

File No: LTD/1922

September 2016

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

PUBLIC REPORT

Polymer in Chemlease Conc GNL

This Assessment has been compiled in accordance with the provisions of the *Industrial Chemicals (Notification and Assessment) Act 1989* (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 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 and Energy.

This Public Report is 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/1922	Chem-Trend Australia Pty Ltd	Polymer in Chemlease Conc GNL	ND*	≤ 1tonne per annum	Release agent in industrial moulding

*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 of 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

Provided that the recommended controls are being adhered to, 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 low expected aquatic release and the reported use pattern, the notified polymer is not considered to pose an unreasonable risk to the environment.

Recommendations

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 and its breakdown products:
 - Closed processes where possible
 - Good ventilation, preferably local exhaust ventilation
- A person conducting a business or undertaking at a workplace should implement the following safe work practices to minimise occupational exposure to the notified polymer and its breakdown products:
 - Avoid contact of uncured material with skin and eyes
 - Avoid inhalation of vapours/mist
- 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 and its breakdown products:
 - Impervious gloves, coveralls and eye protection
 - Respiratory protection if ventilation is not adequate to minimise exposure

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

- A person conducting a business or undertaking at a workplace should ensure that the Safe Work Australia exposure standard for the workplace for methanamine (CAS 74-89-5) of 13 mg/m³ (10ppm) time weighted average (TWA) is not exceeded.
- 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 of 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

- Where reuse or recycling are not appropriate, dispose of the notified polymer in an environmentally sound manner in accordance with relevant Commonwealth, state, territory and local government legislation.

Emergency procedures

- Spills or accidental release of the notified polymer should be handled by physical containment, collection and subsequent safe disposal. Emergency workers should wear appropriate personal protective equipment including respiratory protection when attending to spills.

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;
 - further information on methanamine release from the notified polymer becomes available.

or

- (2) Under Section 64(2) of the Act; if
 - the function or use of the polymer has changed from release agent in industrial moulding, or is likely to change significantly;
 - the amount of polymer being introduced has increased, 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 (M)SDS of the product containing the notified chemical 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

Chem-Trend Australia Pty Ltd (ABN: 90 107 400 019)
1st floor, 3 Brand Drive
THOMASTOWN VIC 3074

NOTIFICATION CATEGORY

Limited: Synthetic polymer with $M_n \geq 1,000$ 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, degree of purity, polymer constituents, residual monomers, impurities, additives/adjuvants, use details, import volume and identity of manufacturer/recipients.

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)

Variation to the schedule of data requirements is claimed as follows: all physico-chemical endpoints

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

None

NOTIFICATION IN OTHER COUNTRIES

None known

2. IDENTITY OF CHEMICAL

MARKETING NAME

Chemlease® Conc GNL (product containing the notified polymer)

MOLECULAR WEIGHT

> 10,000 Da

ANALYTICAL DATA

Reference GPC was provided.

3. COMPOSITION

DEGREE OF PURITY

> 90%

4. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AT 20 °C AND 101.3 kPa: amber coloured liquid (product)

Property	Value	Data Source/Justification
Melting Point/Freezing Point	Not determined	-
Boiling Point	Not determined	-
Density	0.78 kg/m ³	(M)SDS
Vapour Pressure	Not determined	-
Water Solubility	Not determined	Cannot be evaluated; expected to hydrolyse on contact with water
Hydrolysis as a Function of pH	Not determined	Cannot be evaluated; expected to hydrolyse on contact with water
Partition Coefficient (n-octanol/water)	Not determined	Cannot be evaluated; expected to hydrolyse on contact with water
Adsorption/Desorption	Not determined	Cannot be evaluated; expected to hydrolyse on contact with water
Dissociation Constant	Not determined	Expected to be ionised under environmental conditions (pH 4-9)

Flash Point	Not determined	-
Flammability	Not determined	-
Autoignition Temperature	Not determined	-
Explosive Properties	Not determined	Contains no functional groups that would imply explosive properties
Oxidising Properties	Not determined	Contains no functional groups that would imply oxidising properties

DISCUSSION OF PROPERTIES

The notified polymer is manufactured in hydrocarbon solvent and is not isolated until the end-use stage. The notified polymer will react with water and moisture in air, making it difficult to measure its physico-chemical properties.

Reactivity

The notified polymer is expected to be stable while dissolved in the hydrocarbon solvent; however it will react with water and with moisture in air. This reaction with water will lead to further polymerisation of the notified polymer and the expected release of methanamine (CAS No. 74-89-5) as a by-product. Information is not available on the speed of the reaction or the quantity of methanamine released.

Physical hazard classification

Based on the limited available physico-chemical information, the notified polymer is not recommended for hazard classification according to the *Globally Harmonised System of 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 not be manufactured in Australia. It will be imported in to Australia as a component of an end-use product at < 10% concentration.

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

Year	1	2	3	4	5
Tonnes	< 1	< 1	< 1	< 1	< 1

PORT OF ENTRY

Melbourne

TRANSPORTATION AND PACKAGING

The notified polymer will be imported by sea as a component of formulation or end-use product at < 10% concentration in 200 L closed head steel line drums. From the dock, the drums will be transported by road to the warehouse and/or site of use.

USE

The notified polymer will be used as a release agent during industrial moulding processes. It will be applied as a coating on mould surfaces to facilitate release of moulded parts.

OPERATION DESCRIPTION

The notified polymer may be diluted or reformulated prior to use, to facilitate spraying during the application process. If diluted/reformulated, the notified polymer will be charged to a mixing tank via drum spear inserted directly into the drum. Other additives will be added to the mixing tank and the components blended together and diluted. At the end of charging, the drum spear will be rinsed and the wash residues pumped to the mixing tank.

At the site of use, the notified polymer at < 10% concentration in hydrocarbon solvent will be applied to the surface of the mould either by manual or automated spray. The notifier advised that the spray process will take place in a closed-system with local exhaust ventilation. The notified polymer is expected to react with moisture in the air and to polymerise into a thin film, coating the mould surface.

At the end of its use cycle, the coated material containing the notified polymer will be removed from the mould surface using solvent and the surface will be wiped clean using cloths. The residues will be collected as hazardous waste and the cloths and solvents disposed of by a licensed waste disposal contractor.

6. HUMAN HEALTH IMPLICATIONS

6.1. Exposure Assessment

6.1.1. Occupational Exposure

CATEGORY OF WORKERS

<i>Category of Worker</i>	<i>Exposure Duration (hours/day)</i>	<i>Exposure Frequency (days/year)</i>
Transport and storage	1	30-60
Blending operators	2	50-100
Quality technicians	1	50-100
End use of releasing agents	1	100-200

EXPOSURE DETAILS

Transport and storage

Transport and storage workers are not expected to be exposed to the notified polymer except in the unlikely event of an accident. Spillage could result in release of methanamine.

Reformulation

During reformulation and / or dilution, dermal and ocular exposure to the notified polymer at < 10% concentration may occur during the transfer into the blending machine and cleaning and maintenance of blending equipment.

End-use

Industrial end use workers may be exposed to the notified polymer via the dermal and ocular routes during application of the notified polymer on the mould surface, during the moulding process, handling the moulded products and cleaning of the mould surface. Inhalation exposure may also occur during spray processes.

During application, upon contact with moisture in air, the notified polymer is expected to further polymerise, releasing methanamine in gaseous form. The amount of methanamine released during application and curing of the notified polymer will depend of the scale of application. Workers may have inhalation as well as dermal/ocular exposure to this material.

The notifier advised that control measures such as use of enclosed systems with local exhaust ventilation and personal protective equipment (PPE) including impervious gloves, coveralls and respiratory protection if required will be used to reduce exposure to the notified polymer and methanamine released during curing of the notified polymer.

6.1.2. Public Exposure

The notified polymer will not be used by the public. The public may come in contact with moulded products which may contain trace amount of the notified polymer on surface. The trace amount of polymer on the surface of the moulded products is expected to be cured and not bioavailable.

6.2. Human Health Effects Assessment

No information on the toxicity of the notified polymer is available.

The notified polymer is expected to react when exposed to water or moisture in air, polymerising further. Methanamine (CAS No. 74-89-5; also known as methylamine or mono-methylamine) is expected to be released as a by-product. It is listed on the Safework Australia Hazardous Chemicals Information System (HCIS) with the following hazard classifications:

Flammable gas – Category 1

Acute toxicity – Category 4

Specific target organ toxicity (Single exposure) – Category 3

Eye Damage – Category 1

The following hazard statements apply:

- H220 – Extremely flammable gas
- H332 – Harmful if inhaled
- H335 – May cause respiratory irritation
- H315 – Causes skin irritation
- H318 – Causes serious eye damage

Health hazard classification

As no toxicity data were provided, the notified polymer cannot be classified according to the *Globally Harmonised System of 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

The hazard of the notified polymer is not known. During application of the product containing the notified polymer, the hazardous and flammable chemical methanamine is expected to be released, however the amount released and the speed of release are not known. Contact with the notified polymer has the potential to lead to irritation, including from contact with the released methanamine. The highest potential exposure to the notified polymer and risk associated would be during spray application of the notified polymer to mould surfaces and clean-up of large accidental spills.

The amount of methanamine released during the coating / curing process and the consequent potential worker exposure would vary depending on the application method, the scale of the process and environmental conditions. Use of engineering controls such as enclosed systems and exhaust ventilation, safe work practices and PPE such as impervious gloves, coveralls, goggles and respiratory protection would mitigate the exposure to both the notified polymer and released methanamine. The workplace controls should be chosen on the basis of the particular scenario, ensuring that methanamine levels stay below the Australian exposure standard for the workplace of 13 mg/m³ (10ppm) time weighted average (TWA).

Accidental spillage of the product containing the notified polymer could lead to unplanned release of methanamine, potentially in larger quantities than would occur during normal application procedures. Appropriate procedures and PPE would prevent adverse effects to workers responding to the accidental release.

Overall, provided engineering controls, safe work practices and PPE are used to reduce exposure, the risk to workers is not considered to be unreasonable.

6.3.2. Public Health

The notified polymer is for industrial use only. The public will not come into contact with the notified polymer but may come into contact with moulded articles containing trace amounts of the notified polymer. By this time the polymer will be cured and will not be bioavailable. Therefore the risk to the public 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 as a component of a solution for reformulation or dilution into a finished release agent for moulded parts. There is unlikely to be any significant release to the environment from transport and storage, except in the case of accidental spills and leaks. In the event of spills, the product containing the notified polymer is expected to be collected with adsorbents, and disposed of to landfill in accordance with local government regulations.

The reformulation or dilution process will involve charging the product containing the notified polymer from import containers into enclosed mixing vessels and blending with other components or diluent. Wastes containing the notified polymer generated during reformulation or dilution include equipment cleaning solvent, residues in import containers and spilt materials. It is estimated by the notifier that 1-2% of the import volume of the notified polymer (or up to 20 kg) may be released to the environment as a result of reformulation or dilution processes. These are expected to be collected and disposed of to landfill in accordance with local government regulations. Empty import containers are expected to be recycled or disposed of through licensed waste management services.

RELEASE OF CHEMICAL FROM USE

The product containing the notified polymer will be used as a mould release agent for moulded parts, and is expected to be used within an enclosed system due to the reactivity of the notified polymer with water. The product containing the notified polymer will be applied onto mould surfaces using spray techniques. Once cured, the notified polymer will be irreversibly bound within an inert polymer matrix on the mould surface. Mould surfaces are expected to be periodically cleaned with solvents before reapplication of the mould release agent. Equipment cleaning wastes are expected to be collected for disposal to landfill in accordance with local government regulations. Empty containers are expected to be recycled or disposed of through licensed waste management services.

RELEASE OF CHEMICAL FROM DISPOSAL

The majority of the notified polymer in the mould release agent will be cured within an inert polymer matrix on the surface of the moulds to which it is applied. Mould surfaces will be cleaned with solvents, with the cleaning solvent containing residues of the notified polymer to be collected and disposed of to landfill or by licensed trade waste management services, in accordance with local government regulations. A minor amount of the notified polymer may be bound to the surfaces of moulded parts, and is expected to share the fate of the moulded parts to which it is adhered. These are predominantly expected to be disposed of to landfill at the end of their useful life.

7.1.2. Environmental Fate

No environmental fate data were submitted for the notified polymer. The notified polymer is expected to be cured within an inert polymer matrix on the surface of the moulds, and will be removed and disposed of with cleaning solvents. Once cured, the notified polymer will not be mobile, bioavailable or bioaccumulative. A minor amount of the notified polymer may be bound to the surface of moulded parts, and is expected to share the fate of the moulded parts. At the end of their useful life, moulded parts containing the notified polymer will eventually be disposed of to landfill. The notified polymer is also expected to enter landfill as collected wastes and residues. Based on its reactivity with water, the notified polymer is expected to hydrolyse upon contact with water and is not expected to be bioavailable. The notified polymer is not expected to cross biological membranes and be bioaccumulative, based on its high molecular weight. In landfill, the notified polymer is expected to eventually degrade by biotic and abiotic processes to form water and oxides of carbon, silicon and nitrogen.

7.1.3. Predicted Environmental Concentration (PEC)

As significant aquatic exposure is not expected at any stage of the notified polymer's life-cycle, the predicted environmental concentration (PEC) has not been calculated.

7.2. Environmental Effects Assessment

No ecotoxicity data were submitted for the notified polymer. Ecotoxicological endpoints for the notified polymer were calculated based on ecological structure activity relationship (ECOSAR v1.11; US EPA, 2012) equations. The acute and chronic endpoints are summarised in the table below.

<i>Endpoint</i>	<i>Result</i>	<i>Assessment Conclusion</i>
<u><i>Acute Toxicity</i></u>		
Fish	96 h LC50 = 128.70 mg/L	Not predicted to be harmful to fish (acute)
Daphnia	48 h EC50 = 11 mg/L	Predicted to be harmful to aquatic invertebrates (acute)
Algae	96 h EC50 = 4.4 mg/L	Predicted to be toxic to algae (acute)
<u><i>Chronic Toxicity</i></u>		
Fish	ChV = 7.15 mg/L	Not predicted to be harmful to fish (chronic)
Daphnia	ChV = 0.61 mg/L	Predicted to be toxic to aquatic invertebrates (chronic)
Algae	ChV = 2.2 mg/L	Not predicted to be harmful to algae (chronic)

The notified polymer is predicted to be toxic to algae and harmful to aquatic invertebrates on an acute basis, and is predicted to be toxic to aquatic invertebrates on a chronic basis. It is not predicted to be harmful to fish on an

acute basis, and it is not predicted to be harmful to fish or algae on a chronic basis. The ECOSAR estimation procedure used here is a standard approach, and is considered reliable to provide general indications of the likely environmental effects of a chemical. However, this method is not considered sufficient to formally classify the acute and chronic hazards of the notified polymer to aquatic life under the Globally Harmonised System of Classification and Labelling of Chemicals (GHS) (United Nations, 2009).

7.2.1. Predicted No-Effect Concentration

The predicted no-effect concentration (PNEC) for the aquatic compartment has not been calculated. Although the notified polymer is predicted to be both acutely and chronically toxic to aquatic life, it is expected to hydrolyse upon contact with water and is not expected to be bioavailable. Furthermore, based on the reported use pattern, no ecotoxicologically significant release of the notified polymer to the aquatic environment is expected.

7.3. Environmental Risk Assessment

The risk quotient ($Q = \text{PEC}/\text{PNEC}$) of the notified polymer has not been calculated since neither the PEC nor PNEC are available, and due to the low potential for release of the notified polymer to the aquatic compartment. The notified polymer is expected to hydrolyse in the environment, and is expected to have a low potential for bioaccumulation. On the basis of the low annual importation volume, low expected aquatic release and assessed use pattern as a release agent for moulded parts, the notified polymer is not expected to pose an unreasonable risk to the environment.

BIBLIOGRAPHY

NOHSC (2004) Approved Criteria for Classifying Hazardous Substances, 3rd edition [NOHSC:1008(2004)]. National Occupational Health and Safety Commission, Canberra, AusInfo.

HCIS – Hazardous chemical information system Accessed August 2016 at <<http://hcis.safeworkaustralia.gov.au/HazardousChemical/Details?chemicalID=3083>>.

United Nations (2009) Globally Harmonised System of Classification and Labelling of Chemicals (GHS), 3rd revised edition. United Nations Economic Commission for Europe (UN/ECE), <http://www.unece.org/trans/danger/publi/ghs/ghs_rev03/03files_e.html>.