by the notified polymer is expected to be low, based on the low exposure to workers and the low intrinsic hazard of the polymer.

Public Health Risk Assessment

The notified polymer will not be sold to the public except in the form of printed articles. There is high potential for dermal exposure to the printed materials such as newspapers and magazines. However, the notified polymer will be largely bound to the substrate to which it is applied and dermal contact should be limited to the fingertips only and therefore the exposure is expected to be low. The risk to public health will be low due to the assumed low hazard of the notified polymer.

7. ENVIRONMENTAL IMPLICATIONS

Environmental Hazard Characterisation

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, this is unlikely to apply to the notified polymer.

Environmental Release

Release to the environment during shipping, transport and warehousing will only occur through accidental spills or leaks of the containers with the ink formulations within them. It is estimated that a maximum of 0.2% resulting in up to 300 kg per annum of the notified chemical will be lost during spillage. Spills will be contained and soaked up with inert adsorbent material (sand, soil, vermiculite etc) and placed in sealable container for appropriate disposal to landfill.

A minimal amount of the polymer (< 1%) is wasted during the start-up of printing presses, and a significant proportion of this will be applied to the substrate (paper for example) and this becomes printed waste paper and is likely to enter the recycling chain. A minimal amount of the polymer may be washed off during cleaning of printing machinery. Approximately 1% amounting to 1500 kg of the notified polymer is likely to be lost from cleaning of equipment. It is expected that this will be collected for disposal to landfill in accordance with local, State and Federal regulations.

Residues remaining in the imported containers will be rinsed with a small amount of suitable solvent. The rinsate will be fed back into the printing press for reuse and the import containers will be sent to landfill.

The remainder of the notified polymer will be bound to printed articles and hence will not be available for direct release to the environment. The eventual fate of printed articles is recycling or landfill.

Environmental Fate

The notified polymer is expected to be hydrolytically stable. Due to its hydrophobic nature, it is expected that the notified polymer in landfill will associate with sediments and organic phases of soil and sediments, and slowly degrade to simple carbon compounds.

While environmental exposure is limited during the printing process, the total import volume of the notified polymer will ultimately be disposed of in either landfill or be incinerated. The widespread use pattern indicates

that landfills throughout Australia would receive the notified polymer as residues in the original packaging and on paper products. The residual ink would be expected to remain within the packaging unless breached. On paper the notified polymer will interact with other components to form a stable polymer matrix and, once dry, is expected to be immobile and pose little risk to the environment.

During recycling 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. These aqueous wastes are expected to go to sewer. Very little of the notified polymer is expected to partition to the supernatant water which is released to the sewer. Sludge generated during the washing process is dried and incinerated or sent to landfill for disposal.

Environmental Risk Assessment

The notified polymer will be a component of formulated ink preparations. Once these inks have been used in order to print documents such as magazines and advertising materials the notified polymer is expected to remain within the article 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 articles will be disposed of by landfill or incinerated after use.

In landfill, it is expected that the notified polymer will remain immobile within the matrices. Incineration of the notified polymer will result in the formation of water vapour and oxides of carbon.

Paper recycling will result in the notified polymer ending up as a sludge, which is then disposed of as landfill or incinerated by licensed waste contractors.

Given the widespread and disperse environmental exposure, together with the low expected toxicity of the notified polymer it is not considered to pose a risk to the environment when it is stored, transported and used in the proposed manner.

8. CONCLUSIONS AND RECOMMENDATIONS

Human health risk assessment

Under the conditions of the occupational settings described, the notified polymer is not considered to pose an unacceptable risk to the health of workers.

When used in the proposed manner, the notified polymer is not considered to pose an unacceptable risk to public health.

Environmental risk assessment

Based on the reported use pattern, the notified polymer is not considered to pose a risk to the environment.

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.

- 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.

Disposal

- The notified polymer should be disposed to landfill.

Storage

- Keep containers in a cool area.
- Keep away from sources of ignition.

Emergency procedures

- Spills/accidental release of the notified polymer should be handled by physical containment with subsequent collection with inert adsorbent material (sand, dirt, diatomaceous earth, vermiculite etc) for safe disposal. Do not allow to enter drains or waterways.

Regulatory Obligations

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 chemical 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 a binder in rotary press and offset lithographic printing inks (< 40% notified polymer), or is likely to change significantly;
 - the amount of notified polymer being introduced has increased from 150 tonnes, or is likely to increase, significantly;
 - if 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 notified polymer and products containing the notified polymer provided by the notifier were reviewed by NICNAS. The accuracy of the information on the MSDS remains the responsibility of the applicant.