

File No: EX/7 (PLC/45)

August 1999

**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION
AND ASSESSMENT SCHEME**

FULL PUBLIC REPORT

Polymer in Plexol EF-171/ Polymer in EAL 224H/ Polymer in Acryloid 3103

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Director
Chemicals Notification and Assessment

FULL PUBLIC REPORT

Polymer in Plexol EF-171/ Polymer in EAL 224H/ Polymer in Acryloid 3103

1. APPLICANT

Plastral-Fidene of 11B Lachlan Street WATERLOO NSW 2017 has submitted a notification statement in support of their application for an extension of the original assessment certificate for Polymer in Plexol EF-171/ Polymer in EAL 224H/ Polymer in Acryloid 3103.

The original assessment certificates (Certificate Nos. 539 and 540, File No. PLC/45) were issued on 7 November 1996 and are held by RohMax (c/o Rohm and Haas Australia Pty Ltd) of 969 Burke Road CAMBERWELL VIC 3124 and Mobil Oil Australia Ltd of 417 St Kilda Road (c/o Pegasus Development Centre) Corner of Millers Road and Kororoit Creek Road ALTONA VIC 3004 . RohMax and Mobil Oil Australia Ltd have agreed to this extension.

There are no significant variations in matters affecting occupational, environmental or public exposure as set out in the notification statement that accompanied the application for extension of the original certificate. It was indicated in the submission that Plastral-Fidene has purchased the business from Rohm and Haas Australia Pty Ltd and are, therefore, the local agents for RohMax. There has been no new information available to the applicant for extension of the original assessment certificate regarding the health and environmental effects of the notified chemical.

2. IDENTITY OF THE CHEMICAL

The following requests for exempt information were accepted: chemical name, CAS No., molecular and structural formulae, constituents and spectral data. These are the same data that were claimed as exempt information in the original submission.

Method of Detection and Determination:

infrared spectroscopy

3. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa:

the polymer exists only in formulation as a clear liquid

Glass Transition Temperature:

glass transition temperature is thought to be less than 20° C

Specific Gravity:

0.8742

Hydrolysis as a Function of pH:

not provided

Flammability Limits:

not provided but the polymer is not considered to be flammable

Autoignition Temperature:

not provided

Explosive Properties:

this material will not exist in dry form and therefore is considered to have minimum explosive properties

Reactivity/Stability:

under expected use and storage conditions the polymer is considered stable, at elevated temperatures the polymer will begin to thermally degrade possibly yielding methacrylate monomers

Comments on Physico-Chemical Properties

The water solubility of the notified polymer was not determined. However, the notifier presented a structurally related polymer with a water solubility of less than 2.1 ppm. The notifier contends it is likely that the notified polymer will be less soluble than the related polymer as it contains longer alkyl chain methacrylates and is estimated to have a larger NAMW. From these considerations the notifier believes that the notified polymer will have a water solubility of less than 1 ppm.

Comments on the stability of the Polymer:

The polymer is expected to be stable under normal conditions of storage and use.

The data provided are acceptable as a polymer of low concern.

4. PURITY OF THE CHEMICAL

The notified polymer contains a range of monomers but these data have not been disclosed for reasons of confidentiality.

5. USE, VOLUME AND FORMULATION

The notified polymer will not be manufactured in Australia. It will be imported by the notifier as a product containing neutral oils initially under the name Acryloid 3103. The polymer is the functional constituent of the product that will be used as a pour point depressant for crank case engine oils. Customers will blend the product into oils for final use as heavy industrial machinery lubricants in internal combustion engines. The import volumes will depend on market penetration. The product will be imported from the USA and sold to industry for reformulation.

The notifier will import the product Acryloid 3103 containing the notified polymer for use in

industrial hydraulic fluids, marine and mobile service, including high pressure systems. The product will be sold directly to customers in this finished form.

The notified chemical is to be imported at a rate of 3 tonnes per year for the first five years.

6. OCCUPATIONAL EXPOSURE

The notified polymer will be imported by the notifier as a polymer solution in oil in 19, 60, 113 and 208 L drums which will be directly sold to customers.

Transport and storage personnel involved with handling the products prior to reaching the customer site and after blending would not normally be expected to be exposed to the polymer as it is isolated by the packaging. Exposure will only occur in the unlikely event of accidental spillage.

The product containing the notified polymer will require further blending by customers. The product will be transferred via a closed system to a tank and blended in-line at a rate of less than 5% with base oil and other additives to produce the finished motor oil. The oils will then be packaged into 200 L drums and supplied to the end users. It is anticipated that up to three people will be exposed to the polymer during blending and repacking at the customer site.

The number of end-use operating sites will be approximately 10 with up to two workers exposed to the polymer at each site. The polymer will be present as a minor component of the oil lubricants and exposure will occur during engine maintenance and oil changing activities.

The main route of potential occupational exposure will be dermal for workers involved in blending operations. This is expected to occur only in connecting and disconnecting hoses during drumming of the finished motor oil when the duration of exposure is expected to be up to one hour per day for up to 10 days per year. Direct exposure of workers during application is expected to be infrequent, up to 0.25 hours per day for less than 10 days per year. The oil additive contains a high percentage of mineral oils to which there may be exposure during drumming and application.

Under normal conditions, worker exposure to the notified polymer in product Plexol EF-171 will be minimal. Operators will wear overalls, boots, protective gloves and glasses as a standard precaution and engineering controls will be used.

The products containing the notified polymer also contain mineral oils. If the mists or if vapours are generated during heating or pressure discharge there is the potential for exposure to mineral oil mist. Although mineral oil mist is not listed on the NOHSC *List of Designated Hazardous Substances* (National Occupational Health and Safety Commission, 1994b) it has the potential to cause irritation of the mucous membrane and upper respiratory tract. The base oils are present at high concentrations in the final products but under the normal conditions of use it is unlikely that the exposure threshold of 5 mg/m³ Time-Weighted Average (TWA) (National Occupational Health and Safety Commission, 1995) would be achieved. It would be prudent however to limit possible inhalation exposure by means of the appropriate engineering controls to personal protective equipment.

7. PUBLIC EXPOSURE

Products containing the polymer will be imported in robust steel drums. The notifier will then blend the product with base oils to give a final concentration of less than 5%. The public will not be sold the products containing the notified polymer. In the event of a transport spill, the polymer should be contained with an absorbent material, liquid and solids transferred into containers and incinerated.

Waste polymer will be recycled whenever possible or transferred to disposal facilities.

The public will not be exposed to the polymer during its importation and use in industry. Given the pattern of use products containing the notified polymer, high molecular weight and stability, the notified polymer represents a low risk to public health.

8. ENVIRONMENTAL EXPOSURE

Release

The product Acryloid 3103 will require further blending by customers. To produce finished motor oils, the product will be transferred via a closed system to a tank and blended in at a rate of less than 5% with base oil and other additives. Drums and mixing vessels are left to thoroughly drain to remove any left over material. The finished oils will then be packaged into 200 L drums. The notifier estimates losses attributed to formulation to be less than 5% per year.

The major source of environmental release of products containing the notified polymer is in the unlikely event of an accident during transport and/or handling. The oils can be contained with inert materials and the mixture can be shovelled into a suitable container for disposal.

The finished products containing the notified polymer will be used by a limited number of customers. Oils containing Acryloid 3103 will be used by approximately 10 customers for use in engines of heavy industry.

The notifier believes that losses of the oils during use and changing should be less than 5% per year. End-use products will be replaced on a yearly basis. The disposal of used products involves the collection of the material into a sump which is then disposed of or recycled by specialised companies. Environmental losses will be a result of leaking systems and minor cracks in collection sumps.

Fate

As the notified polymer is a component of crank case engine oils and hydraulic fluids, environmental exposure is unlikely. If there is leakage, the amount of notified polymer exposed to the terrestrial environment would be difficult to collect. The polymer is likely to bind to soils and is unlikely to become part of the aquatic compartment due to its low water solubility. It is expected to degrade very slowly in the environment due to free radical processes/ultra violet (UV) light.

The majority of notified polymer released to the environment would be due to spillage of the

product oils at either the servicing or final use stages. The notifier claims that these and used engine/hydraulic oils will be collected and disposed of to a specialised company for disposal or recycling. Waste oil may also be used for fuel value.

Approximately 40% of engine oil sold in Australia is consumed by burning during use or lost from engine leaks. Much of the oil sold in Australia is bought by industry, garages or other service centres, where used oils are collected and disposed of correctly. Only 7% of oils sold in Australia is used by the do-it-yourself market, with 12.5% of these sales recovered for recycling or disposal, with the remainder being disposed of in a variety of ways *ie* dumping with household garbage, buried or stored (Australian and New Zealand Environment and Conservation Council, 1991). Sales to the general public of products containing the notified polymer will be limited as the notified polymer is intended for use mostly in products used as heavy industrial machinery lubricants.

ANZEC reported that in Australia, 96% of waste engine oil is correctly disposed of, either used as a fuel, incinerated or landfilled in secure sites, with very little being recycled (Australian and New Zealand Environment and Conservation Council, 1991). Based on these figures and the information above, approximately 1.2 tonnes of the notified polymer will be consumed, approximately 1.7 tonnes will be collected as waste oil with the remainder, approximately 0.07 tonnes, being disposed of in a variety of ways, as described above, in a dispersed manner.

Combustion of the notified polymer will produce water and oxides of carbon.

Bioaccumulation of the notified polymer is not expected as its large molecular size is likely to inhibit membrane permeability and prevent uptake during exposure (Gobas et al., 1986).

9. EVALUATION OF TOXICOLOGICAL DATA

No toxicological data were provided.

10. ASSESSMENT OF ENVIRONMENTAL EFFECTS

No ecotoxicological data were provided.

11. ASSESSMENT OF ENVIRONMENTAL HAZARD

The notified polymer is unlikely to present a hazard to the environment during the reformulation process of Acryloid 3103. Spills are expected to be minimal, due to the closed process, and contained and collected for disposal.

Environmental exposure to the notified polymer may occur due to leaks and spillages during use. However, maintained machinery should have minimal leakage and significant release to the environment is not expected. Hazard to the environment is restricted by this limited release and the polymer's low water solubility.

12. ASSESSMENT OF PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY EFFECTS

No toxicological data were submitted for the notified polymer which is acceptable according to the Act for polymers of low concern with NAMW of greater than 1 000. The notified polymer has a number average (NAMW) of 49 000, which should preclude transmission across biological membranes such as skin and the gastrointestinal tract, and is therefore not expected to lead to significant toxicity. The notified polymer contains less than 1% of species with a NAMW of less than 500 and 1 000.

Two of the monomers have residual concentrations above 1% (w/w) but available toxicology data and the low percentages of the monomers present suggest they are unlikely to be of significant hazard (National Occupational Health and Safety Commission, 1994a; Sax & Lewis, 1996). On the basis of available data the remaining residual low molecular weight species are not expected to be hazardous. In addition the polymer is considered stable under normal use and storage conditions.

The public will not be exposed to the polymer during its importation and use in industry. Given the use pattern of products containing the notified polymer, high molecular weight and stability, the notified polymer represents a low risk to public health.

The notified polymer is imported as a product containing mineral oils. There is an atmospheric exposure standard specified for mineral oil mists of 5mg/m³ Time -Weighted Average (TWA) in the NOHSC *Exposure Standards for Atmospheric Contaminants in the Occupational Environment* (National Occupational Health and Safety Commission, 1995). Although mineral oil mist is not listed on the NOHSC *List of Designated Hazardous Substances* (National Occupational Health and Safety Commission, 1994b) it has the potential to cause irritation of the mucous membrane and upper respiratory tract. The base oils are present at high concentrations in the product but under the normal conditions of use it is unlikely that the exposure threshold would be achieved. It would be prudent however to limit possible inhalation exposure by means of the appropriate engineering controls.

There is a low risk associated with the introduction of the notified polymer as indicated by the requirements of the Polymer of Low Concern category under which it is to be introduced.

13. MATERIAL SAFETY DATA SHEET

The MSDS for the product to be imported (Acryloid 3103) 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.

14. RECOMMENDATIONS

To minimise occupational exposure to the notified chemical the following guidelines and precautions should be observed:

- Spillage of the notified chemical should be avoided. Spillage 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.

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

Australian and New Zealand Environment and Conservation Council (1991) Used lubricating oil: Generation, recovery and reuse in Australia Prepared by Technisearch Ltd for the Waste and Resources Committee (WRAC)., Project No.

Gobas FAPC, Opperhuizen A & Hutzinger O (1986) Bioconcentration of hydrophobic chemicals in fish: relationship with membrane permeation. Environmental Toxicology and Chemistry, 5 : 637-646.

National Occupational Health and Safety Commission (1994a) Approved Criteria for Classifying Hazardous Substances [NOHSC:1008(1994)]. Australian Government Publishing Service, Canberra.

National Occupational Health and Safety Commission (1994b) List of Designated Hazardous Substances [NOHSC:10005(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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Sax NI & Lewis RJ (1996) Dangerous Properties of Industrial Materials. Van Nostrand Reinhold, New York.