

File No: PLC/184

August, 2000

**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION
AND ASSESSMENT SCHEME**

FULL PUBLIC REPORT

RCZ 98961

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Director
Chemicals Notification and Assessment

FULL PUBLIC REPORT**RCZ 98961****1. APPLICANT**

DuPont (Australia) Ltd of 49-59 Newton Road, Wetherill Park, NSW 2164 (ACN 000 716 469) has submitted a notification statement in support of their application for an assessment certificate for the synthetic polymer of low concern (PLC) 184.

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.

Number-average Molecular Weight: >1000

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

The polymer was never isolated as a defined entity and the data provided were for RCZ98961 as a polymer solution with 50% butyl acetate.

Property	Result	Comments
Appearance	Yellow semi-viscous liquid	
Boiling point	Not determined	Decomposition will start at temperatures in excess of 250°C.

Density	1010 kg/m ³	
Water solubility	Not determined	Expected to be low due to high molecular weight and predominate hydrophobicity. The lack of polar functionality supports the expectation of low water solubility (< 1 mg/L).
Particle size	Not determined	Polymer is always in solution
Flammability	Combustible	
Autoignition temperature	425°C	
Explosive properties	Not explosive	
Stability/reactivity	Stable for storage up to 120°C. As an organic material, the polymer will react with oxidising agents.	
Hydrolysis as function of pH	Not determined	Polymer contains ester linkages that could be expected to undergo hydrolysis under extreme pH conditions. However, due to expected low water solubility, this is unlikely in the environmental pH range of between 4 and 9.
Partition coefficient	Not determined	See comments below
Adsorption/desorption	Not determined	Determination of adsorption/desorption was not conducted due to low water solubility. The polymer is expected to become associated with the organic component of soils and sediments.
Dissociation constant	Not determined	

5.1 Comments on physical and chemical properties None

6. USE, VOLUME AND FORMULATION

Use:

The polymer will be used as a component of an automotive primer paint.

Manufacture/Import volume:

The notified polymer will be imported at a rate of less than 20 tonnes/year for the first 5 years.

Formulation details:

The notified polymer is a component of a 2-part automotive paint at <10%. The paint will be imported in 3.78 L (1 US gallon) steel cans ready for end-use.

7. OCCUPATIONAL EXPOSURE

Exposure route	Exposure details	Controls indicated by notifier
<i>Transport and storage</i>		
<i>Transport from wharf to warehouse</i>		
Skin, eyes, respiratory system	Exposure resulting from accidental puncture of containers	None specified
<i>Transport from warehouse to customers</i>		
Skin, eyes, respiratory system	Exposure resulting from accidental puncture of containers	None specified
<i>End use – Spray Painting (3,800 workers, 8hours/day, 200days/year)</i>		
<i>Weighing and mixing with activator prior to application</i>		
Skin and eyes	Possible spillage during handling; <10% polymer in primer and paint mix	General ventilation, safety glasses, gloves, overalls.
<i>Spray Application</i>		
Skin, eyes, respiratory system	Exposure to paint mix and aerosols during paint application; <10% in paint mix	Spray booth, supplied air respirator, faceshield, gloves and protective coveralls.
<i>Cleanup</i>		
Skin, eyes, respiratory system	Possible spillage during handling; exposure to paint mix and aerosols during spray cleaning; <10% in paint mix	General ventilation, safety glasses, gloves and protective coveralls.
<i>Disposal</i>		
<i>Disposal of residual paint</i>		
Skin, eyes	Possible spillage of paint residues	None specified
<i>Washing and recycling of containers</i>		
Skin, eyes	Possible spillage of rinsate	None specified

8. PUBLIC EXPOSURE

The notified polymer is intended for use by professional automotive spray painters only and will not be sold to the public. Following application, the primer is covered by 1-3 topcoats of paint and so direct exposure of the public to the primer would be expected to be extremely limited.

9. ENVIRONMENTAL EXPOSURE

9.1. Release

There is potential for release of the notified polymer during the spray paint preparation and the paint application. The paint is applied to automotive surfaces with approximately 50-80% efficiency in spray booths with control measures, such as a filtering system and masking materials, in place. Cleaning of the spray gun and mixing equipment will generate waste that will be collected and disposed of in the same manner as wastewater from the spray booth.

During coating application it is expected that up to 10 tonnes/annum of notified polymer waste will be produced.

Some product residue will also remain in the 'empty' containers after use. It is estimated that up to 1 tonne of the notified polymer, 5% of the container contents, will remain as residue in the 'empty' import containers.

A further 10% of the notified polymer may be lost due to cleaning of the spray and mixing equipment.

9.2. Fate

Once applied to the metal panels of motor vehicles the notified polymer will be incorporated in a water resistant film and will not present a significant hazard. Any fragments, chips and flakes of the coating will be of little concern as they are expected to be inert. The notifier does not comment on the fate of the metal panels coated with the polymer, but they are likely to be either recycled for steel reclamation or placed into landfill at the end of their useful life. When recycled the polymer would be incinerated in the blast furnaces and converted to water vapour and oxides of carbon.

The solid waste generated in the formulation and application of the coating will be disposed to landfill. The product when sprayed will react with an activator, resulting in all overspray being crosslinked and becoming inert due to the very high molecular weight. The containers and their residue will also be disposed to landfill, with the paint expected to dry out to a hard residue. Leaching of the notified polymer from landfill sites is unlikely, given the expected low solubility of the substance and very high molecular weight. Under these conditions, the notified polymer waste would be very slowly degraded to gases such as carbon dioxide through the agency of abiotic and bacteriological processes.

Mixing containers and spray equipment will be washed with solvent that is collected and sent to solvent recycling. The resulting dried solid residues will be disposed to landfill or combined with asphalt to be used as road base tackifier.

The notified polymer is not expected to cross biological membranes, due to the expected low solubility, high molecular weight and strong adsorption to soil, and as such should not bioaccumulate (Connell, 1989).

10. EVALUATION OF HEALTH EFFECTS DATA

No toxicological data were submitted.

The health hazards of the constituents and hazardous impurities, additives and adjuvants are tabulated below.

Chemical	Health hazards	Regulatory controls
Constituents		
Identities of residual monomers have been exempted from publication in the Full Public Report	All are present below cutoffs for classification of the polymer as hazardous	
Hazardous impurities		
None	None	
Additives/adjuvants		
n-Butyl acetate	Irritating to eyes, respiratory system and skin; disturbs central nervous system (HSDB, 1999)	Exposure standards 150ppm TWA; 200ppm STEL (NOHSC, 1995)

11. EVALUATION OF ENVIRONMENTAL EFFECTS DATA

No ecotoxicological data were submitted.

12. ENVIRONMENTAL HAZARD (RISK) ASSESSMENT

The notified polymer crosslinks with other paint components to form a very high molecular weight water resistant film that is stable to light and temperature. The notified polymer, as part of this surface coating will share the fate of the vehicle panel. When the vehicle panel is recycled, the notified polymer would be destroyed through incineration.

No repackaging of the notified polymer occurs and it will only be supplied to licensed professional spray painters who will formulate with activator on site directly prior to use. Overspray will be captured and disposed of to landfill as will paint residues in empty cans.

Equipment residues will be washed with solvent and sent for solvent recycling with solid residues disposed to landfill or combined with asphalt to be used as road base tackifier. The notifier estimates that up to 10 tonnes of the notified polymer will be released to the environment from the application process. The paint film will contain the notified polymer as part of a crosslinked polymer matrix. The final fate of the notified polymer will presumably be the same as the final fate of the vehicle, either to landfill or to recycling where the polymer will be incinerated to water vapour and oxides of carbon.

In the event of accidental spillage of the polymer solution into waterways the polymer is not expected to disperse into the water, but settle out onto sediments. If the polymer is spilt on land, either during usage or transport, it is expected to immobilise in the soil layer. Contaminated soil can then be collected and disposed to landfill. The small container sizes would also limit any hazard in the event of a spill.

Given the above, environmental exposure and the overall environmental hazard is expected to be low.

13. HEALTH AND SAFETY RISK ASSESSMENT

13.1. Hazard assessment

No toxicological data have been provided for the notified polymer. However, the systemic toxicity of the notified polymer is likely to be low, given its high molecular weight and consequent low bioavailability. Based on the submitted data, the substance would not be classified as a hazardous substance in accordance with the NOHSC Approved Criteria for Classifying Hazardous Substances (National Occupational Health and Safety Commission, 1999b).

Because of the presence of solvents, the primer paint containing the notified polymer is classed as a Class 3 dangerous good (flammable liquid). Also, the material safety data sheet (MSDS) for the paint lists a number of health effects pertaining to the solvents. These include skin, eye and respiratory system irritation, contact dermatitis, dizziness, headache, muscular weakness, drowsiness and kidney, liver and central nervous system dysfunction.

13.2 Occupational health and safety

The primer paint containing the notified polymer will be imported in steel cans which will remain unopened prior to end use. Thus, there is little potential for significant occupational exposure to the notified polymer during import and storage of the paint containing the polymer. Therefore, the health risk to workers involved in transport and storage is low.

The paint coating will be sold to numerous automotive repair customers. Spray painters will mix the paint with an activating agent before applying the catalysed mixture to automotive components. Although the notified polymer is unlikely to be classifiable as a hazardous substance, both the paint and activator contain a number of hazardous solvents which may be encountered during paint preparation and cleanup. Also, the spraypainting procedure itself produces a dense aerosol of particles which, if inhaled, may impact on human health even in the absence of hazardous solvents and other components.

During paint preparation, worker exposure to the solvents and to a lesser extent the notified polymer should be limited through a combination of engineering controls and personal protective equipment. Paint mixing stations should be well ventilated and personal protective equipment consisting of protective coveralls gloves and eye protection should be worn. If ventilation is insufficient to maintain atmospheric levels of solvents below national exposure limits (National Occupational Health and Safety Commission, 1995), an organic respirator should also be worn.

Exposure to paint components including the notified polymer during spray applications should be limited by engineering controls consisting of ventilated spray booths and personal protective equipment consisting of supplied air respirator, faceshield, gloves and protective coveralls. These controls are to conform to the relevant Australian Standards or their recognised equivalent. In this way it is important that the paint is applied and overspray controlled in a manner conforming to appropriate occupational health and safety regulations such as the NOHSC *Spray Painting National Guidance Material* (National Occupational Health and Safety Commission, 1999c). Finally, similar engineering controls and personal protective equipment should be employed during the cleaning of spray equipment when solvents alone are likely to be sprayed to remove residual paint. Employers must ensure that the exposure standards for the solvents are adhered to also during spray application and cleanup.

The paint components containing the notified polymer are flammable due to their solvent content. Precautions must be taken to avoid sources of ignition. The use of earthing leads and antistatic overalls and footwear is recommended.

Given these engineering controls and personal protective equipment and accounting for the likely low toxicity of the notified polymer, the health risk for these workers involved in spray painting is considered low.

Following curing of the paint, the polymer will be cross-linked with other paint components to form a high molecular weight stable film. In this form, the polymer is unavailable for absorption and the health risk to workers from the notified polymer after paint curing would be negligible.

Overall, RCZ 98961 is of low concern to human health and safety and no specific risk reduction measures are necessary.

13.3. Public health

Based on the expected low public exposure to the notified polymer and its expected low toxicity, it is considered that the notified polymer will not pose a significant risk to public health when used in the proposed manner.

14. MSDS AND LABEL ASSESSMENT

14.1. MSDS

The MSDS for the product containing the notified polymer provided by the notifier was in accordance with the NOHSC *National Code of Practice for the Preparation of Material*

Safety Data Sheets (National Occupational Health and Safety Commission, 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 product containing the polymer provided by the notifier was in accordance with the NOHSC *National Code of Practice for the Labelling of Workplace Substances* (National Occupational Health and Safety Commission, 1994b). The accuracy of the information on the label remains the responsibility of the applicant.

15. RECOMMENDATIONS

To minimise occupational exposure to RCZ 98961, the following guidelines and precautions should be observed:

- Spray application of the paint containing the notified polymer should be conducted in accordance with the NOHSC *Spray Painting National Guidance Material* (National Occupational Health and Safety Commission, 1999c);
- Protective eyewear, chemical resistant industrial clothing and footwear and impermeable gloves 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 organic filter respirator or air fed respirator should also be used;
- Spillage of the notified polymer 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 polymer are hazardous to health in accordance with the NOHSC *Approved Criteria for Classifying Hazardous Substances* (National Occupational Health and Safety Commission, 1999b), workplace practices and control procedures consistent with State and territory hazardous substances regulations must be in operation. In particular, exposure standards for product components must be adhered to in the workplace.

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 polymer) 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

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

HSDB (1999) Hazardous Substances Database, Micromedex Inc.

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National Occupational Health and Safety Commission (1994b) National Code of Practice for the Labelling of Workplace Substances [NOHSC:2012(1994)]. Australian Government Publishing Service, Canberra.

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

National Occupational Health and Safety Commission (1999a) List of Designated Hazardous Substances [NOHSC:10005(1999)]. Australian Government Publishing Service, Canberra.

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

National Occupational Health and Safety Commission (1999c) National Guidance Material for Spray Painting. Canberra, Australian Government Printing Service.

Standards Australia (1990) Australian Standard 3765.2-1990, Clothing for Protection against Hazardous Chemicals Part 2 Limited protection against specific chemicals. Standards Association of Australia.

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.

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

Standards Australia/Standards New Zealand (1994b) Australian/New Zealand Standard 1715-1994, Use and Maintenance of Respiratory Protective Devices. 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.