

File No: PLC/94

April 1999

**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION
AND ASSESSMENT SCHEME**

FULL PUBLIC REPORT

CP-506

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Director
Chemicals Notification and Assessment

FULL PUBLIC REPORT**CP-506****1. APPLICANT**

Lubrizol International, Inc. of 28 River Street SILVERWATER NSW 2141 has submitted a notification statement accompanying their application for assessment of a synthetic polymer of low concern, 'CP-506'.

2. IDENTITY OF THE CHEMICAL

The following requests for exempt information were accepted:

chemical name;
molecular and structural formulae;
molecular weight;
spectral data;
polymer composition;
residual monomers;
impurities;
detailed use information; and
exact import volume.

**Chemical Abstracts Service
(CAS) Registry No.:** not assigned

Other Names: CP-506
OS 137874

3. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance at 20°C
and 101.3 kPa:** clear viscous yellow liquid (polymer solution
containing the notified polymer in mineral oil)

Melting Point: not determined

Specific Gravity: 0.95

Water Solubility: 2.72 mg/L at 20°C

Flammability Limits: not determined

Autoignition Temperature:	not determined
Flash Point:	176°C
Explosive Properties:	not explosive
Polymer Stability:	stable under normal conditions of storage
Hydrolysis:	not determined

Comments on Physico-Chemical Properties

The water solubility of the polymer was determined using an FTIR detection method adapted from ASTM procedure D3921. The method employed was in accordance with the European EEC Method A6-Water Solubility. In view of the hydrophobic nature of the polymer and its monomer constituents, the notified polymer was more soluble than expected.

The notified polymer contains ester functionalities, which have the potential to hydrolyse. However, given the low water solubility of the polymer, this would be unlikely in the environmental pH range.

4. USE, VOLUME AND FORMULATION

The notified polymer will not be manufactured in Australia. It will be imported as a commercial additive package for use as a component of gear oil. Import volumes for the notified polymer are expected to be less than 20 tonnes per annum.

5. OCCUPATIONAL EXPOSURE

The notified chemical, CP-506, will be imported as a component of a finished commercial additive package in 205 L steel drums or iso containers. The steel drums containing the commercial additive package will be distributed to lubricant manufacturers for subsequent blending to produce gear oil. The notifier indicates that re-labelling of drums in accordance with the NOHSC Code of Practice for the Labelling of Workplace Substances (National Occupational Health and Safety Commission, 1994b) is required prior to distribution to lubricant manufacturers. Waterside, warehouse and transport workers would not be exposed to the notified polymer under normal circumstances, as they will be handling sealed steel drums or iso containers containing the notified polymer. The notifier states that 1 to 2 workers are involved in the above operations.

At the customer site, the commercial additive package is transferred via a closed system and blended with base oil and other additives to produce the finished gear oil. The notifier indicates that blending operations involved in the production of gear oils are highly automated, and require 1 to 2 workers with minimal supervision. The final products are filled

into 1L to 200L containers using an automated filling line.

There is potential for dermal, eye and inhalation exposure of workers during connecting and disconnecting hoses during blending and drumming operations, and when cleaning and maintaining equipment after use. Safety equipment and engineering controls, including containment pans, mechanical ventilation and scrubbers, are employed to prevent workers exposure during the above operations. The MSDS provided also states that protective equipment including long sleeves, nitrile or neoprene gloves, and safety glasses or facemasks as appropriate, should be worn.

The majority of the gear oil will be sold to commercial operators, although sale to small repair shops is also anticipated. Exposure of the hands is likely as it is uncommon for gloves to be worn during engine maintenance and oil changing activities.

The additive package containing the notified polymer also contains mineral oil. Therefore, products containing the notified polymer also contain a small proportion of mineral oil. Workers may be exposed to mineral oil mist if mists or vapours are generated during heating or pressure discharge of products containing the notified chemical.

7. PUBLIC EXPOSURE

Public exposure from transport, storage and blending operations is expected to be negligible except in the event of an accident. Spills will be contained, collected and disposed of according to government regulations or recycled. Empty drums containing residues of the notified polymer will be sent to a drum reconditioner and the residues will be consigned to landfill.

Gear oils containing the notified polymer will be sold only to commercial operators and repair facilities. It will not be sold directly to the public. Public exposure from disposal and from the industrial use is considered to be very low.

8. ENVIRONMENTAL EXPOSURE

Release

The notifier states that the blending operations will be highly automated with minimum release to the environment. Material is pumped directly into the blending tanks. It is anticipated that diluent oil will be used to flush the drums and the flushings are added to the blend.

Some environmental release can occur through reconditioning of the import drums. Alternatively, drums and residues are disposed by landfill.

Gear oils are changed infrequently and, in the majority of cases, under well-controlled conditions. Gearboxes lose little volume over the service life of the oil. Releases to the environment may occur if the machinery is not functioning properly. However, it is difficult to determine the amount that may be released in this way as the size of the equipment is a factor.

Losses from accidental spills of larger amounts are likely to be extensively adsorbed to soils or absorbent materials. They can be shovelled up or recovered by vacuum equipment and disposed of at an appropriate waste disposal facility. The notified polymer is unlikely to enter the aquatic environment due to its low water solubility, except when adsorbed to eroded soil particles.

Waste gear oil is likely to account for the greatest level of environmental exposure of the notified polymer, and may be disposed of in two ways. Some customers may elect to drain the used oil and store it in a used oil container for later collection by a contractor. However, it is realistic to assume that some may be disposed of by open burning, or other unapproved disposal to soil or water (Macpherson, 1997).

Fate

The major release of the notified polymer to the environment would be via spillage of gear oil during servicing or use. This material may be collected then disposed of at an approved incineration facility.

When spent gear oil is not contaminated with water, it will be directly burned for fuel. Most spent gear oils in Australia are sold as burner fuel, for instance to power stations, cement kilns, brick works and limeworks (Fortescue, 1997). The polymer in the gear oil will be destroyed during such burning, yielding water and oxides of carbon.

No data have been supplied for the biodegradation of the notified polymer. Bioaccumulation of the polymer is not expected because of the large molecular size, which is likely to inhibit membrane permeability and prevent uptake during exposure (Gobas et al., 1986).

9. EVALUATION OF TOXICOLOGICAL DATA

No toxicology data were submitted. The Material Safety Data Sheet (MSDS) for the notified polymer describes anticipated health effects of the polymer based on effects observed in similar materials. The MSDS states that the polymer would have very low acute oral toxicity and low acute dermal toxicity (rat LD₅₀ > 5 000 mg/kg and rabbit LD₅₀ > 2 000 mg/kg, respectively).

10. ENVIRONMENTAL EFFECTS

No ecotoxicology data were provided. This is acceptable for polymers of NAMW greater than 1 000, according to the Act.

11. ASSESSMENT OF ENVIRONMENTAL HAZARD

The notified polymer is unlikely to present a hazard to the environment at any stage of its use. Considering the proposed import quantity of the notified polymer, it is expected that negligible amounts will be released from the blending sites.

Maintained machinery should have minimal leakage of gear oils. The greatest exposure is likely to be during the infrequent changing of the oils. The ultimate fate of most waste gear

oil is as burner fuel for power stations, cement kilns, brick works, lime works etc. Some may be disposed of inappropriately by open burning, or other unapproved disposal to soil or water.

Any accidental spillage would be expected to adsorb strongly to soils, and only reach the aquatic compartment if adsorbed to eroded soil particles. Combustion of the notified product will produce oxides of carbon, nitrogen and hydrogen.

Low environmental hazard is expected through the use of this polymer.

12. ASSESSMENT OF PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY EFFECTS

The notified polymer has a high NAMW of greater than 1 000, which should preclude transport across biological membranes. There are no low molecular weight species (NAMW less than 500) present in the notified polymer and it does not contain any reactive functional groups; hence, no toxicity is expected from these sources. The notified polymer contains a number of methacrylates as residual monomers. Methacrylates appear in the NOHSC List of Designated Hazardous Substances (National Occupational Health and Safety Commission, 1994a). Information on the MSDS indicates that the polymer may cause skin and eye irritation based on data from similar materials. However, the total concentration of methacrylates present in the polymer is well below the cut-off level for classification as irritating to eyes, the respiratory system and skin (National Occupational Health and Safety Commission, 1994a). The MSDS also indicates that the polymer would have very low acute oral toxicity and low acute dermal toxicity (rat LD₅₀ > 5 000 mg/kg and rabbit LD₅₀ > 2 000 mg/kg, respectively).

The occupational health risk for waterside, warehouse and transport workers is negligible, as exposure is not expected to occur under normal circumstances.

Blending of chemicals to form gear oils occurs in an enclosed automated system so that exposure is limited to contact with the notified polymer during connecting and disconnecting hoses, as well as in cleaning and maintaining equipment after use. The notifier recommends the use of safety equipment and engineering control, including containment pans, mechanical ventilation and scrubbers, to minimise exposure to the notified polymer. In addition, the wearing of recommended protective clothing, neoprene or nitrile gloves, safety glasses and appropriate respiratory protection should minimise potential exposure.

End use of the formulated products, namely, engine maintenance and oil changing activities may potentially result in frequent exposure if gloves are not worn. However, the risk of adverse health effects from this source is low given that the notified polymer is present at low concentrations, typically below approximately 10%. Workers involved in such activities should wear neoprene or nitrile gloves to minimise dermal contact to the notified polymer.

The additive package containing the notified polymer also contains mineral oil. Local exhaust ventilation is employed to control workers exposure to mist or vapours generated from heating or discharge of products containing the notified polymer. The MSDS states that self-contained breathing apparatus for entry into confined space or in poorly ventilated areas

is also recommended. Employers need to ensure that the exposure standard for mineral oil mist of 5 mg/m³ (TWA) (National Occupational Health and Safety Commission, 1995) is not exceeded during blending, drumming, or oil changing operations.

The potential for public exposure to the notified polymer during transport, storage, gear oil formulation and use or from disposable is assessed as negligible. The public is unlikely to make contact with the notified polymer in the industrial setting. Furthermore, the notified polymer will only be sold to commercial operators and repair shops and will not be publicly available. In the event of spill, the notified polymer is absorbed into an inert material and disposed of in accordance with government regulations.

13. RECOMMENDATIONS

To minimise occupational exposure to CP-506 the following guidelines and precautions should be observed:

- Safety goggles should be selected and fitted in accordance with Australian Standard (AS) 1336 (Standards Australia, 1994) to comply with Australian/New Zealand Standard (AS/NZS) 1337 (Standards Australia/Standards New Zealand, 1992);
- Industrial clothing should conform to the specifications detailed in AS 2919 (Standards Australia, 1987) and AS 3765.1 (Standards Australia, 1990);
- Impermeable gloves or mittens should conform to AS 2161.2 (Standards Australia, 1998);
- All occupational footwear should conform to AS/NZS 2210 (Standards Australia/Standards New Zealand, 1994);
- Spillage of the notified chemical should be avoided. Spillages should be cleaned up promptly with absorbents which should then be put into containers for disposal;
- Good personal hygiene should be practised to minimise the potential for ingestion;
- A copy of the MSDS should be easily accessible to employees.

There is a NOHSC exposure standard for mineral oil mist of 5 mg/m³ (TWA). Employers are responsible for ensuring that this level is not exceeded in the workplace.

14. MATERIAL SAFETY DATA SHEET

The MSDS for the notified chemical was provided in accordance with the *National Code of Practice for the Preparation of Material Safety Data Sheets* (National Occupational Health and Safety Commission, 1994c).

This MSDS was provided by the applicant as part of the notification statement. It is reproduced here as a matter of public record. The accuracy of this information remains the responsibility of the applicant.

15. REQUIREMENTS FOR SECONDARY NOTIFICATION

Under the Act, secondary notification of the notified chemical shall be required if any of the circumstances stipulated under subsection 64(2) of the Act arise. No other specific conditions are prescribed.

16. REFERENCES

Fortescue G (1997). Used Oil - Collection, Processing and Disposal. Used Oil Management Conference, Brisbane, QLD, Australia.

Gobas FAPC, Opperhuizen A & Hutzinger O (1986) Bioconcentration of Hydrophobic Chemicals in Fish: Relationship with Membrane Permeation. Environmental Toxicology and Chemistry, 5 : 637-646.

Macpherson E (1997). Minimising the Environmental Impacts of Oil. Used Oil Management Conference, Brisbane, QLD, Australia.

National Occupational Health and Safety Commission (1994a) List of Designated Hazardous Substances [NOHSC:10005(1994)]. Australian Government Publishing Service, Canberra.

National Occupational Health and Safety Commission (1994b) National Code of Practice for the Labelling of Workplace Substances [NOHSC:2012(1994)]. Australian Government Publishing Service, Canberra.

National Occupational Health and Safety Commission (1994c) National Code of Practice for the Preparation of Material Safety Data Sheets [NOHSC:2011(1994)]. Australian Government Publishing Service, Canberra.

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Standards Australia (1987) Australian Standard 2919-1987, Industrial Clothing. Standards Association of Australia, Sydney.

Standards Australia (1990) Australian Standard 3765.1-1990, Clothing for Protection against Hazardous Chemicals Part 1 Protection against General or Specific Chemicals. Standards Association of Australia, Sydney.

Standards Australia (1994) Australian Standard 1336-1994, Eye protection in the Industrial Environment. Standards Association of Australia, Sydney.

Standards Australia (1998) Australian Standard 2161.2:1998, Occupational Protective Gloves, Part 2: General Requirements. Standards Association of Australia, Sydney.

Standards Australia/Standards New Zealand (1992) Australian/New Zealand Standard 1337-1992, Eye Protectors for Industrial Applications. Standards Association of Australia/Standards Association of New Zealand, Sydney/Wellington.

Standards Australia/Standards New Zealand (1994) Australian/New Zealand Standard 2210-1994, Occupational Protective Footwear. Standards Association of Australia/Standards Association of New Zealand, Sydney/Wellington.