

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

POLYMER OF LOW CONCERN PUBLIC REPORT

Polymer in Irganox® L 77

This Assessment has been compiled in accordance with the provisions of the *Industrial Chemicals (Notification and Assessment) Act 1989* (the Act) and Regulations. The National Industrial Chemicals Notification and Assessment Scheme (NICNAS) is administered by the Australian Government 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 Australian Government 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 SUBSTANCE	INTRODUCTION VOLUME	USE
PLC/1564	BASF Australia Ltd	Polymer in Irganox® L 77	No	< 20 tonnes per annum	Component of lubricant

CONCLUSIONS AND REGULATORY OBLIGATIONS

Human Health Risk Assessment

Based on the assumed low hazard and the assessed use pattern, the notified polymer is not considered to pose an unreasonable risk to the health of workers and the public.

Environmental Risk Assessment

Based on the assumed low hazard and the assessed use pattern, the notified polymer is not considered to pose an unreasonable risk to the environment.

Health and Safety Recommendations

- 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 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

- Prevent from entering into soil, ditches, sewers, waterways and/or groundwater.
- Spills and/or accidental release of the notified polymer should be handled by physical containment, collection and subsequent safe disposal.

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 polymer 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 component of lubricants, or is likely to change significantly;
 - the amount of notified polymer being introduced has increased, or is likely to increase, significantly;
 - 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 notified 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.

Safety Data Sheet

The SDS of the product containing the notified polymer was provided by the applicant. The accuracy of the information on the SDS remains the responsibility of the applicant.

ASSESSMENT DETAILS

1. APPLICANT AND NOTIFICATION DETAILS

Applicants

BASF Australia Ltd (ABN: 62 008 437 867)
Level 12, 28 Freshwater Place
SOUTHBANK VIC 3006

Exempt Information (Section 75 of the Act)

Data items and details exempt from publication include: chemical name, other names, CAS number, molecular and structural formulae, molecular weight, polymer constituents, residual monomers/impurities and import volume.

2. IDENTITY OF POLYMER

Marketing Name(s)

Irganox® L 77 (containing the notified polymer at 50% concentration)

Molecular Weight

Number Average Molecular Weight (Mn) is > 1,000 g/mol.

3. PLC CRITERIA JUSTIFICATION

<i>Criterion</i>	<i>Criterion met</i>
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

Appearance at 20 °C and 101.3 kPa	Red-brown powder with amine odour
Melting Point/Glass Transition Temperature	> 70 °C
Density	900 kg/m ³ at 20 °C
Water Solubility	< 1.2 × 10 ⁻³ g/L at 20 °C
Dissociation Constant	The notified polymer does not contain dissociable functionalities.
Particle Size	Not applicable as the polymer is imported in solution and not isolated.
Reactivity	Stable under normal environmental conditions
Degradation Products	None under normal conditions of use

5. INTRODUCTION AND USE INFORMATION

Maximum Introduction Volume of Notified Chemical (100%) Over Next 5 Years

<i>Year</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
Tonnes	< 2	< 10	< 20	< 20	< 20

Use

The notified polymer will be imported at 50% concentration in product solution or at < 2% concentration in lubricant formulations. The imported product containing the notified polymer at 50% concentration will be reformulated with base oils and other additives to make lubricant formulations containing the notified polymer at < 2% concentration. The lubricant formulations will be used by industrial users and the public. The types of lubricants are expected to be engine oils (50%), mineral oil based industrial lubricants (25%) and synthetic industrial lubricants and grease (25%).

6. HUMAN HEALTH RISK ASSESSMENT

No toxicological data were submitted. The notified polymer meets the PLC criteria and is therefore assumed to be of low hazard. The risk of the notified polymer to occupational and public health is not considered to be unreasonable given the assumed low hazard and the assessed use pattern.

Although not considered in this risk assessment, NICNAS notes that the notified polymer contains residual monomers that are classified as hazardous according to the *Globally Harmonised System of Classification and Labelling of Chemicals (GHS)*, as adopted for industrial chemicals in Australia.

7. ENVIRONMENTAL RISK ASSESSMENT

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

Release of the notified polymer to the aquatic environment is not expected during reformulation as the reformulation processes are largely automated and spills and residues in import containers will be readily contained and collected for disposal to landfill.

The notifier has indicated that 50% of the annual import volume will be used in engine oils. In an Australian survey it was found that only 4% of households disposed of motor oil and that approximately 30% was incorrectly disposed of (Aither, 2013). Some vehicle lubricating oil is consumed during use but this is highly variable (between 0 and 99%), depending on the type of oil and its use. Although there is some uncertainty, based on this data, it may be estimated that approximately 1% ($4\% \times 30\%$) of all motor oil sold could be incorrectly disposed of by DIY users. Therefore, in a worst case scenario, it is assumed that 0.5% of the annual import volume (1% of 50%) will be incorrectly disposed of to the sewer, drains, or ground by DIY users. Assuming the releases occur nationwide over the entire year and there is no removal of the notified polymer during wastewater treatment, the predicted environmental concentration (PEC) is estimated to be $0.06 \mu\text{g/L}$ [$(20 \text{ tonnes per annum} \times 0.005) \div (24.386 \text{ million persons} \times 200 \text{ L/day} \times 365 \text{ days per annum})$]. Therefore, the notified polymer is not expected to be released to surface waters at ecotoxicologically significant concentrations.

The remaining 50% of the annual import volume is expected to be used in other lubricants and grease. Releases of the notified polymer during its use in lubricating oils are not expected to be significant (OECD, 2004). Grease and rust prevention products containing the notified polymer are designed to be applied to articles and release from this use application is also expected to be minimal.

Each application of the notified polymer is expected to be associated with minimal aquatic release. Used lubricant oils and fluids containing the notified polymer are expected to be recycled, re-refined or disposed of by approved waste management facilities. Greases containing the notified polymer are expected to remain attached to the articles to which they are applied. The majority of the notified polymer is therefore expected to be degraded by incineration or decomposed during metal recycling processes or ultimately, to end up in landfill along with the articles to which it has been applied. In landfill the notified polymer is expected to be immobile based on its low water solubility and the fact that it is expected to adsorb to soil. The notified polymer may potentially be persistent in the environment

because it contains branched chains; however, it is expected to eventually degrade into water and oxides of carbon and nitrogen via biotic and abiotic pathways.

BIBLIOGRAPHY

Aither (2013) Third Independent Review of the Product Stewardship (Oil) Act 2000. Canberra, Australia.

OECD. (2004). Emission Scenario Document on Lubricants and Lubricant Additives: Document No. 10. OECD. Retrieved from <http://www.oecd.org/env/ehs/risk-assessment/emissionscenariodocuments.htm>