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

FULL PUBLIC REPORT

Viscobase 11-572

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**Director
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FULL PUBLIC REPORT**Viscobase 11-572****1. APPLICANT AND NOTIFICATION DETAILS**

APPLICANT(S)

Degussa Australia Pty Ltd (ABN 80 005 415 752) of 30 Commercial Drive Dandenong VIC 3175.

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 and Structural Formulae, Molecular Weight, Polymer constituents, Use Details, Import Volume, and Site of Reformulation.

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)

No variation to the schedule of data requirements is claimed.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

None

NOTIFICATION IN OTHER COUNTRIES

None

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

Viscobase 11-572, Viscobase 11-572 (3001), Viscoplex 11-572, VPL 11-572.

3. COMPOSITION

PLC CRITERIA JUSTIFICATION

<i>Criterion</i>	<i>Criterion met (yes/no/not applicable)</i>
Molecular Weight Requirements	Yes
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. 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

As an oil additive.

5. PROCESS AND RELEASE INFORMATION

5.1. Operation Description

The notified polymer will not be manufactured in Australia but will be imported from Europe in bulk or drum containers (175 kg drums) for use in the formulation of industrial oils and lubricants. A sealed delivery system will be employed to transfer Viscobase 11-572 from the shipment containers to customer's storage tanks and/or blending vessels for mixing with other ingredients. The resulting lubricant product containing <30% Viscobase 11-572 will then be filled into different size containers (4-L jugs or 1-L bottles) and transported to distributors and/or a range of end-users such as industrial assembly plants, commercial sites or consumer markets across Australia.

The entire process of transferring lubricants is generally automated and computer controlled. All loading, unloading, handling and storage of the product within the Degussa or its customer blending facilities are expected to be performed by well-trained staff. Industrial hygiene programs are implemented which include the provision and routine use of personal protective equipment (eg splash proof goggles, rubber overshoes, chemically resistant gloves, aprons, or other impervious clothing, and respiratory protection), and hazard communication programs designed to inform workers about the identity and potential hazards (if any) of chemicals used in their respective work areas. Periodic workplace inspections are also carried out to ensure that all safety procedures are in place and that employee exposures are below acceptable thresholds.

6. EXPOSURE INFORMATION

6.1. Summary of Environmental Exposure

Environmental exposure associated with the manufacture of the notified polymer will not occur in Australia. The losses during the blending process and use in industrial assembly plants will be minimised by the use of sealed delivery systems and automated and computer controlled processes. In the event of a spill the released amount is expected to be small as the lubricants typically contain less than 30% notified polymer.

The amount of residue in import drums was estimated to be a maximum of 50 kg per annum. These drums will be emptied thoroughly to minimise the amount of the polymer collected by cleaning (usually with petroleum based solvents) and recycled. The drums that cannot be cleaned will be disposed of at an approved waste disposal facility. Equipment in blending and assembly plants will also be cleaned with petroleum-based solvents. The waste polymer and oil-based products resulting from drum and equipment cleaning will be burnt in an enclosed controlled burner for fuel value or disposed of by supervised incineration. Generally, the blending and assembly plants are obliged to dispose wastes in accordance with state and local regulations.

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 around 86% of oil changes take place in specialised commercial sites, where used oil 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 for 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 (ie burned as workshop heating oil or sent for recycling), negligible release of the notified polymer should result from these professional activities. In a worst case scenario, 14% or up to 14 tonnes of the notified polymer could be used by DIY enthusiasts, resulting in 2.8 tonnes of this being collected for recycling, 3.5 tonnes being buried or sent to landfill, 700 kg being released to stormwater drains, and up to 7 tonnes being disposed of in other ways, as specified previously.

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 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.

6.3. Summary of Public Exposure

There is potential for dermal exposure by the public purchasing the formulated oils or lubricants in do-it-yourself maintenance tasks. However, exposure will be low because the formulated products contain <30% notified polymer and are presented in small size containers.

7. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa	Viscous, colourless and odourless liquid
Melting Point/Glass Transition Temp	≥-21°C
Density	933 kg/m ³
Water Solubility	0.2 g/L
Reactivity	Stable under normal environmental conditions
Degradation Products	None when used as directed

8. HUMAN HEALTH IMPLICATIONS

8.1. Toxicology

An expert opinion summarising available toxicological data of Viscobase 11-572 and its monomers was submitted. It was concluded that all results, including acute oral toxicity, and skin and eye irritation for the notified polymer, were indicative of low hazard.

8.2. Human Health Hazard Assessment

The notified polymer meets the PLC criteria and the review of the toxicological data supports the conclusion of low hazard.

9. ENVIRONMENTAL HAZARDS

9.1. Ecotoxicology

The following toxicological results were submitted (without test reports):

<i>Endpoint</i>	<i>Result and Conclusion</i>
Ready Biodegradability	Not readily biodegradable
Fish Toxicity	EC50 >1000 mg/L
Inhibition of Bacterial Respiration	EC50 >800 mg/L*

* From the MSDS

The result of the fish toxicity study indicated that the polymer is not toxic to fish, up to its water solubility limit.

9.2. Environmental Hazard Assessment

The main environmental exposure is expected to result from inappropriate disposal of waste lubricant product by DIY enthusiasts, which is widespread across Australia. Most of the improperly released notified polymer is likely to become associated with soils or sediments, as will the notified polymer released to landfill (including container residues). Incineration of waste polymer will generate water vapour and oxides of carbon.

The notified polymer which is released to stormwater drains (less than 1% of the import volume) and enters the aquatic compartment 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.

10. RISK ASSESSMENT

10.1. Environment

A predicted no effect concentration (PNEC) for aquatic ecosystems of >1 mg/L (1000 $\mu\text{g/L}$) has been derived by dividing the LC50 value provided by an uncertainty (safety) factor of 1000 (instead of 100 used when toxicity data is available for three trophic levels).

It is difficult to estimate the Predicted Environmental Concentration (PEC) of the notified polymer released into the aquatic environment via stormwater drains. However, a worst case PEC might be estimated assuming that all 5% of the total notified polymer from DIY use (ie 700 kg) will be released into the stormwater drains in a single metropolitan area with a geographical footprint of 500 km^2 and an average annual rainfall of 50 cm. With the maximum annual release of 700 kg into this localised stormwater system and the annual volume of water drained from this region estimated to be approximately $25 \times 10^{10} \text{ dm}^3$, the resultant PEC is approximately $2.8 \times 10^{-18} \mu\text{g/L}$. However, it should be noted that in reality releases of the polymer would be very much more diffuse than indicated here, and also at significantly reduced levels. The estimated worst-case risk quotient ($Q = \text{PEC/PNEC}$) thus is significantly below 1.

Given the potential for a small fraction of the formulated oil to enter the sewerage system, another worst-case scenario is considered that 10% the notified polymer is released to sewer and not removed during sewage treatment processes. Assuming a national population of 19.5 million and that each person contributes an average 200 L/day to overall sewage flows, the daily release on a nationwide basis to receiving waters is estimated to be 27.4 kg/day and the predicted concentration in sewage effluent on a nationwide basis is estimated as 7.02 $\mu\text{g/L}$. Based on the respective dilution factors of 1 and 10 for inland and ocean discharges of effluents, the PECs of the notified polymer in freshwater and marine water may approximate 7.02 and 0.702 $\mu\text{g/L}$, respectively. The resulting risk quotients for the aquatic environment are $<7.02 \times 10^{-3}$ and $<7.02 \times 10^{-4}$ for freshwater and marine water, respectively. These values are significantly less than 1 and can be expected to be much lower due to treatment and attenuation within the sewerage system.

Further, the low water solubility of the polymer and its potential to become associated with the sediments can expect to reduce the possibility of the amounts remaining in solution to cause acute toxicity in the aquatic environment. The high molecular weight indicates a low potential for bioaccumulation. Overall, the environmental risk from the proposed use of the notified polymer is expected to be low. However, the potential exists for physical fouling of aquatic organisms by undissolved material in the event of a sizeable release to waterways. For this reason and due to the uncertainty of toxic effects to other aquatic organisms, the notified polymer should be prevented from entering waterways.

10.2. Occupational health and safety

The OHS risk presented by the notified polymer is expected to be low. The notified polymer

may be present in formulations containing hazardous ingredients. If these formulations 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.

10.3. Public health

Members of the public may make dermal contact with products containing the notified polymer. However, the risk to public health will be negligible because the notified polymer is present at low concentrations and chemically stable.

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 accord with directions printed on the label of consumer size lubricant products.

12. MATERIAL SAFETY DATA SHEET

12.1. 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

- 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.

- In the interest of occupational health and safety, the following guidelines and precautions should be observed for use of the oil/lubricant products:
 - Fully enclosed and automated processes at the formulation and blending sites, including sealed and automatic transfer lines/pumps for loading and emptying of transport and storage tanks and blending vessels;
 - Standard operating procedures are in place;
 - Adequate training for staff in handling oils and lubricants;
 - Implementation of general health surveillance and monitoring programs as required.

- 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 should be disposed of in accordance with Local, State and Federal regulations and at an approved waste disposal facility. This will include burning wastes and products containing the polymer in an enclosed, controlled burner for fuel value or disposed of by supervised incineration.
- Contaminated packaging should be emptied thoroughly and may be reused after appropriate cleaning. Packaging that cannot be cleaned should be disposed of by a licensed waste disposal contractor.

Emergency procedures

- Spills/release of the notified polymer should be handled as outlined in the MSDS and in accordance with government regulations.
- The spilled material should be prevented from entering drains, surface/ground water, and soil/subsoil.

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.

14. BIBLIOGRAPHY

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 Department of Environment.