File No: LTD/1630

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NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

PUBLIC REPORT

Polymer in LITE-3000

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 Public Report may be inspected at our NICNAS office by appointment only at Level 7, 260 Elizabeth Street, Surry Hills NSW 2010.

This 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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SUMMARY

The following details will be published in the NICNAS *Chemical Gazette:*

ASSESSMENT REFERENCE	APPLICANT(S)	CHEMICAL OR TRADE NAME	HAZARDOUS CHEMICAL	INTRODUCTION VOLUME	USE
LTD/1630	Chemiplas Australia Pty Ltd	Polymer in LITE-3000	ND*	≤ 50 tonnes per annum	Component of industrial coatings

*ND = not determined

CONCLUSIONS AND REGULATORY OBLIGATIONS

Hazard classification
As no toxicity data were provided, the notified polymer cannot be classified according to the *Globally Harmonised System for the Classification and Labelling of Chemicals* (GHS), as adopted for industrial chemicals in Australia, or the *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 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 its limited aquatic exposure and the assessed use pattern, the notified polymer is not considered to pose an unreasonable risk to the environment.

Recommendations

REGULATORY CONTROLS
Health Surveillance

- As the notified polymer is a potential skin sensitiser and contains a residual monomer that is classified as a skin sensitiser, employers should carry out health surveillance for any worker who has been identified in the workplace risk assessment as having a significant risk of sensitisation.

(Material) Safety Data Sheet

- The (M)SDS for products containing the notifier polymer should reflect the hazards associated with the residual monomer, if appropriate based on the concentration.

CONTROL MEASURES
Occupational Health and Safety

- A person conducting a business or undertaking at a workplace should implement the following engineering controls to minimise occupational exposure to the notified polymer:
  - Enclosed, automated processes, where possible
  - Spray application in ventilated environments

- Employers should implement the following safe work practices to minimise occupational exposure during handling of the notified polymer:
  - Avoid contact with skin and eyes
  - Avoid inhalation during spray application
  - Avoid contact with uncured coatings or overspray

- A person conducting a business or undertaking at a workplace should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified polymer:
  - Goggles
  - Impervious gloves
  - Coveralls
  - 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 (M)SDS should be easily accessible to employees.

- If products and mixtures containing the notified polymer are classified as hazardous to health in accordance with the *Globally Harmonised System for the Classification and Labelling of Chemicals (GHS)* as adopted for industrial chemicals in Australia, workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation should 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 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 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 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 industrial coatings, or is likely to change significantly;
  - the amount of polymer being introduced has increased from 50 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.

No additional secondary notification conditions are stipulated.

(Material) Safety Data Sheet
The (M)SDS of a product containing the notified polymer provided by the notifier was reviewed by NICNAS. The accuracy of the information on the (M)SDS remains the responsibility of the applicant.

ASSESSMENT DETAILS

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)
Chemiplas Australia Pty Ltd (ABN 29 003 056 808)
3/112 Wellington Parade
EAST MELBOURNE VIC 3002

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, molecular and structural formulae, molecular weight, spectral data, degree of purity, polymer constituents, residual monomers, impurities, use details, import volume and the identities of the recipients.

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)
Variation to the schedule of data requirements is claimed as follows: Vapour Pressure, Hydrolysis as a function of pH, Partition Coefficient, Absorption/Desorption, Dissociation Constant, Flash Point, Flammability Limits, Autoignition Temperature, Explosive Properties.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)
None

NOTIFICATION IN OTHER COUNTRIES
USA (2010)

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)
LITE-3000 (product containing the notified polymer at 70% concentration)

CAS NUMBER
Not Assigned

MOLECULAR WEIGHT
Mn > 1,000

ANALYTICAL DATA
Reference GPC spectrum was provided.

3. COMPOSITION

DEGREE OF PURITY > 90%

HAZARDOUS IMPURITIES/RESIDUAL MONOMERS
One hazardous impurity/residual monomer is present at a level above the concentration cut-off for classification. The impurity is present at a concentration of < 5% and may result in sensitisation by skin contact (R43 classification).

ADDITIVES/ADJUVANTS None

4. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AT 20 °C AND 101.3 kPa: Viscous yellow-brown liquid

Property	Value	Data Source/Justification
Boiling Point	125 °C (decomposed)	Measured
Density	956.6 kg/m^3 at 22.5 °C	Measured
Vapour Pressure	Not determined	Expected to be low, based on the high molecular weight of the polymer
Water Solubility	Water dispersible	Measured
Hydrolysis as a Function of pH	Not determined	Contains hydrolysable functionality. However, significant hydrolysis is not expected under environmental conditions (pH 4-9).
Partition Coefficient (n-octanol/water)	Not determined	The notified polymer is surface active and will tend to accumulate at the phase interface of octanol and water.
Adsorption/Desorption	Not determined	Expected to partition to surfaces from water in the environment based on its surface activity.
Dissociation Constant	Not determined	Contains functionality which may ionise under environmental conditions (pH 4-9)
Particle Size	Not determined	Imported in solution.
Flash Point	Not determined	Imported in flammable solvent
Autoignition Temperature	Not determined	Imported in flammable solvent
Explosive Properties	Not determined	The structural formula contains no explosophores.
Oxidising Properties	Not determined	Contains no functional groups that would imply oxidative properties.

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 during end-use as one part of a multi-part epoxy product.

Physical hazard classification
Based on the submitted physico-chemical data depicted in the above table, the notified polymer is not recommended for hazard classification according to the *Globally Harmonised System for the Classification and Labelling of Chemicals (GHS),* as adopted for industrial chemicals in Australia.

5. INTRODUCTION AND USE INFORMATION

MODE OF INTRODUCTION OF NOTIFIED CHEMICAL (100%) OVER NEXT 5 YEARS
The notified polymer will be imported as a 70% (w/w) solution in xylene.

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

Year	*1*	*2*	*3*	*4*	*5*
Tonnes	10-20	10-20	20-50	20-50	20-50

PORT OF ENTRY
Perth (Fremantle), Sydney, Melbourne, Brisbane

IDENTITY OF MANUFACTURER/RECIPIENTS
Chemiplas Australia Pty Ltd (and other recipients in Adelaide, SA and Brisbane, QLD)

TRANSPORTATION AND PACKAGING
The notified polymer will be imported into Australia as a solution (70% in xylene) in 55-gallon drums. The formulated product will be packaged in 1 L, 4 L or 20 L containers. Transportation of products containing the notified chemical throughout Australia will predominantly be by road.

USE
The notified polymer will be used as an ingredient (≤ 25% concentration) in industrial multi-part epoxy coatings for industrial steel products (e.g. pipelines, railcars, cargo containers or ship hulls).

OPERATION DESCRIPTION
The notified polymer will be used in a two stage process – coating formulation and coating application.

Coating Formulation
The notified polymer (70% (w/w) in xylene) will be emptied (pumped) from 55 gallon drums into a mixing vessel via sealed, metred delivery, and combined with other ingredients into a pre-product. After automated mixing, the formulated pre-product will be packaged into 1 L, 4 L and 20 L containers via a sealed, metered delivery system.

Coating Application
The formulated pre-product may be mixed with additional ingredients to make the end-use epoxy resin coating. The end-use coating (containing ≤ 25% of the notified polymer) will be applied by roller, brush or spray to industrial equipment.

All unused sample material will be recycled into similar products. All empty drums, cans and filters will be disposed of in accordance with local waste regulations.

6. HUMAN HEALTH IMPLICATIONS

6.1. Exposure Assessment

6.1.1. Occupational Exposure

CATEGORY OF WORKERS

Category of Worker	*Exposure Duration (hours/day)*	*Exposure Frequency (days/year)*
Workers involved in coating formulation, testing and quality control and packaging	6	12
Workers overseeing automated mixing during formulation	8	12
Workers involved in handling coating containers	4	12
Workers involved in the application of coatings	4	12

EXPOSURE DETAILS
Transportation and Storage
It is expected that transport and warehouse workers (handling the imported solution containing 70% notified polymer or formulated products containing ≤ 25% notified polymer) will only be exposed to the notified polymer in the unlikely event of an accident.

Coating Formulation
At coating formulation facilities, the processes are expected to be largely automated and enclosed and occur in ventilated environments. Workers may be exposed to the notified polymer (at up to 70% concentration) during the connection and disconnection of the pumping apparatus from the drums, during sampling for quality control purposes and during cleaning and maintenance tasks. Exposure of workers to the notified polymer may occur via the dermal or ocular routes (inhalation exposure of workers to the notified polymer is not expected during coating formulation processes). Personal protective equipment (PPE; including appropriate industrial clothing, eye protection and chemical resistant gloves) is expected to be worn during coating formulation processes to minimise exposure of workers to the notified polymer.

Coating Application
At end-use facilities, workers may be exposed to the notified polymer (at ≤ 25% concentration), during transfer

processes, mixing, application of the coatings and during cleaning and maintenance tasks. Exposure to the notified polymer is expected to be via the dermal and/or ocular routes. Inhalation exposure to the notified polymer is also possible during spray applications. Exposure to the notified polymer is expected to be minimised through the use of PPE, including appropriate industrial clothing, eye protection and chemical resistant gloves (and respiratory protection during spray applications).

Once the coating 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 products containing the notified polymer (at up to 70% concentration) are intended for use in industrial settings only and will not be sold to the public. Therefore, the public may come into contact with these products only in the unlikely event of a transport accident. The public may (infrequently) come into contact with surfaces that have been coated with coatings containing the notified polymer. However, the notified polymer will be bound within the cured coating and will not be bioavailable.

6.2. Human Health Effects Assessment

No toxicological data were submitted.

Based on the high molecular weight (>1000 Da) of the notified polymer, the potential of the notified polymer to cross the gastrointestinal (GI) tract by passive diffusion or to be dermally absorbed is limited. However, the polymer contains a proportion of low molecular weight species (<1000 Da) that may be absorbed. In addition, absorption across the respiratory tract is possible.

The notified polymer contains a functional group that has been associated with irritation/corrosion and belongs to a class of chemicals with concerns for skin and respiratory sensitisation. While the potential for these effects may be limited by the high molecular weight (and structure) of the polymer, sensitisation and/or irritant effects cannot be ruled out, particularly due to the presence of low molecular weight species. In addition, the notified polymer contains a hazardous impurity/residual monomer at a concentration of < 5%, which may result in sensitisation by skin contact.

Health hazard classification

As no toxicity data were provided, the notified polymer cannot be classified according to the *Globally Harmonised System for the Classification and Labelling of Chemicals (GHS),* as adopted for industrial chemicals in Australia, or 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. However, due to the presence of a hazardous impurity/residual monomer, the notified polymer as imported (70% (w/w) in xylene) may cause skin sensitisation. In addition, sensitisation and/or irritant effects following exposure to the notified polymer, as imported (70% concentration) and in end-use products (≤ 25% concentration) cannot be ruled out. Therefore, steps should be taken to avoid exposure to the notified polymer.

Workers most at risk of exposure to the notified polymer (at up to 70% concentration) include workers involved in formulation processes and workers involved in applying the coating products. Workers may experience dermal and ocular exposure to the notified polymer (up to 70% concentration) during formulation processes and painting application. Inhalation exposure of workers to the notified polymer (≤ 25% concentration) may also occur during spray application. Therefore, spray application of coatings containing the notified polymer should take place in ventilated areas. In addition, the use of enclosed, automated processes should be implemented, where possible, and PPE (impervious gloves, goggles, coveralls and respiratory protection, if significant inhalation exposure is expected) should be worn by workers to minimise the potential for exposure to the notified polymer.

Therefore, provided that adequate control measures are in place to minimise worker exposure, including the use of automated processes and PPE, the risk to workers from the 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 surfaces that have been coated with coatings containing the notified polymer; however, once cured, the notified polymer will not be bioavailable. Therefore, when used in the proposed manner, the risk to public health from exposure to 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 not be manufactured in Australia and no release from this activity is expected. Environmental release may occur during importation, storage, transport and distribution due to accidental spills. In the event of a spill, the notified polymer is expected to be contained and collected with an inert material and be safely disposed of in accordance with local regulations.

At reformulation sites, the imported product containing the notified polymer will be mixed with other ingredients to produce a component of industrial coatings and repacked into 1 L, 4 L and 20 L end-use containers. Reformulation of the notified polymer will occur in a closed system and release to the atmosphere is expected to be negligible. Solvent used for equipment washing, that will contain residues of the notified polymer, is expected to be recycled for reuse on site or disposed of via accredited waste disposal contractors. Wastes and spills (1% of the annual import volume) created during reformulation activities are expected to be contained on-site and disposed of in accordance with local regulations. Empty import containers are expected to be drip dried and sent to an off-site drum reclaimer.

RELEASE OF CHEMICAL FROM USE

Formulations containing the notified polymer are likely to be applied by roller, brush or spray techniques to metal surfaces by industrial users. It is estimated from standard emission scenarios that up to 35% of the annual import volume of the notified polymer applied by spraying will be lost from overspray when applied to metal surfaces. The overspray is expected to be collected using standard engineering controls, where applicable. These losses, together with other wastes generated during use, including residues in application equipment washings and empty paint containers (estimated at up to 5% and 2.5%, respectively, of the annual import volume), are expected to be disposed of in accordance with local regulations, namely to landfill.

RELEASE OF CHEMICAL FROM DISPOSAL

The notified polymer used in coatings is expected to share the fate of the substrate to which it has been applied. The notified polymer in coatings applied to metal articles may be disposed of to landfill or thermally decomposed during metal reclamation processes at the end of the articles' useful life.

7.1.2. Environmental Fate

No environmental fate data were submitted. The majority of the notified polymer is expected to be bound within an inert matrix of cured coatings as part of its normal use pattern as a component in industrial coatings. The majority of notified polymer in wastes disposed of to landfill is expected to be in solid cured paint and it is not expected to be bioavailable, biodegradable nor mobile in this form. Based on the expected surface activity of the notified polymer, it is not likely to cross biological membranes, hence bioaccumulation is not expected. Furthermore, bioaccumulation of the notified polymer is unlikely due to its high molecular weight, limited bioavailability in its solid form in landfill and its limited release to surface waters. The notified polymer will eventually degrade in landfill or by thermal decomposition during metal reclamation processes, to form water and oxides of carbon and nitrogen.

7.1.3. Predicted Environmental Concentration (PEC)

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

7.2. Environmental Effects Assessment

No ecotoxicity data were submitted. The notified polymer contains basic functionality which has the potential to become cationic under environmental conditions (pH 4-9). The cationic charge density is <5000 Da and thus

the notified polymer has the potential to be toxic to aquatic life. However, significant exposure of the notified polymer to aquatic organisms is unlikely based on the reported use pattern. Furthermore, the majority of the notified polymer will be bound within the inert matrix of cured coatings and is not expected to be bioavailable.

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 reported 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 reported use pattern as a component of industrial coatings for use on metal substrates. The majority of the environmental release of the notified polymer will be as disposal of the cured coatings to landfill and by thermal decomposition during metal reclamation processes. In cured coatings, the notified polymer will be bound within an inert paint matrix and it is unlikely to leach or be bioavailable. On the basis of its limited aquatic exposure and assessed use pattern, the notified polymer is not expected to pose an unreasonable risk to the environment.

APPENDIX A: PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point 125 °C (Decomposed)

Method	OECD TG 103 Boiling Point.
Remarks	The Siwoloboff method was used. Decomposition began at 125 °C.
Test Facility	Investigative Science Inc. (2012)

Density 956.6 kg/m^3 at 22.5 °C

Method	OECD TG 109 Density of Liquids and Solids.
Remarks	Modified pycnometer method
Test Facility	Investigative Science Inc. (2012)

Water Solubility Water dispersible

Method	OECD TG 120 Solution/Extraction Behaviour of Polymers in Water
Remarks	Flask Method. Stable emulsion at 10 g/L formed at pH 2 and 7.
Test Facility	Investigative Science Inc. (2012)

BIBLIOGRAPHY

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