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NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME

FULL PUBLIC REPORT

Polymer in 1144S Valueshade #4

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Director
Chemicals Notification and Assessment

FULL PUBLIC REPORT

Polymer in 1144S Valueshade #4 Uro Primer.

1. APPLICANT

DuPont (Australia) Ltd of 49-59 Newton Road WETHERILL PARK NSW 2164 has submitted a notification statement in support of their application for an assessment certificate for Polymer in 1144S Valueshade #4 Uro Primer.

2. IDENTITY OF THE CHEMICAL

The notified polymer is considered not to be hazardous based on the nature of the chemical and the data provided. The chemical name, CAS number, molecular and structural formulae, molecular weight, spectral data, details of the polymer composition and details of exact import volume and customers have been exempted from publication in the Full Public Report and the Summary Report.

Trade Name:	1144VS Valushade #4 Uro Primer
Number-Average Molecular Weight (NAMW):	< 10 000
Maximum Percentage of Low Molecular Weight Species	
Molecular Weight < 500:	< 2 %
Molecular Weight < 1 000:	< 5 %
Method of Detection and Determination:	NAMW determined using gel permeation chromatography (GPC); identification of polymer by fourier transform infrared spectroscopy (FTIR)

3. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa:	viscous clear liquid (xylene solvent)
Melting Point:	not determined – see comments below
Boiling Point:	decomposes before boiling at ~ 180°C

Density:	1.05 -1.15 kg.L^{-1}
Vapour Pressure:	not determined
Water Solubility:	not determined (see comments below)
Charge Density:	~ one acid group per 4 700 MW
Particle Size:	polymer is manufactured as a solution polymer
Flash Point:	not determined
Flammability Limits:	not determined since the flammability limits of the solvent phase will be greater than that of the polymer
Autoignition Temperature:	> 250°C
Explosive Properties:	not explosive
Reactivity/Stability:	free hydroxy groups react with suitable groups ie isocyanates

Comments on Physico-Chemical Properties

The polymer is amorphous and does not have a melting point. The polymer does not have a boiling point as it decomposes before boiling.

Water solubility has not been determined. However, the notifier claims that based on the high percentage of hydrophobic aromatic and aliphatic groups, and by analogy with similar acrylics, the water solubility will be very low (< 1ppm). Additionally, any free hydroxy groups of the polymer will react with isocyanate ends of polymeric isocyanates (added immediately prior to application of primer) to form an inert film of ultra high molecular weight during the curing of the primer.

The polymer is stable under normal conditions of use. It will not hydrolyse, undergo thermal or photo-degradation, or depolymerization.

4. PURITY OF THE CHEMICAL

Degree of Purity: > 99%

Non-hazardous Impurities
(> 1% by weight): none

Maximum Content
of Residual Monomers: < 1%

5. USE, VOLUME AND FORMULATION

The notified polymer will not be manufactured in Australia. It will be imported as a less than 20% component of a organic solvent-based primer for the automotive refinishing industry for use by professional spray painters.

The primer will be imported in 2 and 4 L cans for direct sale to distributer outlets.

6. OCCUPATIONAL EXPOSURE

The notified polymer is imported as a component of primer. The primer will be applied at professional spray shops throughout Australia where it will be mixed with other paint ingredients, including a polymeric isocyanate curing agent/hardener immediately prior to application to give a primer-filler. Primer-filler mixing and application are to be undertaken in spray booths with exhaust extraction. The primer-filler applied to cars will contain a maximum of 15% of the notified polymer. After application the primer-filler is either allowed to air dry for 3 to 4 hours or force dried at 60°C for 30 min. Dermal exposure to the paint containing the notified polymer may occur when mixing with the curing agent and during application. The use of conventional spray booths is likely to control exposure by the dermal and inhalational routes.

7. PUBLIC EXPOSURE

The notified polymer will not be sold to the public. It will be used by industrial customers only. There is little potential for public exposure to the notified polymer during import, transport, preparation or coating, or use of the coated vehicles. Minor public exposure to the notified chemical may result from accidental spillage during transport, but this will be limited due to the small size of the containers.

8. ENVIRONMENTAL EXPOSURE

Release

Waste paint containing the notified polymer may be generated in several ways. These include, unused/leftover paint produced after mixing with thinners, hardener, etc, and paint retained in spray equipment. Such paint, if not used when mixed, will be disposed of to a waste drum. This material (totaling up to 10% of total paint volume) is typically sent to a waste disposal company for solvent recovery. The resulting solidified residue is taken to State Waste Management Centres for consignment to landfill or incineration.

Overspray is caught in spray booth filters and may constitute 30 to 70% of total paint sprayed. Solid residues are trapped in filters that are eventually disposed of (typically every three months) to landfill or by incineration.

In approximately 30% of spray shops, a "wet floor" arrangement is used in place of or in combination with dry filters. In this instance, a water trap is used to catch overspray. Periodically (typically every three months), water from the trap is collected by a waste disposal company for treatment. This treatment usually involves flocculation or centrifugation of the suspended material that is then taken to State Waste Management Centres and either consigned to landfill or incinerated.

Once cured, the primer will be painted with basecoats and topcoats. The painted vehicles are baked to cure the polymer into a paint film. The cross-linked polymer will be effectively inert and be eventually disposed of with the vehicles. Releases of the cured polymer during vehicle repairs will be diffuse and limited to small quantities of the cured polymer.

During transport, the risk of environmental release is limited to accidents where the drums containing the polymer are ruptured, releasing a maximum of 700 mL per can of the notified polymer.

Fate

The low water solubility of the notified polymer indicates leaching from landfill sites is not expected. Any incineration of the notified polymer is expected to produce water and oxides of carbon and nitrogen.

The majority of the notified polymer is not expected to be released to the environment until it has been cured into a solid polymer matrix which will be over-coated with base-coats and top-coats. The resultant matrix structure should limit the hydrolysis or biodegradation of the polymer and the over coating will minimise environmental exposure. Bioaccumulation of the polymer is unlikely due to the high molecular weight of the polymer even before curing (Connell, 1989).

9. EVALUATION OF TOXICOLOGICAL DATA

No toxicological data were provided. This is acceptable for polymers of low concern with a NAMW greater than 1 000 according to the *Industrial Chemicals (Notification and Assessment) Act 1989.*

10. ASSESSMENT OF ENVIRONMENTAL EFFECTS

No ecotoxicological data were provided, This is acceptable for polymers of low concern with a NAMW greater than 1 000 according to the *Industrial Chemicals (Notification and Assessment) Act 1989.*

11. ASSESSMENT OF ENVIRONMENTAL HAZARD

Disposal of the notified polymer to landfill (up to 80% of imported polymer as either an inert solid or cured paint largely from paint overspray) is unlikely to present a hazard to the environment. It will be in a solid matrix and is not expected to biodegrade or leach.

The main environmental hazard would arise through spillage in transport accidents that may release small quantities of the uncured polymer to drains and waterways. However, the polymer would quickly become immobile on association with soil/sediment layer.

The low environmental exposure of the polymer as a result of the proposed use, together with its expected low environmental toxicity, indicate the overall environmental hazard should be low.

12. ASSESSMENT OF PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY EFFECTS

The notified polymer has been notified as a synthetic polymer of low concern under section 23 for the purposes of section 24A of the Act. The polymer meets the criteria for a synthetic polymer of low concern specified in regulation 4A of the Act and therefore is considered of low hazard to human health.

Residual chemicals in the notified polymer are below the hazardous substances cut-off concentrations for health effects adopted by the National Occupational Health and Safety Commission.

The notified polymer is imported as an ingredient in a finished primer. The finished primer is classified as hazardous according to the National Occupational Health and Safety Commission Approved Criteria (National Occupational Health and Safety Commission, 1994a) due to the presence xylene, ethylbenzene and methyl amyl ketone. Although exposure to the notified polymer is not of concern to human health, exposure to other ingredients in the primer formulation should be avoided. The following exposure standards should be observed for the various ingredients (National Occupational Health and Safety Commission, 1995):

ingredient	TWA[1]	STEL[2]
Methyl amyl ketone	50 ppm; 205mg.m^{-3}	75 ppm; 307mg.m^{-3}
ethylbenzene	100 ppm; 434 mg.m^{-3}	125 ppm; 543 mg.m^{-3}
Carbon black	3 mg.m^{-3}	
Barium sulfate	10 mg.m^{-3}	None allocated
Zinc phosphate	10 mg.m^{-3}	None allocated
Xylene	80 ppm; 350 mg.m^{-3}	150 ppm; 655 mg.m^{-3}

[1]Time weighted average.
[2]Short term exposure limit.

In addition, the exposure standards for isocyanates (National Occupational Health and Safety Commission, 1995) (TWA 0.02 mg.m^{-3}; STEL 0.07 mg.m^{-3}) should be observed during mixing of the primer with the curing agent, and during application.

There is negligible potential for public exposure to the notified polymer arising from importation, formulation and industrial application in automotive undercoats. Similarly, the potential for public exposure to the notified polymer during transport or disposal of waste after a spill is very small. Although the public may come into contact with vehicles undercoated with paints containing the notified polymer, it will be cross-linked in an insoluble matrix.

13. RECOMMENDATIONS

To minimise occupational exposure to the notified polymer good industrial hygiene practices should be observed. However, as the notified polymer is an ingredient in an imported primer paint determined to be hazardous under NOHSC approved criteria, the following guidelines and precautions should be observed when engineering controls are not sufficient:

- 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);
- 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, 1994b);
- Respirators should conform to AS/NZS 1716 (Standards Australia/Standards New Zealand, 1994a).
- Spillage of the notified chemical should be avoided. Spillages should be cleaned up promptly with absorbents which should be put into containers for disposal;

- Engineering controls should be sufficient to meet exposure standards as determined by NOHSC for various ingredients in the primer and the isocyanate hardeners (National Occupational Health and Safety Commission, 1995).
- Good personal hygiene should be practised to minimise the potential for ingestion;
- A copy of the Material Safety Data Sheet (MSDS) should be easily accessible to employees.

14. MATERIAL SAFETY DATA SHEET

The MSDS for the formulation containing 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, 1994b).

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

Connell DW (1989) General characteristics of organic compounds which exhibit bioaccumulation. In: D. W. Connell ed. Bioaccumulation of Xenobiotic Compounds. CRC Press, Boca Raton. .

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

National Occupational Health and Safety Commission (1995) Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment, [NOHSC:1003(1995)]. In: ed. Exposure Standards for Atmospheric Contaminants in the Occupational Environment: Guidance Note and National Exposure Standards. Australian Government Publishing Service, Canberra, .

Standards Australia (1978) Australian Standard 2161.2-1998, Industrial Safety Gloves and Mittens (excluding electrical and medical gloves). Sydney, Standards Association of Australia.

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

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

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

Standards Australia/Standards New Zealand (1994a) Australian/New Zealand Standard 1716-1994, Respiratory Protective Devices. Sydney/Wellington, Standards Association of Australia/Standards Association of New Zealand.

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