File No PLC/1305

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

**POLYMER OF LOW CONCERN PUBLIC REPORT**

**Polymer in Z-163**

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.

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**


October 2015

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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/1305 | Lubrizol International Inc | Polymer in Z-163 | No | ≤ 100 tonnes per annum | Component of coatings |

## 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.

- If aerosols are formed during the use of the notified polymer, engineering controls and respiratory protection should be used to prevent inhalation exposure.

- A copy of the (M)SDS should be easily accessible to employees.

- Spray applications should be carried out in accordance with the Safe Work Australia Code of Practice for *Spray Painting and Powder Coating* (Safe Work Australia, 2012) or relevant State or Territory Code of Practice.

- 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 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 a component of coatings, 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.

**(Material) Safety Data Sheet**

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

# ASSESSMENT DETAILS

## 1. APPLICANT AND NOTIFICATION DETAILS

**Applicants**
Lubrizol International Inc (ABN: 52 073 495 603)
28 River Street
Silverwater NSW 2128

**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 and import volume.

## 2. IDENTITY OF POLYMER

**Marketing Name(s)**
Z-163 (contains < 40% notified polymer)

**Molecular Weight**
Number Average Molecular Weight (Mn) is > 10,000 Da.

## 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

| | |
|---|---|
| Appearance at 20 °C and 101.3 kPa | Off-white liquid* |
| Melting Point/Glass Transition Temp | Not determined |
| Density | 1,000 -1,100 kg/m$^3$ at 20 °C* |
| Water Solubility | Dispersible |
| Dissociation Constant | Not determined. The notified polymer is expected to be ionised in the environment due to the presence of ionic moieties. |
| Reactivity | Stable under normal environmental conditions |
| Degradation Products | None under normal conditions of use |

*For the notified polymer at < 40% concentration in aqueous solution

## 5. INTRODUCTION AND USE INFORMATION

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

| *Year* | *1* | *2* | *3* | *4* | *5* |
|---|---|---|---|---|---|
| Tonnes | 20-25 | 30-35 | 40-50 | 60-75 | 75-100 |

**Use**
The notified polymer will not be manufactured in Australia and will be imported either (1) as manufactured (< 40% concentration in aqueous solution) for reformulation into end-use coatings for wood; or (2) as a component (at 8-9% concentration) of end-use coatings for wood. The coatings will be primarily used by professionals, although use by Do-It-Yourself (DIY) consumers will also be possible. The coatings will be applied by roller, brush or via spray.

## 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 notified polymer is a high molecular weight polymer (> 70,000 Da) with low water solubility. Inhalation of polymers with molecular weights > 70,000 Da has been linked with irreversible lung damage due to lung overloading and impaired clearance of particles from the lung, particularly following repeated exposure. If the notified polymer is inhaled at low levels and/or infrequently, it is assumed that it will be cleared from the lungs.

**Occupational Health and Safety Risk Assessment**
The notified polymer will be introduced either as manufactured (as a liquid) for reformulation into a liquid coating formulation or as a component of a liquid coating formulation; hence inhalation exposure is not expected during reformation and application by roller and brush. Inhalation exposure is possible in spray applications; however, workers are expected to use appropriate engineering controls and personal protective equipment (PPE) to limit exposure.

Therefore, given the assumed low hazard and the assessed use pattern, the risk of the notified polymer to occupational health and safety is not considered to be unreasonable.

**Public Health and Safety Risk Assessment**
Do it yourself (DIY) consumers may also use coatings containing the notified polymer. Given the assumed low hazard of the notified polymer, infrequency of use by DIY consumers and low concentration of the notified polymer in coatings, the risk of the notified polymer to public health is not considered to be unreasonable.

## 7. ENVIRONMENTAL RISK ASSESSMENT

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 and it is therefore not considered to be an over-chelation hazard to algae. The notified polymer also contains potentially cationic functionality, however the cationic charge density is low and the notified polymer is therefore not expected to be of concern to the aquatic environment.

The notified polymer will be imported into Australia as a component (31.15%) of a water based dispersion solution. It will be reformulated as a binder in wood coatings primarily for professional painters in commercial settings (90%) and in Do-It-Yourself applications (< 5%). The notified polymer is expected to cross-link with an acrylic copolymer that cures as the wet film dries. During reformulation, the notified polymer will be pumped from the drum to a blending tank. This procedure will be automated or semi-automated. Release of the notified polymer from accidental spills is estimated to be 0.1% of the import volume. Spills will be contained and soaked up with inert material (sand, silt, vermiculite etc) and disposed of to landfill. Reformulation wastes from cleaning of equipment and container residues containing the notified polymer (< 1%) are expected to be sent to a licensed waste facility for disposal in accordance with local, State and Federal regulations. During application of the

coating, release to the environment may occur from residues in empty containers (< 5%), spills (< 1%) and from cleaning of equipment (< 1%). The majority of the release will be in the form of polymer adsorbed onto wood. Brushes and rollers will be cleaned by wiping them on newspaper followed by rinsing in water. The used newspaper and any drop sheets, cleaning cloths or rags will be disposed of to landfill. Residues in empty containers and spills (collected using inert material) are expected to be disposed of to landfill. As a worst case scenario it is assumed that 5% of the notified polymer from cleaning of equipment will be released to sewers. Assuming 0% of the notified polymer will be removed via absorption to sludge in the sewage treatment plant, the resultant predicted environmental concentration (PEC) in sewage effluent on a nationwide basis is estimated as 4.25 µg/L [PECriver = 19.23 kg notified polymer/day ÷ (200 L/person/day × 22.613 million people) × 1 (dilution factor)]. The PEC is well below the EC50 for algae of the most toxic anionic polymers (EC50 > 1 mg/L).

Once cured, the coatings containing the notified polymer will form an inert polymer matrix, and the incorporated notified polymer will not be bioavailable. Discarded end use articles containing the notified polymer are expected to be disposed of to landfill, or subjected to combustion which will entail thermal decomposition of the coating to form water vapour and oxides of carbon and nitrogen. In landfill, the notified polymer is not expected to be mobile or bioavailable and will eventually degrade by abiotic and biotic processes to water, methane, oxides of carbon and nitrogen. The notified polymer is not expected to be readily biodegradable, but bioaccumulation is not likely based on its high molecular weight. Therefore, the notified polymer is not considered to pose an unreasonable risk to the aquatic environment based on its assessed use pattern.