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

FULL PUBLIC REPORT

Z-53

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**Director
Chemicals Notification and Assessment**

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Z-53**1. APPLICANT AND NOTIFICATION DETAILS**

APPLICANT(S)

Lubrizol International Inc

NOTIFICATION CATEGORY

Synthetic Polymer of Low Concern

EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication:

Chemical name

Other names

CAS number

Molecular formula

Structural formula

Polymer constituents

Import volume

Details of use

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)

Variation to the schedule of data requirements is claimed as follows:

Particle size distribution (The notified polymer is a liquid, test not applicable)

Flammability Limits (This test is usually performed on powder or paste-like materials, therefore not applicable).

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

No

NOTIFICATION IN OTHER COUNTRIES

Yes, Korea in 2001

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

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3. COMPOSITION

ADDITIVES/ADJUVANTS

<i>Chemical Name</i>	Mineral Oil		
<i>CAS No.</i>	Not known	<i>Weight %</i>	20-25

PLC CRITERIA JUSTIFICATION

<i>Criterion</i>	<i>Criterion met (yes/no/not applicable)</i>
Meets Molecular Weight Requirements	Yes
Meets Functional Group Equivalent Weight (FGEW) Requirements	Yes
Low Charge Density	Yes
Approved Elements Only	Yes
No Substantial Degradability	Yes
Water Absorbing	Yes
Low Concentrations of Residual Monomers	Yes

Hazard Substance or Dangerous Good

Yes

The notified polymer meets the PLC criteria.

4. 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>
<i>Tonnes</i>	30-100	30-100	30-100	30-100	30-100

USE

The notified polymer is used as a pour point depressant in lubricants, primarily engine oils.

5. PROCESS AND RELEASE INFORMATION

5.1. Operation Description

The notified polymer is not manufactured in Australia; it will be imported in via 200L drums or isotainers containing the notified polymer in 20-25% mineral oil, then distributed to at least 6 customers in Sydney, Melbourne, Brisbane and Perth.

Formulation

The notified polymer will be blended with other engine oil additives or diluents to produce the final product. Such fluids are expected to contain <1% notified polymer.

Although the formulation process may vary from customer to customer, a typical blending process is expected to be highly automated using dedicated tanks and transfer lines where feasible. The blend operation would last approximately 8-10 hours and require minimal supervision by 1-2 workers. After blending the final fluid will be transferred to appropriate packaging and transported to customers throughout Australia. Again, it is expected that the transfer and packaging would be a highly automated process utilizing appropriate engineering controls. Workers involved in the blending process are expected to wear appropriate PPE such as nitrile gloves, face shields or goggles and long sleeve shirts.

Drums used to transport the notified polymer may be flushed with mineral oil that would then likely be added to the blend. Drums are expected to be sent to a reconditioning facility for reuse.

End Use

There is a variety of uses for fluids containing the notified polymer, including motor oils. These may be used, by large and small facilities, for factory fill and oil change at retail stores or by the general public for 'do-it yourself' applications.

6. EXPOSURE INFORMATION

6.1. Summary of Environmental Exposure

Release of Polymer during Formulation

Products containing the notified polymer will be imported to customers in Australia directly. These will add a calculated amount of the product containing the polymer to the engine oil formulation that would yield an effective treat rate of <1% by weight of the notified polymer. A typical operation would involve pumping the polymer containing product directly from an isotainer or 200L drum to a blend tank where it will be blended with mineral oil and other additives. All these operations are expected to be carried out automatically or semi-automatically in a closed system. Diluent oil is used to flush the isotainer or drum and the flushings are added to the blend. Residual product remaining in the container are expected to be small (approximately 1%) and are easily removed by washing with mineral oil and disposed of at a reconditioning facility or incinerated.

Release of Polymer during Use

There will be some losses on adding oil to vehicles, but the greatest potential for exposure is through

disposal of oil product wastes containing the notified polymer. A survey by the Australian Institute of Petroleum (AIP 1995) indicates that of the annual sales of automotive engine oils in Australia, some 60% are potentially recoverable (i.e. not burnt in the engines during use). This report also indicates that around 86% of oil changes take place in specialised automotive service centres, where old oil drained from crankcases could be expected to be disposed of responsibly - either to oil recycling or incineration. The remaining 14% are removed by "do it yourself" (DIY) enthusiasts, and in these cases some of the used oil would be either incinerated, left at transfer stations where it is again likely to be recycled, or deposited into landfill. A recent report estimated that DIY activities account for between 7 to 10% of the unaccounted used oil (MEINHARDT 2002).

According to a survey tracing the fate of used lubricating oil in Australia (Snow 1997) only around 20% of used oil removed by enthusiasts is collected for recycling, approximately 25% is buried or disposed of in landfill, 5% is disposed of into stormwater drains and the remaining 50% is used in treating fence posts, killing grass and weeds or disposed of, in other ways.

Consequently, assuming that oil removed by professional mechanics is disposed of appropriately (i.e. burning as workshop heating oil or sent for recycling), negligible release of the notified polymer should result from these professional activities. Assuming a worst case scenario of 14% of the used oil removed by the DIY enthusiasts it is possible to have 20, 25, 5 and 50% of this oil to be collected for recycling, buried or disposed of in landfill, and disposed into stormwater drains and used in treating fence posts, to kill weeds or disposed of in other ways, respectively.

Therefore, an amount less than 1% of the total import volume of the notified polymer could be expected to enter the aquatic environment via disposal into the storm water system. Since the use of the oil products will occur throughout Australia, release from use or disposal will be very diffuse.

6.2. Summary of Occupational Exposure

During transport and storage, workers are unlikely to be exposed to the notified polymer except when packaging is accidentally breached.

Dermal and ocular exposure can occur during certain formulation processes. However, exposure to significant amounts of the notified polymer is limited because of the engineering controls and personal protective equipment worn by workers.

Incidental skin contact is also identified for workers involved in the reconditioning of drums. However, the amount of notified polymer is expected to be low due to rinsing and personal protective equipment will be worn, thus minimising any dermal exposure.

Exposure to engine oils and/or lubricants can be high during addition or replacement but exposure to the notified polymer will be low given its low concentration (< 1%) in the oils or fluids. Workers will typically wear overalls but will not necessarily wear gloves or eye protection.

6.3. Summary of Public Exposure

The notified polymer will not be sold to the public except as a component of the final lubricant/engine oil. These consumers would typically be automotive do-it-yourselfers or anyone who changes their own oil. These users may be dermally exposed to the notified polymer, which is present at a concentration of <1% in the finished oil, if they come into contact with spills or runs or drips on the outside of the container after filling.

7. PHYSICAL AND CHEMICAL PROPERTIES

Test reports were provided for the following physico-chemical properties: Pour Point, Boiling Temperature, Water Solubility and Density (SafePharm, 2003a) and Autoignition temperature (SafePharm, 2003b).

Appearance at 20°C and 101.3 kPa
Melting and Boiling Point

Orange-yellow liquid
No boiling temperature could be determined as the notified polymer decomposed from 180.85 °C. Estimated to be >360 °C.

Pour Point	0.85+/-3 °C
Density	855 kg/m ³ at 20 °C
Water Solubility	<4.13 x 10 ⁻⁴ g/L at 20° C (determined by GPC). The flask method (OECD TG 105) was used. 0.1343 g of test substance was added to double distilled water, pH 7, shaken at 30° C and after standing at 20° C for 24 hours was centrifuged. The supernatant was analysed by GPC.
Viscosity	500 Centistokes at 100 °C
Dissociation Constant	The polymer does not contain any functional groups that will readily dissociate.
Autoignition Temperature	>400 °C
Reactivity	Stable under normal environmental conditions. Initial decomposition occurs at 180.85°C. The majority of the material decomposes at 390°C. Under extreme oxidation conditions the notified polymer can be oxidised.
Degradation Products	Oxides of carbon, aldehydes and other products of incomplete combustion.

8. HUMAN HEALTH IMPLICATIONS

8.1. Toxicology

No toxicological data were submitted.

The notifier's MSDS provides the following information based on data from similar poly alpha olefin polymers.

Oral LD50 in rat: >5000mg/kg bw.

Dermal LD50 in rabbit: >2000 mg/kg bw.

Eye Irritation: May cause eye irritation. Does not meet EU R36 criteria.

Skin Irritation: Not expected to be primary irritant. Prolonged or repeated contact may cause dermatitis.

Respiratory Irritation: If material is misted or vapours are generated from heating, exposure may cause irritation of mucous membranes and the upper respiratory tract similar to that observed with mineral oil.

Dermal Sensitisation: Not expected to cause skin sensitisation.

Inhalation sensitisation: Not expected to cause respiratory tract sensitisation.

8.2. Human Health Hazard Assessment

The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard. In the literature, this class of compound is reported to be not toxic.

From data provided for similar materials and due to the impurities present, exposure to the notified polymer may cause eye and skin irritation and if the material is misted or vapours generated from heating, exposure may cause irritation of mucous membranes and the upper respiratory tract.

9. ENVIRONMENTAL HAZARDS

9.1. Ecotoxicology

No toxicological data were submitted.

9.2. Environmental Hazard Assessment

Polynonionic polymers which have MW > 1000 are generally of low concern (Nabholz et al., 1993).

10. RISK ASSESSMENT

10.1. Environment

The main environmental exposure is expected to result from inappropriate disposal of waste lubricant product by DIY enthusiasts, which will be however, widespread across Australia. Most of the improperly released notified polymer due to DIY activities is likely to become

associated with soils or sediments, as will the notified polymer released to landfill including as container residues. Incineration of waste polymer will generate water vapour and oxides of carbon.

The amount released to stormwater drains (less than 1% of the import volume) and enters the aquatic compartment could also be expected to become associated with suspended organic material, settle out into the sediments and slowly degrade due to the biotic and abiotic processes.

It is difficult to estimate the Predicted Environmental Concentration (PEC) of the notified polymer released into the stormwater drains, which have the potential to directly enter the aquatic environment. However, a worst case estimated PEC might be calculated if it is assumed that all of the 1% of the notified polymer (i.e. 1 tonne) expected to be released into the stormwater drains in a single metropolitan area with a geographical footprint of 500 square kilometres, an average annual rainfall of 50 cm. With a maximum annual release into this localised stormwater system of 1 tonne and the annual volume of water drained from this region estimated to be approximately $250 \times 10^6 \text{ m}^3$, the resultant PEC is approximately $4.0 \text{ } \mu\text{g/L}$. It should be stressed that this result is very much a worst case scenario, furthermore, that in reality releases of the chemical would be very much more diffuse than indicated here, and also at significantly reduced levels.

Since no ecotoxicological data were provided a risk quotient ($\text{RQ} = \text{PEC}/\text{PNEC}$) cannot be calculated. However based on the use pattern of the notified polymer, it is not expected to pose an unacceptable risk. Given the above, environmental exposure and the overall environmental risk is expected to be low.

10.2. Occupational health and safety

Exposure to the notified polymer may cause eye and skin irritation and if the material is misted or vapours generated from heating, exposure may cause irritation of mucous membranes and the upper respiratory tract. Exposure to the notified polymer during formulation is expected to be limited by the use of engineering controls and PPE. Exposure to the notified polymer after formulation is expected to be low as the notified polymer is only present at a concentration of <1%. Overall, the OHS risk presented by the notified polymer is expected to be low.

10.3. Public health

The notified polymer will be available to the public at low concentrations (<1 %) in lubricants/engine oils. The public health risk from the notified polymer is expected to be low due to the expected low toxicity, low concentration and the fact that engine oil is changed infrequently.

11. CONCLUSIONS – ASSESSMENT LEVEL OF CONCERN FOR THE ENVIRONMENT AND HUMANS

11.1. Environmental risk assessment

The polymer is not considered to pose a risk to the environment based on its reported use pattern.

11.2. Human health risk assessment

11.2.1. Occupational health and safety

There is Low Concern to occupational health and safety under the conditions of the occupational settings described.

11.2.2 Public health

There is Low Concern to public health when used in proposed manner.

12. MATERIAL SAFETY DATA SHEET

Material Safety Data Sheet

The notifier has provided MSDS as part of the notification statement. The accuracy of the information on the MSDS remains the responsibility of the applicant.

13. RECOMMENDATIONS

CONTROL MEASURES

Occupational Health and Safety

- Employers should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified polymer as introduced:
 - Protective eyewear, protective clothing and impermeable gloves.
 - Guidance in selection of personal protective equipment can be obtained from Australian, Australian/New Zealand or other approved standards.
- Employers should implement the following engineering controls to minimise occupational exposure to the notified polymer as introduced:
 - If use generates a mist or vapour, local exhaust ventilation is recommended.
- 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 NOHSC *Approved Criteria for Classifying Hazardous Substances*, workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation must be in operation.

Disposal

- The notified polymer will be a component of waste oil. It should be disposed of by recycling as waste oil or incinerated in accordance with approved State or Territory waste management regulations. Emptied containers (1-4 L) should be sent to landfill for disposal. Emptied drums should be sent to drum recyclers for steam cleaning prior to re-use, with wastewater treated and oil component concentrated prior to recycling as waste oil by licensed waste contractors. Every effort should be made to prevent the notified polymer from entering waterways.

Emergency procedures

- Spills/release of the notified polymer should be handled by stopping the source of the spill where possible, then containing the release to prevent further contamination of soil, surface water or ground water. Clean up spill as soon as possible by applying non-combustible adsorbent materials in disposable containers and dispose of in a manner consistent with government regulations.

13.1. Secondary notification

The Director of Chemicals Notification and Assessment must be notified in writing within 28 days by the notifier, other importer or manufacturer:

- (1) Under subsection 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 subsection 64(2) of the Act:

- if any of the circumstances listed in the subsection arise.

The Director will then decide whether secondary notification is required.

No additional secondary notification conditions are stipulated.

14. REFERENCES

AIP (1995) AIP Survey of Used Oil. Australian Institute of Petroleum Ltd.

MEINHARDT (2002) Used Oil in Australia. Prepared by MEINHARDT Infrastructure & Environment Group for Environment Australia.

Nabholz J V, Miller P and Zeeman M (1993), Environmental Risk Assessment of New Chemicals Under the Toxic Substances Control Act (TSCA) Section Five. In: Landis, Hughes, Lewis. Environmental Toxicology & Risk Assessment. American Society for Testing and Materials, Philadelphia PA, p 50.

SafePharm (2003a) OS166855: Determination of general physico-chemical properties. Project no. 525/520. SafePharm Laboratories Limited Derbyshire, UK (unpublished report submitted by the notifier).

SafePharm (2003b) OS166855: Determination of general physico-chemical properties. Project no. 525/521. SafePharm Laboratories Limited Derbyshire, UK (unpublished report submitted by the notifier).

Snow R (1997) Used Oil Management. Paper presented at the Used Oil Management Conference, Brisbane, August 1997, Queensland Dept. Environment.