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NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

FULL PUBLIC REPORT

Polymer in Setal 1606 BA-80

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 Sustainability, Environment, Water, Population and Communities.

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 Level 7, 260 Elizabeth Street, Surry Hills NSW 2010.

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(S)
Nuplex Industries (Aust) Pty Ltd (ABN: 25 000 045 572)
49-61 Stephen Road
Botany, NSW 2019

NOTIFICATION CATEGORY
Limited: Synthetic polymer with Mn ≥1000 Da.

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, analytical data, polymer constituents, residual monomers, impurities, additives/adjuvants, use details and import volume.

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)
Variation to the schedule of data requirements is claimed as follows: all physico-chemical endpoints (with the exception of water solubility and melting point)

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)
None

NOTIFICATION IN OTHER COUNTRIES
Canada and U.S.A - 2011

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)
Setal 1606 BA-80 (>50% notified polymer)

MOLECULAR WEIGHT
>1,000 Da

ANALYTICAL DATA
Reference IR and GPC spectra were provided.

3. COMPOSITION

DEGREE OF PURITY >99%

4. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AT 20 °C AND 101.3 kPa: clear viscous liquid. Under normal conditions, the notified polymer is not isolated from solution.

Property	Value	Data Source/Justification
Glass transition temperature	-9.7 °C	Measured – Nuplex analytical laboratories (study report not available)
Density	1150 kg/m^3 at 20 °C	Calculated (MSDS: 1080 kg/m^3 at 20 °C*)
Vapour Pressure	Not determined	Based on the high molecular weight, vapour pressure is expected to be low.
Water Solubility	≤LOD (0.2 g/L) at 20 °C (pH 2, 6 and 9) and 37 °C (pH 7)	Measured
Hydrolysis as a Function of pH	Not determined	Contains hydrolysable functionality. However, due to its low water solubility, hydrolysis is expected to be slow in the

		environmental pH range (4-9).
Partition Coefficient (n-octanol/water)	Not determined	Expected to partition from water to oil based on its hydrophobic structure
Adsorption/Desorption	Not determined	Expected to partition to soil, sediment and sludge based on its hydrophobic structure
Dissociation Constant	Not determined	Does not contain dissociable functions
Flash Point	Not determined	Not isolated from solution. The notified polymer is manufactured in flammable solvent.
Autoignition Temperature	370 ºC*	MSDS
Explosive Properties	Not determined	Contains no functional groups that would imply explosive properties.

*Setal 1606 BA-80 containing >50% notified polymer

DISCUSSION OF PROPERTIES
For full details of tests on physical and chemical properties, refer to Appendix A.

Reactivity
The notified polymer is expected to be stable under normal conditions of use. It will react in end-use when mixed with the other component of a two-part coating. Decomposition will occur at elevated temperatures.

Dangerous Goods classification
Based on the limited submitted physical-chemical data in the above table the notified polymer is not classified according to the Australian Dangerous Goods Code (NTC, 2007). However, the data above do not address all Dangerous Goods endpoints. Therefore consideration of all endpoints should be undertaken before a final decision on the Dangerous Goods classification is made by the introducer of the polymer.

5. INTRODUCTION AND USE INFORMATION

MODE OF INTRODUCTION OF NOTIFIED CHEMICAL (100%) OVER NEXT 5 YEARS
The notified polymer will be imported as a component of formulated paint products at ≤10% concentration.

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

Year	*1*	*2*	*3*	*4*	*5*
Tonnes	1-5	1-5	5-15	5-15	5-15

PORT OF ENTRY
Sydney

IDENTITY OF MANUFACTURER/RECIPIENTS
Nuplex Industries (Aust) Pty Ltd

TRANSPORTATION AND PACKAGING
The products containing the notified polymer (at ≤10%) will be imported in 30, 15, 3.5, 1 and 0.5 L steel cans. The products will be distributed by road to end-users without repackaging.

USE
The notified polymer will be used as a component of paint products for the automotive industry.

OPERATION DESCRIPTION
Typical processes are as follows:

Upon delivery of the imported products (≤10% notified polymer) to end-users, e.g. car manufacturing plants and car repair shops, they will be mixed with the other component of two-part coatings. The finished paints will then be applied by spray using hand-spraying equipment or a robotic spraying system. In general, the spraying is expected to take place in purpose-built spray booths.

6. HUMAN HEALTH IMPLICATIONS

6.1. Exposure Assessment

6.1.1. Occupational Exposure

NUMBER AND CATEGORY OF WORKERS

Category of Worker	*Number*	*Exposure Duration (hours/day)*	*Exposure Frequency (days/year)*
Transport and storage	5	1	10
Spray painters (per site)	10	1	200

EXPOSURE DETAILS
Transport and storage workers may come into contact with the imported product (≤10% notified polymer) only in the event of accidental rupture of containers.

Dermal and ocular exposure of spray painters to the notified polymer (at ≤10% concentration) may occur during blending and transfer processes, application, cleaning and maintenance tasks. Inhalation exposure to the notified polymer may occur during spray application processes.

In general, it is expected that exposure will be limited by the use of spray booths, or other ventilation sources when spraying is not conducted in a purpose-built booth. In addition, exposure to the notified polymer will be minimised by the use of personal protective equipment (PPE: chemical goggles, impervious gloves, appropriate industrial clothing and respirators during application).

Once the paint is cured, the notified polymer is not expected to be bioavailable and further dermal contact should not lead to exposure.

6.1.2. Public Exposure
The notified polymer is intended for industrial use only. Therefore, the public may be exposed to the imported product (≤10% notified polymer) only in the event of a transport accident. As the polymer is being used as a component of automotive paint products, where it will be cured, there will be no public exposure from articles to which the coating has been applied.

6.2. Human Health Effects Assessment

No toxicity data were submitted.

Based on the high molecular weight (>1000 Da) of the notified polymer, the potential for the notified polymer to cross the gastrointestinal (GI) tract by passive diffusion or to be dermally absorbed after exposure is limited. However, the polymer contains an appreciable proportion of low molecular weight species (<1000 Da) that may be absorbed. In addition, given the hydrophobic nature of the polymer (and the lower molecular weight species), absorption across the lung is possible.

The notified polymer contains ester and aliphatic monoalcohol moieties, which are structural alerts for skin and eye irritation (Hulzebos *et al*., 2005; Tsakovska *et al*., 2007). However, given the nature of the notified polymer (including structure, molecular weight and proportion of low molecular weight species), the potential for the notified polymer to be irritating is considered to be limited.

Health hazard classification
As no toxicity data were provided for the notified polymer, it cannot be classified according to the *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

6.3. Human Health Risk Characterisation

6.3.1. Occupational Health and Safety
No toxicological data were provided for the notified polymer. Given the appreciable proportion of low molecular weight species, irritation effects following contact with the notified polymer cannot be excluded. However, at the specified introduction and usage concentration of ≤10%, irritation effects are not expected.

Given the appreciable proportion of low molecular weight species, steps should be taken to avoid exposure to the notified polymer, particularly via the inhalation route. Thus, provided control measures are in place to

reduce exposure, including spray booths (or other sources of ventilation) and the use of PPE, the overall risk of exposure to the notified polymer is expected to be low.

Therefore, the risk to the health of workers from use of the notified polymer is not considered to be unreasonable.

6.3.2. Public Health

The notified polymer is intended for use in industrial applications by qualified operators. The public may come into contact with products containing the cured coating, where the notified polymer will be unavailable for exposure. Therefore, when used in the proposed manner, the risk to public health from the notified polymer is not considered to be unreasonable.

7. ENVIRONMENTAL IMPLICATIONS

7.1. Environmental Exposure & Fate Assessment

7.1.1. Environmental Exposure

RELEASE OF CHEMICAL AT SITE

The notified polymer will be imported at up to 10% concentration in one component of a two-part coating for the automotive industry. The release of the notified polymer to the environment during importation, storage, and transport is unlikely. However, in the event of a transport accident the capacity and specifications of the import containers are likely to minimise the extent of any such releases. Releases that do occur as a result of accidents are expected to be physically contained, absorbed on inert material, and either reused or sent for safe disposal to landfill.

RELEASE OF CHEMICAL FROM USE

The coatings containing the notified polymer will be mixed with the other component of two-part coatings prior to application. The mixture will then be loaded into the spray equipment and applied to the car. The main release of notified polymer during use is expected to be as overspray, accounting for up to 10% of the imported notified polymer. Overspray is expected to be collected within spray booths by engineering controls and any volatile materials will be captured by filtering systems. A maximum of 3% of the imported quantity of notified polymer will be released as equipment washings, container residues and accidental spills. These releases are expected to be collected and disposed of to landfill, although minor amounts could potentially be released to sewer.

RELEASE OF CHEMICAL FROM DISPOSAL

The notified polymer in coatings is expected to share the fate of the automobiles to which it has been applied. The notified polymer in coatings will therefore either be thermally decomposed during metal reclamation processes or disposed of to landfill.

7.1.2. Environmental Fate

No environmental fate data were submitted. The majority of the notified polymer is expected to be cured into an inert matrix as part of its normal use pattern as a component in automotive coatings. The notified polymer will be irreversibly bound into the matrix and, in this form, is not expected to be bioavailable nor biodegradable. Notified polymer in solid waste disposed of to landfill, is not expected to be mobile and will slowly degrade *in situ*, primarily by abiotic processes. The notified polymer will eventually degrade in landfill, or by thermal decomposition during metal reclamation processes, to form water and oxides of carbon.

Significant amounts of notified polymer are not expected to be released to the aquatic environment. Bioaccumulation of the notified polymer is unlikely due to its high molecular weight and its limited release to surface waters.

7.1.3. Predicted Environmental Concentration (PEC)

The predicted environmental concentration (PEC) has not been calculated for the notified polymer as, based on its assessed use pattern, ecotoxicologically significant quantities are not expected to be released to the aquatic environment.

7.2. Environmental Effects Assessment

No ecotoxicological data were submitted. Polymers without significant ionic functionality are generally of low concern to the environment.

7.2.1. Predicted No-Effect Concentration

A predicted no-effect concentration (PNEC) has not been calculated for the notified polymer as, based on its assessed use pattern, ecotoxicologically significant quantities are not expected to be released to the aquatic environment.

7.3. Environmental Risk Assessment

The risk quotient (Q = PEC/PNEC) for the notified polymer has not been calculated as release to the aquatic environment in ecotoxicologically significant quantities is not expected based on its assessed use pattern as a component in automotive coatings. The majority of the notified polymer will be disposed to landfill as cured coating. In its cured state the notified polymer is irreversibly bound into the inert coating matrix and is unlikely to leach or be bioavailable. Due to its limited environmental exposure, the risk of the notified polymer to the environment is not expected to be unreasonable based on its assessed use pattern.

8. CONCLUSIONS AND REGULATORY OBLIGATIONS

Hazard classification

As no toxicity data were provided for the notified polymer, it cannot be classified according to the *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008(2004)].

Human health risk assessment

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

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

Environmental risk assessment

On the basis of the assessed use pattern, the notified polymer is not considered to pose an unreasonable risk to the environment.

Recommendations

CONTROL MEASURES

Occupational Health and Safety

- Employers should implement the following engineering controls to minimise occupational exposure to the notified polymer:
  - Spray booths (or other ventilation) during application

- Given the appreciable proportion of low molecular weight species, employers should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified polymer:
  - Gloves, goggles, overalls
  - Respiratory protection during spray applications

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

- Spray applications should be carried out in accordance with the Safe Work Australia *National Guidance Material for Spray Painting* [NOHSC (1999)] or relevant State and Territory Codes of Practice.

- 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 of to landfill.

Emergency procedures

- Spills or accidental release of the notified polymer should be handled by physical containment, collection and subsequent safe disposal.

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 chemical, 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 polymer has a number-average molecular weight of less than 1000;

or

(2) Under Section 64(2) of the Act; if
- the function or use of the polymer has changed from a component of paint products, or is likely to change significantly;
- the amount of polymer being introduced has increased from 15 tonnes per annum, or is likely to increase, significantly;
- the polymer has begun to be manufactured in Australia;
- additional information has become available to the person as to an adverse effect of the polymer 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 a product containing the notified polymer provided by the notifier was reviewed by NICNAS. The accuracy of the information on the MSDS remains the responsibility of the applicant.

APPENDIX A: PHYSICAL AND CHEMICAL PROPERTIES

Water Solubility ≤LOD (0.2 g/L) at 20 °C (pH 2, 6 and 9) and 37 °C (pH 7)

Method	OECD TG 120 Solution/Extraction Behaviour of Polymers in Water
Remarks	Flask Method. Three samples of test substance (1.2 g) were added to three flasks of 120 mL double distilled water. Each flask was magnetically stirred at 20 °C for 24 hours. The aqueous phases (pH = 6) were filtered separately using two types of filters (paper and plastic). The non-volatile matter was measured gravimetrically after drying aliquots of the aqueous phases (approximately 0.5 g) at 130 °C for 45 min. The method was repeated with samples at pH 2, 7 (at 37 °C) and 9.
Test Facility	Nuplex (undated)

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