File No. EX/101 (PLC/455)

April 2008

# NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

# **FULL PUBLIC REPORT**

#### Z-54

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 the Environment, Water, Heritage and the Arts.

For the purposes of subsection 78(1) of the Act, this Full Public Report may be inspected at our NICNAS office by appointment only at 334-336 Illawarra Road, Marrickville NSW 2204.

This Full 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:

Street Address: 334 - 336 Illawarra Road MARRICKVILLE NSW 2204, AUSTRALIA.

Postal Address: GPO Box 58, SYDNEY NSW 2001, AUSTRALIA.

TEL: + 61 2 8577 8800 FAX + 61 2 8577 8888. Website: www.nicnas.gov.au

Director NICNAS

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# **FULL PUBLIC REPORT**

# **Z-54**

#### 1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)

Holder of the original assessment certificate (No. 1918, PLC/455):

Lubrizol International Inc (ABN 52 073 495 603)

28 River Street

SILVERWATER NSW 2128

Applicant for an extension of the original assessment certificate:

Fuchs Lubricants Australasia Pty Ltd (ABN 88 005 681 916)

49 McIntyre Rd

Sunshine Victoria 3020

NOTIFICATION CATEGORY

Polymer of Low Concern

EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication:

Other names

Structural formula

Number Average Molecular Weight

Weight Average Moleculare Weight

Weight percentage of species MW<1000 and MW<500

Polymer constituents

Residual monomers and impurities

Reactive functional groups

Manufacture or import volume

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)

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

Particle size distribution

Melting point

Flammability limits

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

None

NOTIFICATION IN OTHER COUNTRIES

Korea (2003), Canada (2003), USA (2003)

#### 2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

Z-54, Titan GT1 Pro C3 (Fuchs finished product)

CAS NUMBER

None allocated

# 3. PLC CRITERIA JUSTIFICATION

| Criterion  | Criterion met           |  |  |
|--|-------------------------|--|--|
|  | (yes/no/not applicable) |  |  |
| 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                     |  |  |
| Not Water Absorbing  | Yes                     |  |  |
| Low Concentrations of Residual Monomers                      | Yes                     |  |  |
| Not a Hazardous 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 Brown, highly viscous liquid

Boiling Temperature No boiling temperature could be determined as

decomposition of the material occurred at 227°C. The boiling temperature was calculated to be greater than 400°C using an adaptation of the Stein and

Brown Method

The pour point was determined to be 65°C.

**Density** 982 kg/m<sup>3</sup> at 20°C

Water Solubility <1x10<sup>-3</sup> g/L at 20°C (determined through TOC

analysis)

<1.85x10<sup>-4</sup> g/L at 20°C (determined by GPC) The flask method (OECD TG 105) was used.

Dissociation Constant Not determined; the notified polymer contains

carboxylic acid groups, expected to have typical

acidity.

Reactivity Not an oxidiser.

**Degradation Products**Carbon dioxide, carbon monoxide, aldehydes, and

oxides of calcium will be formed.

Other Properties Other data provided by the notifier include: Vapour

Pressure <4.0x10<sup>-5</sup> Pa at 25°C. Partition Coefficient (2 major components present) logPow (1) <0.3 and (2) >9. Adsorption Coefficient (2 major components

present)  $\log \text{Koc}(1) < 1.25 \text{ and } (2) > 5.63.$ 

Fat Solubility, soluble in all proportions at  $37\pm$ 

0.05°C.

Data published in the original assessment of the notified polymer (PLC/455)

# 5. INTRODUCTION AND USE INFORMATION

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

|           | Year   | 1   | 2    | 3      | 4      | 5      |
|-----------|--------|-----|------|--------|--------|--------|
| Extension | Tonnes | 15  | 20   | 25     | 35     | 45     |
| Original  | Tonnes | 1-3 | 3-10 | < 1000 | < 1000 | < 1000 |

Use

The notified polymer is used as detergent in passenger car and heavy-duty engine oils.

# Mode of Introduction and Disposal

The notified polymer will not be manufactured in Australia. The notified polymer will be imported in sealed isotainers, 330 gallon IBC containers and 55 gallon drums, as a component of a fuel additive package. Levels of the notified polymer in the fuel additive packages will range from 5 to 15%.

The fuel additives will be pumped directly from the isotainers and drums into blending tanks, where it is diluted with mineral oil and other additives to form the final product. Typically the level of the notified polymer in the final product will range from 1 to 5%.

The notified polymer may also be imported as a component (< 2.5%) in finished engine oil.

Disposal is via recycling, incineration or landfill.

#### 6. HUMAN HEALTH IMPLICATIONS

#### **Hazard Characterisation**

No toxicological data were submitted. The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard.

| Endpoint and Result                            | Assessment Conclusion |             |                      |  |
|--|-----------------------|-------------|----------------------|--|
| Endpoint                                       | Result                | Classified? | Effects<br>Observed? |  |
| Rat, acute oral                                | LD50 >2500 mg/kg bw   | no          | no                   |  |
| Rat, oral repeat dose toxicity – 28 days.      | NOEL = 1000 mg/kg bw  | no          | yes                  |  |
| Genotoxicity - bacterial reverse mutation      | non mutagenic         | no          | no                   |  |
| Genotoxicity – in vitro chromosomal aberration | non genotoxic         | no          | yes                  |  |

# Data published in the original assessment of the notified polymer (PLC/455)

All results were indicative of low hazard. In the 28 day repeat dose study changes in clinical observations, behavioural assessments, bodyweight, blood chemistry, organ weight, necropsy, and histopathology were observed but all the changes were deemed as being of no toxicological significance.

In the *in vitro* chromosome aberration test in CHL cells a slight increase in the frequency of polypoidy was observed at the cells treated at mid dose for 6 hours with metabolic activation only. This increase in polypoidy was deemed not to be of toxicological significance.

All results were indicative of low hazard.

#### Occupational Health and Safety Risk Assessment

Transport and Storage

During transport of the product (containing the notified polymer), workers are not likely to come into dermal and ocular contact with 5- 15% the notified polymer except in the case of accidental leaks and spillages of the drums and containers.

# Reformulation

Blending and reformulation of the product containing up to 15% notified polymer occurs automatically or semi-automatically in well ventilated areas. The operation will also involve workers flushing the isotainer or drum with mineral oil to remove residual products (approximately 1%). Dermal and ocular exposure may potentially occur during these processes but workers handling the products containing the notified polymer are expected to wear PPE (gloves, protective aprons and closed shoes).

Exposure to the notified polymer is limited because of the fully automated processes, and the engineering controls and personal protective equipment worn by workers.

# **Public Health Risk Assessment**

The final fuel additive products containing the notified polymer are available to the general public. Members of the public will make dermal contact and possibly accidental ocular contact with the products containing the notified polymer. However, exposure will be low because the notified polymer is present at low concentrations (1-5%).

#### 7. ENVIRONMENTAL HAZARDS

#### **Hazard Characterisation**

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

# **Environmental Risk Assessment**

A survey by the Australian Institute of Petroleum (AIP 1995) indicates that around 90% of oil changes take place in specialised automotive service centres, where old oil drained from crankcases are expected to be disposed of responsibly - either to oil recycling or incineration and negligible release of the notified polymer should result from these professional activities. Incineration of waste polymer will generate water vapour and oxides of carbon.

Therefore, the main environmental exposure is expected to result from inappropriate disposal of waste lubricant products by DIY enthusiasts, which may be widespread across Australia.

A recent report estimated that DIY activities account for between 7 to 10% of the unaccounted for used oil (MEINHARDT 2002) and 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.

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 and enter the aquatic compartment. This could be expected to become associated with suspended organic material, settle out into the sediments and slowly degrade due to the biotic and abiotic processes.

The aquatic toxicity of the notified polymer has not been measured. According to the MSDS the acute LC/EC50 towards fresh and saltwater fish, saltwater aquatic invertebrates, algae and bacteria is >1000 mg/L based on similar products. No test reports were provided.

According to the MSDS the biodegradability of the product using the test OECD 301 was shown to be moderate, with at least 25% of the components of the product being degraded. No test reports were provided.

Further, the low water solubility of the notified polymer and its limited release to the aquatic environment (mainly via stormwater drainage) can expect to reduce the possibility of sufficient amounts to remain in solution to cause acute toxicity. The notified polymer's ability to become associated with the sediments and moderate biodegradation will further reduce the risk to the aquatic life.

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

# 8. CONCLUSIONS AND RECOMMENDATIONS

Based on the information provided by the extension applicant, the human health and environmental risk assessment is similar to the original assessment.

#### Human health risk assessment

Under the conditions of the occupational settings described, the notified polymer is not considered to pose an unacceptable risk to the health of workers.

#### **Environmental risk assessment**

Based on the reported use pattern, the notified polymer is not considered to pose a risk to the environment.

#### Recommendations

CONTROL MEASURES

Occupational Health and Safety

• 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 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 chemical 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 chemical from entering waterways.

# Emergency procedures

 Spills/release of the notified chemical should be handled by stoping 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 noncombustible adsorbent materials in disposable containers and dispose of in a manner consistent with government regulations.

#### 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 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
  - the function or use of the notified polymer has changed from a detergent in engine oils, or is likely to change significantly;
  - the amount of notified polymer being introduced has increased from 45 tonnes, or is likely to increase, significantly;
  - if 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 chemical on occupational health and safety, public health, or the environment.

The Director will then decide whether secondary notification is required.

No additional secondary notification conditions are stipulated.

Material Safety Data Sheet

The MSDS of the notified polymer (and products containing the notified polymer) provided by the notifier was reviewed by NICNAS. The accuracy of the information on the MSDS remains the responsibility of the applicant.

#### **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.

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