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3 October 2000

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME

FULL PUBLIC REPORT

Optiflo L100

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Director
Chemicals Notification and Assessment

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1. APPLICANT

Amtrade International Pty Ltd of Level 2, 570 St Kilda Rd, Melbourne VIC 3004 (ACN 006 409 936) has submitted a notification statement in support of their application for an assessment certificate for the synthetic polymer of low concern (PLC) Optiflo L100.

2. IDENTITY OF THE CHEMICAL

The chemical name, CAS number, molecular and structural formulae, molecular weight, spectral data and details of the polymer composition have been exempted from publication in the Full Public Report.

Marketing name: Optiflo L100

3. POLYMER COMPOSITION AND PURITY

Details of the polymer composition have been exempted from publication in the Full Public Report.

4. PLC JUSTIFICATION

The notified polymer meets the PLC criteria.

5. PHYSICAL AND CHEMICAL PROPERTIES

Property	Result	Comments
Appearance	white to slightly yellow coarse powder or flakes	
Melting point	50.0 – 59.7 ºC	softening point
Density	1040 kg/m^3	
Water solubility	> 200 g/L	the notifier states that the polymer is at least 20 % water soluble as this is the concentration of the imported

		solution
Particle size	similar to coarse sand	
Flammability	not flammable	flash point > 93 ºC
Autoignition temperature	not determined	not expected to autoignite
Explosive properties	not explosive	
Stability/reactivity	stable under normal environmental conditions	may undergo hydrolysis or pyrolysis under extreme pH or temperature
Hydrolysis as function of pH	not determined	see above
Partition coefficient	not determined	
Dissociation constant	no dissociable groups are present	

6. USE, VOLUME AND FORMULATION

Use:
The notified polymer will be used as an associative thickener in water based latex architectural paint formulations. The paints will be available for trade and public sale.

Manufacture/Import volume:
The notified polymer will be imported at a volume of approximately 20 tonnes per annum initially, increasing to approximately 200 tonnes per annum after five years.

Formulation details:
The notified polymer will be imported as a 20 % (w/v) aqueous solution. The polymer solution will be imported in 200 L steel drums. The solution will be reformulated by a number of customers, by mixing with paint components such as aqueous latexes and pigments, to produce finished paints containing 0.2 – 0.6 % notified polymer. The finished paint will be packaged for trade and retail sale. A range of paint producers may use the notified polymer, but it is probable that the finished paints will be packaged in retail containers such as 1 L and 4 L cans and 20 L pails.

7. OCCUPATIONAL EXPOSURE

Exposure route	Exposure details	Controls indicated by notifier
Formulation		
Paint manufacture and filling (10 - 300 workers, 2 - 8 h/day, daily)		
dermal 20 % solution	workers may be exposed to drips and spill of polymer solution while connecting and disconnecting	exhaust ventilation; enclosed pumping and mixing system impervious gloves, coveralls and

	transfer hoses and cleaning mixing equipment, also during sampling and testing	goggles; respiratory protection if mists are generated
End use		
Retail workers (100 - 1000 workers, daily)		
dermal, < 1 % solution	exposure to drips and spills of the finished paint may occur during tinting at point of sale	none
Trade use (a large number of workers on a daily basis)		
dermal, < 1 % solution	exposure to drips and spills of the finished paint may occur during application	none
Transport and storage *(20 - 50 workers, 4 - 6 h/day, 20 –40 days/year)*		
none 20 % solution	handling sealed drums; no exposure expected except in case of accident	none

8. PUBLIC EXPOSURE

The finished paints containing the notified polymer will be sold on the retail market. There will be widespread public exposure to the notified polymer in this form. Handling and disposal of the paints containing the notified polymer will be in the typical manner. Exposure by the dermal route is likely during the short periods in which the paints are likely to be used by home decorators.

9. ENVIRONMENTAL EXPOSURE

9.1. Release

There is potential for release at all stages of the reformulation process. The notifier estimates that up to approximately 6 tonnes per year of notified polymer (3 % of the total import volume) will end up as waste resulting from minor spills, the cleaning of formulation equipment and rinsing out of the transport drums. Liquid wastes will be processed to reclaim solvents and the solid residue containing the notified polymer will be disposed of to landfill. In the event of major spills, the solution containing the notified polymer would be contained within the plant by bunding and collected by absorbent material. The residue would be treated to form an inert solid which would be disposed of to landfill.

The notifier has estimated that up to 5 % of the notified polymer (maximum of 10 tonnes per annum) will be disposed of to landfill by the general public. It is common practice to catch paint spills on paper or cloth sheets that will be eventually disposed of to landfill. Paint containers and residues will also be disposed to landfill.

Some of the polymer will be released to sewers following washing of painting equipment by the general public. The amount to be released to the sewers via these means is estimated at 2.5 % (maximum of 5 tonnes per annum).

9.2. Fate

Once applied to the surfaces of houses as a coating, the notified polymer will be incorporated in a durable, inert film and should not present a significant hazard. Any fragments, chips and flakes of the paint will be of little concern as they are expected to be inert.

Most of the solid waste generated in the formulation and application of the coating will be disposed of to landfill. The containers and paint residues will also be disposed of in this manner. Waste polymer sent to landfill as a dry solid is expected to remain associated with the soils and sediments and would not be expected to leach into the aquatic environment when bound into the paint matrix. However, leaching of the uncured polymer from landfill sites is likely, given the water solubility/dispersibility of the substance. Although the polymer is unlikely to be classed as readily biodegradable, it is expected to slowly degrade to water, carbonate and nitrate or ammonia in landfill or waterways.

Presumably only notified polymer waste produced during the cleaning of the paint application equipment (brushes, rollers and possibly spray equipment) will be washed into sewers (at a maximum of approximately 5 tonnes per annum) with copious amounts of water. The polymer is water soluble/dispersible, and could persist in solution as it will most likely be present in concentrations far below its saturation point. Distribution of the final paint product is expected to be wide-spread, causing further dispersion of the notified polymer in the sewer systems.

By analogy to polyethyleneglycols (Verschueren, 1996), the notified polymer released to the environment is not expected to degrade (hydrolyse) and should persist in the aqueous compartment.

The polymer is not expected to cross biological membranes, due to the high molecular weight, and should not bioaccumulate (Connell, 1990).

10. EVALUATION OF HEALTH EFFECTS DATA

No toxicological data were submitted.

No residual monomers, hazardous impurities, additives and adjuvants are present at concentrations where they may present a hazard in the use of the notified polymer.

11. EVALUATION OF ENVIRONMENTAL EFFECTS DATA

No ecotoxicological data were submitted.

12. ENVIRONMENTAL HAZARD (RISK) ASSSESSMENT

The majority of the notified polymer will be applied to various substrates and cured into a solid paint coating. The polymer will share the fate of these substrates, with eventual disposal to landfill or by incineration. Disposal to landfill is unlikely to present a hazard to the environment, as the notified polymer will be contained in a solid matrix that is not expected to biodegrade or leach.

From the notifier's estimates, paint formulation and application will result in up to approximately 16 tonnes per year of notified polymer being disposed of to landfill as solid waste. The solid residues should remain associated with the soil and sediment due to the high molecular weight and the stability of the cured paint matrix. However, given the water solubility of the notified polymer, uncured polymer may prove mobile in landfill.

In addition, up to 5 tonnes per year will be released to the sewers as aqueous waste. The fate of the aqueous residues released to the sewer system is harder to predict as the high water solubility of the polymer will allow it to stay in solution at low concentrations where it should not hydrolyse. As the notified polymer should only be released to the sewer through cleaning of brushes, rollers and trays following paint application and taking into account the expected widespread distribution on the final paint product to the general public, the impact to an individual sewer system cannot be estimated.

Based on use throughout Australia and assuming an average use of 2 L of the final paint products with 50 mL of paint remaining on rollers (equating to ~2.5 % of the notified chemical) following paint application, the Predicted Environmental Concentration (PEC) would be:

Amount released to sewer per annum:	5 tonnes
Population of Australia:	18 million
Volume of water/person/day:	150 L
PEC in sewer:	5.07 µg/L
Dilution factor in receiving water:	1:10
PEC in receiving water:	0.5 µg/L

Nonionic polymers tend not to be toxic to the aquatic compartment (Boethling, 1997) and as the notified polymer will be heavily diluted and widely distributed, it is not expected to impact on the environment.

The main environmental hazard would arise through spillage in transport accidents that may release large quantities of the polymer to drains and waterways. It is not possible to predict the behaviour of the polymer in the natural aquatic environment.

The low environmental exposure of the polymer as a result of the proposed use indicates the overall environmental hazard should be low.

13. HEALTH AND SAFETY RISK ASSESSMENT

13.1. Hazard assessment

No toxicological information has been provided for the notified polymer and therefore the substance cannot be assessed against the NOHSC *Approved Criteria for Classifying*

Hazardous Substances (NOHSC, 1999). Due to the high molecular weight and low reactivity of the polymer, the toxicological hazard of the notified polymer is expected to be low. The polymer is not expected to be hazardous by dermal exposure as the high molecular weight will preclude absorption through the skin.

The Material Safety Data Sheet (MSDS) indicates that the product Optiflo Associative Thickener (No Cosolvent) is not classified as a hazardous substance but indicates that eye, skin and mucous membrane irritation may occur on exposure to this product, due to the alkaline nature of the product (pH typically 9.5), along with dermatitis due to the defatting effect of repeated exposure to alkaline solutions. The residual monomer concentrations in the finished polymer are below the cutoff levels for classification as a hazardous substance.

13.2. Occupational health and safety

There is little potential for significant occupational exposure to the notified polymer in the transport and storage of the polymer solution or the paint component containing this polymer. There will be exposure during production of paints, and in the use and disposal of the paints.

During the paint manufacture processes, the main exposure route for the notified polymer will be dermal. The paints will be viscous, and ready formation of aerosols is not expected. The polymer is not expected to be hazardous by dermal exposure as the high molecular weight will preclude absorption through the skin, however irritation may occur on dermal exposure to the product Optiflo Associative Thickener (No Cosolvent) due to the alkaline nature of the product. The notified polymer is also not expected to be hazardous by ocular exposure, but precautions should be taken to prevent ocular exposure to the product Optiflo Associative Thickener (No Cosolvent) due to the alkaline nature of the product. The engineering controls and personal protective equipment specified in the notification (impervious gloves, safety goggles and coveralls) will provide a high level of protection against the notified polymer. The MSDS indicates that the gloves should be composed of butyl rubber, nitrile rubber or neoprene. No significant OHS risks are expected when control and protective measures are implemented.

Occupational exposure during the sale and professional use of architectural paints is likely to be widespread and often under poorly controlled conditions. Dermal contact during handling and application of the paints is likely. The occupational health and safety risk associated with dermal contact with the notified polymer in the form of uncured paints will be low, due to the low toxicological hazard of the polymer and the low concentration (< 1 %) in the finished paints.

Conclusion

Optiflo L100 is of low concern to human health and safety and no specific risk reduction measures are necessary.

13.3. Public health

While dermal and possibly eye contact with the notified polymer may occur during application of the paints containing the polymer by the general public, based on its expected low toxicity, the notified polymer is not expected to pose a significant hazard to public health when used in the proposed manner.

In dried paint films, the notified polymer will be encapsulated in an inert, very high molecular weight matrix, which will render it biologically unavailable, and consequently public exposure to the notified polymer from dried paint films is considered to be low.

14. MSDS AND LABEL ASSESSMENT

14.1. MSDS

The MSDS of the notified polymer solution provided by the notifier was in accordance with the NOHSC *National Code of Practice for the Preparation of Material Safety Data Sheets* (NOHSC, 1994a). It is published here as part of the assessment report. The accuracy of the information on the MSDS remains the responsibility of the applicant.

14.2. Label

The label for the notified polymer solution provided by the notifier was in accordance with the NOHSC *National Code of Practice for the Labelling of Workplace Substances* (NOHSC, 1994b). The accuracy of the information on the label remains the responsibility of the applicant.

15. RECOMMENDATIONS

To minimise occupational exposure to Optiflo L100, the following guidelines and precautions should be observed:

- Protective eyewear, chemical resistant industrial clothing and footwear and impermeable gloves (composed of butyl rubber, nitrile rubber or neoprene) should be used during occupational use of the products containing the notified polymer; where engineering controls and work practices do not reduce vapour and particulate exposure to safe levels, an air fed respirator should also be used;
- 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.

If products containing the notified chemical are hazardous to health in accordance with the NOHSC *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 1999), workplace practices and control procedures consistent with State and Territory hazardous substances regulations must be in operation.

Guidance in selection of protective eyewear may be obtained from Australian Standard (AS) 1336 (Standards Australia, 1994) and Australian/New Zealand Standard (AS/NZS) 1337 (Standards Australia/Standards New Zealand, 1992); for industrial clothing, guidance may be found in AS 3765.2 (Standards Australia, 1990); for impermeable gloves or mittens, in AS

2161.2 (Standards Australia/ Standards New Zealand, 1998); for occupational footwear, in AS/NZS 2210 (Standards Australia/ Standards New Zealand, 1994a); for respirators, in AS/NZS 1715 (Standards Australia/ Standards New Zealand, 1994b) and AS/NZS 1716 (Standards Australia/ Standards New Zealand, 1994c).

16. REQUIREMENTS FOR SECONDARY NOTIFICATION

Secondary notification may be required if:

(i) any of the circumstances stipulated under subsection 64(2) of the Act arise. If any importer or manufacturer of (the notified chemical) becomes aware of any of these circumstances, they must notify the Director within 28 days; or

(ii) the notified polymer is introduced in a chemical form that does not meet the PLC criteria.

17. REFERENCES

R S Boethling and J V Nabholz (1997) Environmental Assessment of Polymers Under the U.S. Toxic Substances Control Act. In J D Hamilton and R Sutcliffe, (Eds) Ecological Assessment of Polymers. Van Nostrand Reinhold, New York, USA.

Connell D. W. (1990) General characteristics of organic compounds which exhibit bioaccumulation. In Connell D. W., (Ed) Bioaccumulation of Xenobiotic Compounds. CRC Press, Boca Raton, USA.

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National Occupational Health and Safety Commission (1999) Approved Criteria for Classifying Hazardous Substances [NOHSC:1008(1994)]. Australian Government Publishing Service, Canberra.

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

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.

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Standards Australia/Standards New Zealand (1998) Australian/New Zealand Standard 2161.2-1998, Occupational protective gloves, Part 2: General requirements. Standards Association of Australia/Standards Association of New Zealand.

K. Verschueren (1996) Handbook of Environmental Data on Organic Chemicals. John Wiley and Sons, Inc., New York, USA.