File No SAPLC/80

January 2008

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

FULL PUBLIC REPORT

Polymer in Bayhydrol 124

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, Water, Heritage and the Arts has screened this assessment report. The data supporting this assessment will be subject to audit by NICNAS.

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:

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Director
NICNAS

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1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT
Bayer Material Science (ABN: 22 000 138 714)
391 Tooronga Road
Hawthorn East, VIC 3123

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; Use Details; Manufacture/Import Volume; Site of Manufacture/Reformulation; Concentration of notified polymer in imported product.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)
NONE

NOTIFICATION IN OTHER COUNTRIES
NONE

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)
Bayhydrol 124

MOLECULAR WEIGHT (MW)
Number Average Molecular Weight (NAMW) >1000

REACTIVE FUNCTIONAL GROUPS
The notified polymer contains only low concern functional groups.

3. PLC CRITERIA JUSTIFICATION

Criterion	*Criterion met*
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

Unless otherwise stated, the below physical and chemical properties are for the product Bayhydrol 124 containing the notified polymer at concentrations of <50%.

Appearance at 20°C and 101.3 kPa	White dispersion
Boiling Point	100°C (boiling point of water)
Density	1100 kg/m^3
Water Solubility	The notified polymer contains a high proportion of hydrocarbons and few polar carboxylate (anionic) urethane and urea linkages, which may have some affinity for water. Consequently the notified polymer is expected to have low water solubility.
Dissociation Constant	Contains carboxylate group, which is expected to have a pKa between 3 and 5.
Reactivity	Contains hydrolysable functionality but expected to be stable under normal environmental conditions and pH 4-9 range. Hazardous polymerisation does not occur.
Degradation Products	None under normal conditions of use. Hazardous decomposition products are: carbon dioxide, carbon monoxide, oxides of nitrogen, hydrogen cyanide, isocyanate, isocyanic acid.

5. INTRODUCTION AND USE INFORMATION

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

Year	*1*	*2*	*3*	*4*	*5*
Tonnes	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10

USE AND MODE OF INTRODUCTION AND DISPOSAL

Mode of Introduction

The notified polymer will not be manufactured in Australia. It will be imported as a dispersion in water at < 50% concentration (Bayhydrol 124). The notified polymer will be imported by sea in 200L steel drums.

Upon arrival at Melbourne port the notified polymer will be transported by road to the notifier's warehouse where it will be stored under cover until such time that it is transported to the customer (commercial textile facilities).

Use

Bayhydrol 124 will not be manufactured or reformulated in Australia. At the customer's site the Bayhydrol 124 product will be pumped from the import drums to a liquor basin under local exhaust ventilation. It will then be applied to the textile by "kiss roll" machinery (see Fig 1 and 2). This process involves finishing of nonwovens for small quantities of application in the high speed range. Bayhydrol 124 will be pumped via automated systems from the liquor basin by the applicator roll and then evenly applied to the textile over the whole width. The desired application volume is defined by the rotation speed of the applicator roll.

Figure 1: KissRoll Applicator with preparation station

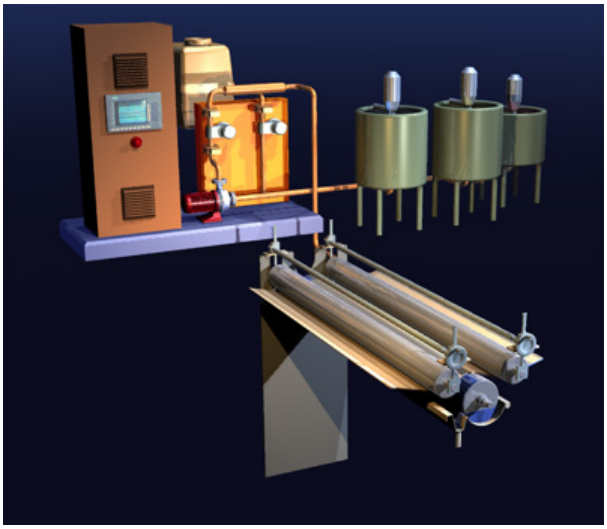

Figure 2. KissRoll Applicator Schematic Illustration

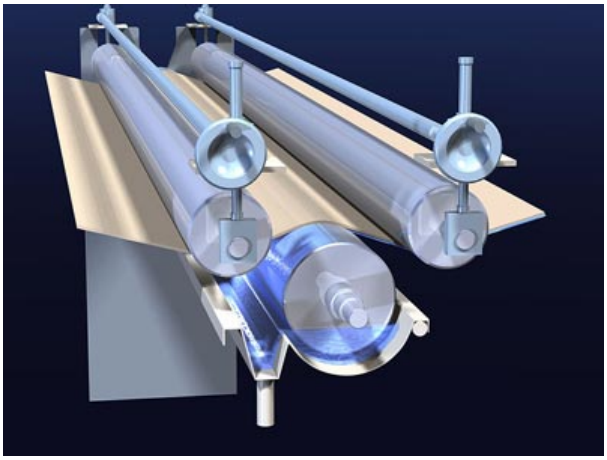

Figure 1 and figure 2 above where extracted from:
http://www.kuesters.com/finishingcoating,nonwoven,2,977.htm

After coating of the textile it will then be cured and transferred to the warehouse before being on-sold to customers.

The notified polymer will be used as an additive in coatings for rigid or flexible substrates such as leather, vinyl coated fabric, textiles, plastics and metals. The immediate use of the notified polymer will be in the coating of textile to be used in the manufacture of textile conveyor belts. These textile conveyor belts will be used in paper and mining applications.

6. HUMAN HEALTH IMPLICATIONS

6.1. Exposure Assessment

OCCUPATIONAL EXPOSURE

Application of Bayhydrol 124

Workers may be exposed to the notified polymer via dermal and ocular exposure due to drips, spills and splashes during transfer of Bayhryol 124 from drums to the liquor basin. Such exposure will be limited by the use of local exhaust ventilation and workers wearing personal protective equipment such as coveralls, goggles and impervious gloves.

Dosing to the "Kiss roll" applicator from the liquor basin uses automated processes. Drying and curing of the textile will occur in a closed system. Exposure to workers is not expected during these processes, however, any potential exposure should be minimised by the use of local exhaust ventilation.

Exposure may also occur to a lesser extent during the cleaning of machinery, however, this should be minimised by workers wearing gloves, safety goggles, and protective clothing during the handling of textile auxiliaries.

Once dried, the notified polymer becomes cross linked within the fibres of the textiles and is therefore not readily bioavailable.

PUBLIC EXPOSURE

The imported product containing < 50% of the notified polymer in dispersion will not be sold to the public. The coating formulation once applied to textile, is cured and becomes a thin, solid and inert film. The coated textile will initially be used in the manufacture of textile conveyor belts for paper and mining applications. Therefore, there is little potential for public exposure to the notified polymer.

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.

6.3. Human Health Risk Assessment

OCCUPATIONAL HEALTH AND SAFETY

Although exposure to the notified polymer could occur during some steps involved in the application of the notified polymer to substrates, such as during transfer from drums to the liquor basin, the risk to workers is considered to be low due to the expected low hazard of the notified polymer.

It should be noted that the notified polymer contains a hazardous residual monomer. Given that the residual is present in Bayhydrol 124 at concentrations <0.5%, the product will not be classified as a sensitiser (by inhalation or skin contact) or as harmful by inhalation, and the risk of health effects from inhalation or skin sensitisation should be minimal. In addition, worker exposure to the Bayhydrol 124 product will be minimised by the use of local exhaust ventilation and PPE, further reducing the risk of adverse health effects.

The notified polymer also contains a residual monomer (concentration of <1%) that is classified as highly flammable. It is noted that the MSDS supplied by the notifier states that Bayhydrol 124 is not a dangerous good according to Australian Dangerous Goods Code, 6th edition. Under normal conditions of use, flammability of the product is not expected. In addition, precautionary statements to minimise the potential dangerous properties of the product are given on the MSDS.

PUBLIC HEALTH

The imported product containing the notified polymer or the end use products described will not be sold to the public. Therefore, public exposure to the notified polymer is unlikely and the risk of adverse public health effects is negligible.

7. ENVIRONMENTAL IMPLICATIONS

7.1. Exposure Assessment

ENVIRONMENTAL RELEASE

Bayhydrol 124 will be stored in a bunded area at the customer's site until required. The method of automated pumping of Bayhydrol 124 into the liquor basin will minimise any losses. If a spill occurs, it will be contained and soaked up with inert absorbent material (sand, diatomite, acid binders, universal binders or sawdust), placed in a sealable container and disposed of to landfill. Less than 1% (< 100 kg) of the notified polymer is expected to be lost from spills or leaks.

The method of application of the notified polymer to textile necessitates production of large batches of coating mixture as the take-up rate on the textile is low (approx. 2 g/m^2). The resulting high volume of excess coating mixture will be retained and used for future coating of textile. There will be no release of Bayhydrol 124 to the sewer as it will be collected and kept for future use.

The washings from the process lines will be collected and reused.

Residues remaining in the empty drums are estimated to be 0.5% (< 50 kg per year of the notified polymer). The empty drums will be collected by a licensed waste contractor for disposal to landfill.

ENVIRONMENTAL FATE

The coating containing the notified polymer, when applied and allowed to dry, becomes a thin, solid, inert film on the textile. When the textile is disposed of to landfill, the notified polymer is unlikely to be mobile and is not expected to leach out.

Due to its expected very low water solubility, the notified polymer is unlikely to be mobile in soils and landfill since the majority will be bound to textiles in an inert matrix. If the polymer does enter the leachate it will be present at very low concentrations and unlikely to be mobile. The notified polymer will eventually degrade through abiotic and biotic processes.

7.2. 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. 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 is not released to sewer and no PEC can be calculated.

The high molecular weight indicates that bioaccumulation is also unlikely.

Some of the notified polymer is likely to be disposed of to landfill along with the coated textile at the end of its useful life. The polymer is bound in an inert film and will not leach into groundwater. In landfill the film is expected to slowly degrade by biotic and abiotic processes, and mineralize to water and oxides of carbon and nitrogen.

When used as a coating for specialized industrial textiles as indicated, the environmental hazard from use of the notified polymer is assessed as low.

8. CONCLUSIONS

8.1. Occupational Health and Safety Risk Assessment

Under the conditions of the occupational settings described, the risk to workers is not considered to be unacceptable.

8.2. Public Health Risk Assessment

When used in the proposed manner the risk to the public is not considered to be unacceptable.

8.3. Environmental Risk Assessment

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 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.

- 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 waste should be disposed of to landfill. Empty drums should be sent to waste disposal facilities.

Emergency procedures

- Spilt notified polymer should be collected and placed in suitable containers for disposal.

11. 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 chemical 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 chemical has changed from an additive in coatings for rigid or flexible substrates, or is likely to change significantly;

- the amount of chemical being introduced has increased from 10 tonnes per annum, or is likely to increase, significantly;
- if the chemical 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.