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

**FULL PUBLIC REPORT**

**Polymer in Viscoplex ® 3/6230**

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**Director  
Chemicals Notification and Assessment**

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**FULL PUBLIC REPORT****Polymer in Viscoplex ® 3/6230****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

Philippines (2004).

**2. IDENTITY OF CHEMICAL**

## MARKETING NAME(S)

Viscoplex 3/6230, Viscoplex 3/6230 (0001), Viscoplex 3/6230 (0003) (oils containing 40 – 70% of the notified polymer).

**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>	< 10	< 10	< 10	< 10	< 10

USE  
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 Viscoplex ® 3/6230 from the shipment containers to customer's storage tanks and/or blending vessels for mixing with other ingredients. The resulting lubricant product containing ≤ 1% Viscoplex ® 3/6230 will then be filled into drums 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

Since the notified polymer will not be manufactured locally, there will be no environmental exposure associated with this process in Australia. The losses during transportation, storage and handling and during the blending process and use in industrial assembly plants are minimised by the safety practices, use of sealed delivery systems and automated and computer controlled processes.

The amount of residue in import drums was estimated to be less than 0.1% (a maximum of 10 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 reused or recycled. The drums that cannot be cleaned will be disposed of professionally in accordance with Australian regulations. Equipment in blending and industrial car 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.

The majority of the blended products manufactured will be sold to major automobile manufacturing plants for use in new cars. The amount released in the event of a spill in an industrial assembly plant is expected to be small as the lubricants typically contain less than 1% notified polymer. The spill control measures that are in place are expected to minimise the release from any accidental spills. The amount of the notified polymer released during the filling process is expected to be negligible since the entire process is automated and computer-controlled and sealed delivery lines are used.

The amount of residual notified polymer remaining in the emptied blended oil drums is expected to be less than 0.1% (a maximum of 10 kg) per annum. The methods of cleaning and/or disposal of drums, cleaning of equipment and waste disposal in an automobile manufacturing plant are stated to be as same as those in the blending facilities. Generally, blending and industrial assembly plants are obliged to disposed wastes in accordance with the local, State and Federal regulations.

In addition to being used by the automobile manufacturing plants, the blended oil products containing the notified polymer are also made available to commercial garages and consumers (DIY enthusiasts) in smaller quantities. While waste oil products can be expected to be disposed of in a responsible manner by professional mechanics at specialised commercial garages, it is more likely that they are disposed of improperly by DIY enthusiasts.

The greatest potential for exposure is therefore through improper disposal of oil product wastes containing the notified polymer. A survey by the Australian Institute of Petroleum (AIP, 1995) indicates that approximately 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 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 and 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 approximately 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 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, 14% of the used oil containing up to 1400 kg of the notified polymer could be used by DIY enthusiasts, resulting in up to 280 kg (20%), 350 kg (25%), 70 kg (5%) and 700 kg (50%) collected for recycling, buried or sent to landfill, released to stormwater drains and 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. The oil products will be mainly used in new cars in major automobile manufacturing plants, where the waste product containing the notified polymer can expected to be disposed of properly. Therefore, the amount of oil disposed of by DIY enthusiasts will be lower than predicted above. Since the use of the oil products will occur throughout Australia, release from use or disposal will also be very diffuse.

Based on similar polymers in their product range the notifier claims that the notified polymer has very low water solubility (at pH 4 or pH 9) and very high octanol solubility ( $\log P_{ow} > 6$ ). Its poor water solubility and likely hydrophobic nature are indicative of partitioning into the octanol phase and immobility in soil. The notified polymer has hydrolysable groups, however, it is expected not to hydrolyse in the environmental pH range of 4 to 9 due to its poor water solubility. The polymer contains a small amount of a dissociable group, which is expected to remain ionised throughout the environmental pH range of 5 to 9 but become neutral before this.

## **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 in do-it-yourself maintenance tasks. However, exposure will be low because the formulated products contain  $\leq 1\%$  notified polymer.

## 7. PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance at 20°C and 101.3 kPa</b>	Viscous, yellowish liquid
<b>Melting Point/Glass Transition Temp</b>	Not determined
<b>Density</b>	Not determined, 930 kg/m <sup>3</sup> (Viscoplex ® 3/6230)
<b>Water Solubility</b>	In the range of 10 mg/L.
	The notifier estimated the above based on a test result of water solubility below 2.1 mg/L for similar (compositionally and in molecular weight) polymers. The water solubility can be expected to be low due to the presence of a vast majority of hydrophobic groups.
<b>Reactivity</b>	Stable under normal environmental conditions
<b>Degradation Products</b>	None when used as directed
<b>Flash point</b>	> 120°C (product)

## 8. HUMAN HEALTH IMPLICATIONS

### 8.1. Toxicology

An expert opinion summarising toxicological data for polymers similar to that in Viscoplex ® 3/6230 was submitted. It was concluded that 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

No eco-toxicological data were submitted.

### 9.2. Environmental Hazard Assessment

Nonionic polymers that have molecular weights greater than 1000 are 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 and to be 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.

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 can be estimated if it is assumed that all of the 1% of the imported notified polymer (i.e. 100 kg) is 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 100 kg and the annual volume of water drained from this region estimated to be approximately 250 x 10<sup>6</sup> m<sup>3</sup>, the resultant PEC is approximately 0.4 µg/L. It should be stressed that this result is very much a worst case scenario, and that in reality releases of the polymer would be very

much more diffuse than indicated here, and also at significantly reduced levels.

It is not possible to determine a predicted no effect concentration (PNEC) for aquatic ecosystems in order to assess the risk to aquatic organisms as no ecotoxicity data were provided. However, the use pattern of the notified polymer will result in limited and widespread exposure to the aquatic environment throughout Australia. Further, the low water solubility of the polymer and its potential to become associated with the sediments is expected to reduce the possibility of sufficient amounts to remain in solution to cause acute toxicity in the aquatic environment. While it can be assumed that the notified polymer will not degrade readily, it is likely to undergo slow biodegradation under environmental conditions.

The amount released to stormwater drains (less than 1% of the import volume) and entering the aquatic compartment could be expected to become associated with suspended organic material, settle out into the sediments and slowly degrade due to biotic and abiotic processes. There is potential for the notified polymer to bioaccumulate due to its high likely octanol solubility but will be limited due to the high molecular weight, and the low and diffuse release to the aquatic environment Australia wide.

Overall, the environmental hazard 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 advent of a sizeable release to waterways. For this reason and 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 is 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**

#### **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:
  - 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 should be 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 all Local, State and Federal regulations 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 optimally and may be reused after appropriate professional cleaning. Packaging that cannot be cleaned should be disposed of professionally.

##### Emergency procedures

- Spills on non-solid ground (e.g. soil etc) should be removed mechanically. Spills on solid surfaces (e.g. concrete) should be absorbed with dry sand, possibly by heating. Dispose of contaminated material in accordance with regulations.
- The spilled material should be prevented from contaminating soil/subsoil and entering drains, surface water, ground water or wastewater.

#### 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.

Nabholz JV, Miller P and Zeeman M (1993) Environmental Risk Assessment of New Chemicals Under the Toxic Substances Control Act (TSCA) Section Five. In: Landis WG, Hughes JS & Lewis MA ed Environmental Toxicology and Risk Assessment, ASTM STP 1179, American Society for Testing and Materials, Philadelphia, PA.

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