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**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION
AND ASSESSMENT SCHEME**

FULL PUBLIC REPORT

RC 25433

This Assessment has been compiled in accordance with the provisions of the *Industrial Chemicals (Notification and Assessment) Act* 1989 (the Act) and Regulations. This legislation is an Act of the Commonwealth of Australia. The National Industrial Chemicals Notification and Assessment Scheme (NICNAS) is administered by the National Occupational Health and Safety Commission which also conducts the occupational health & safety assessment. The assessment of environmental hazard is conducted by the Department of the Environment and the assessment of public health is conducted by the Department of Health and Ageing.

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Copies of this full public report may also be requested, free of charge, by contacting the Administration Coordinator on the fax number below.

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FULL PUBLIC REPORT

RC 25433

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) RC 25433.

2. IDENTITY OF THE CHEMICAL

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

Marketing names: RC25433, RCP25433

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

No test reports were provided for the determination of physico-chemical properties.

The polymer is not isolated from solution. The following physico-chemical properties are for the polymer solution containing >99% notified polymer, unless otherwise stated.

Property	Result	Comments
Appearance	Clear to light yellow semi viscous solution	
Melting point	Not applicable	The polymer is not isolated from solution.
Density	990 kg/m ³	
Water solubility	Not determined	The notified polymer is expected to have negligible water solubility based on its high molecular weight and predominantly hydrophobic character.
Particle size	Not applicable	The polymer is not isolated from solution.
Flammability	Lower Limit = 1.0% Upper Limit = 11.5%	The polymer is a combustible solid.
Autoignition temperature	515°C	
Explosive properties	Not determined	The polymer is not explosive under normal conditions as a dried film.
Stability/reactivity	Not determined	The product containing the polymer is not self-reactive and is stable for storage up to 120°C.
Hydrolysis as function of pH	Not determined	The notified polymer contains ester linkages that could be expected to undergo hydrolysis under extreme pH conditions. However, in the environmental pH range of 4 to 9, significant hydrolysis is unlikely to occur.
Partition coefficient	Not determined	The partition coefficient has not been determined due to its expected low water solubility, and its likely hydrophobic nature, indicative of partitioning into the octanol phase.

Adsorption/desorption	Not determined	The notified polymer is expected to be relatively immobile in soil due to its high molecular weight, monomer composition and expected low water solubility.
Dissociation constant	Not determined	The notified polymer contains no functional groups that may be expected gain or lose a proton.

6. USE, VOLUME AND FORMULATION

Use:

The notified polymer is a primer/undercoat automotive resin. It will be used as a component of a two pack automotive paint.

Manufacture/Import volume:

The estimated import volume for the notified polymer is <100 kg for the first year, increasing to <1 tonne/year over the next 4 years.

Formulation details:

The notified polymer will not be manufactured, formulated or repackaged in Australia. The notified polymer contained in Corlar 5000 934S epoxy primer will be imported in 3.78 L sealed dangerous goods approved can as a component of two pack automotive paint. Part A (epoxy primer) contains <10% notified polymer. Part B (activator) contains a component that crosslinks with ingredients in Part A. The end-use paint contains <5% notified polymer.

7. OCCUPATIONAL EXPOSURE

The paint system will be applied by professional painters using a spray gun. The transfer efficiency for spraying is approximately 50-80%. Prior to spray application, the epoxy primer containing the notified polymer is mixed with activator and other ingredients using a universal measuring cylinder and mixing jar. The paint mixture is poured into a spray gun pot ready for application to the automobile surface. Weighing and mixing are carried in a well-ventilated area. Spray-painting application is conducted within a spray booth.

Exposure route	Exposure details	Controls indicated by notifier
<i>End-use (Paint applicators) 19,000 professional spray painters Australia wide</i>		
<i>Paint make up (0.7 hrs/day, 200 days/year)*</i>		
Dermal, ocular, inhalation	possible skin and eye contamination, and inhalation of solvent aerosol when weighing, activation and thinning of paint, transfer of paint mixture into spray gun pot and cleaning of mixing equipment	<ul style="list-style-type: none"> • Weighing and paint mixing is conducted in a well-ventilated area • Personal Protective Equipment (PPE): neoprene gloves, eye protection, protective clothing and respiratory protection, if mists or vapours are generated
<i>Spray paint application (0.2 hrs/day, 200 days/year)*</i>		
Dermal, ocular and inhalation	skin and eye contamination, and inhalation of spray mist during spray application and cleaning and maintenance of application equipment.	<ul style="list-style-type: none"> • Spray painting conducted within a spray booth and cleaning equipment within a gun wash station, both of which are equipped with an exhaust/filter system • PPE: neoprene gloves, eye protection with face shield, antistatic coveralls, antistatic footwear and supplied air respirator.
<i>Transport and storage</i>		
Dermal	Containers will be sealed and exposure is unlikely except in the event of an accident and clean-up is required	<ul style="list-style-type: none"> • Dangerous goods can is used for transport • PPE: chemical resistant gloves, and eye protection

* Exposure data is derived from the submission for US-EPA Premanufacture Notice for New Chemical Substances

8. PUBLIC EXPOSURE

It is expected that during transport, storage and commercial use, exposure of the general public to the notified polymer will be minimal, except in the event of an accidental spill.

The epoxy primer containing the notified polymer is unlikely to be sold to the public, as it is an automotive primer system requiring the use of commercial automotive spraying facilities. Automobiles spray-painted with primer containing the notified polymer will enter the public

domain, although exposure will be negligible as the primer paint film will be fully cured and over-coated with topcoats.

9. ENVIRONMENTAL EXPOSURE

9.1. Release

The notifier estimates that up to 155 kg per annum of the notified polymer will be disposed of during coating use and up to 25 kg of the notified polymer will be released during the disposal of import containers.

9.2. Fate

The majority of the notified polymer will be crosslinked with other paint components to form a very high molecular weight and stable paint film. It is expected that deterioration of the paint formulation will be negligible over the average life (20 years) of a motor vehicle. Therefore, once incorporated into the paint formulation, the notified polymer is expected to be immobile and pose little risk to the environment.

The wasted notified polymer from spills and equipment cleaning will be collected by licensed waste disposal contractors and treated by a distillation process whereby the solvent is reclaimed and the remaining solid containing the notified polymer will be disposed of in landfill or combined with asphalt and used as a road base tackifier. The notified polymer in overspray will also be disposed of in landfill.

The notified polymer is not expected to be water-soluble and therefore will not be mobile in either the terrestrial or aquatic compartments. As a consequence of its low water solubility, the notified polymer is expected to associate with the soil matrix and sediments. The notified polymer is not expected to cross biological membranes due to its high molecular weight and low water solubility and is therefore not expected to bioaccumulate (Connell, 1990).

10. EVALUATION OF HEALTH EFFECTS DATA

No toxicological data were submitted.

11. EVALUATION OF ENVIRONMENTAL EFFECTS DATA

No ecotoxicological data were provided.

12. ENVIRONMENTAL RISK ASSESSMENT

The majority of the notified polymer will be crosslinked with other paint components to form a very high molecular weight and stable paint film. Therefore, once incorporated into the paint formulation, the notified polymer is expected to be immobile and pose little risk to the environment.

The wasted notified polymer in waste from spills and equipment cleaning will be collected by licensed waste disposal contractors and treated by a distillation process whereby the solvent is reclaimed and the remaining solid containing the notified polymer will be disposed of in landfill or combined with asphalt and used as a road base tackifier. The notified polymer in overspray will also be disposed of in landfill.

The notified polymer is not expected to be water-soluble and therefore will not be mobile in either the terrestrial or aquatic compartments. As a consequence of its low water solubility, the notified polymer is expected to eventually associate with the soil matrix and sediments. Due to its high molecular weight and low water solubility the polymer is not expected to bioaccumulate (Connell, 1990).

The notified polymer is not likely to present a hazard to the environment when it is stored, transported and used in the proposed manner.

13. HEALTH AND SAFETY RISK ASSESSMENT

13.1. Hazard assessment

No toxicological information was provided for the notified polymer. However, the notified polymer has a high molecular weight and is unlikely to penetrate biological membranes. It contains no reactive functional groups and residual monomers are present below the relevant concentration cut offs for classification of the notified polymer as a hazardous substance. The polymer meets the PLC criteria and is unlikely to be a hazardous substance according to the NOHSC *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 1999a).

The notified polymer will be imported as a component of an automotive epoxy primer mixed in a number of solvents. The MSDS for the epoxy primer containing <10% notified polymer states that it may cause irritation to the eyes, skin, nose and throat, and gastrointestinal distress when swallowed. Inhaling the solvent vapours may cause central nervous system depression, headache, dizziness, nausea, staggering gait, confusion and unconsciousness. Prolonged overexposure to solvents has been reported to be associated with permanent brain and central nervous system damage.

The notifier classified the epoxy primer as a non-hazardous substance according to the NOHSC *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 1999a), since the solvents listed on the NOHSC *List of Designated Hazardous Substances* (NOHSC, 1999b) are present at concentrations below the relevant cut off levels for health hazard classification. The appropriate NOHSC exposure standards for the solvents are also listed in the MSDS.

The epoxy primer is classed as a dangerous good, Class 3, flammable liquid, due to the presence of solvents.

13.2. Occupational health and safety

The greatest exposure to the notified polymer is during paint make-up and use of the epoxy primer. Paint make-up should take place in a well-ventilated area.

The final paint mix including the epoxy primer contains a wide variety of solvent and other ingredients, which are likely to introduce human health hazards. The spraying procedure also produces a dense aerosol which could adversely affect human health even in the absence of additional hazardous components. It is also probable that professionals involved in the spray painting industry will use a number of different paint formulations.

The epoxy primer and the final paint mix containing the notified polymer are flammable due to their solvent content. Precautions must be taken to avoid sources of ignition, e.g. use of earthing leads. Operators should wear antistatic overalls and footwear.

For these reasons, the notified polymer must be assessed for the contribution it makes to the hazards associated with spray application of the paint. The spray application requires the use of stringent engineering controls, such as a correctly constructed and maintained spray booth, and of a high level of personal protective equipment, such as impermeable overalls and gloves and a full-face shield and respirator. The use of the paint containing the notified polymer should be in accordance with the NOHSC *National Guidance Material for Spray Painting* (NOHSC, 1999c). The level of protection from exposure afforded by the standard protective measures will provide adequate protection from the notified polymer, which is likely to be less intrinsically toxic than most of the solvents and pigments in the epoxy primer. The low toxicological impact and the control measures in place render the health risk from the notified polymer for the workers as low.

Similar considerations apply in the cleaning of spray equipment and disposal of the polymer. The precautions used for the additional materials should be adequate for protection from the notified polymer. In addition, much of the polymer will be crosslinked and hardened, and therefore immobile, by the time of disposal.

Once the applied final paint mix has hardened, the polymer will not be separately available for exposure or absorption.

There is no occupational exposure expected for transport and storage workers except in case of an accident. The health risk for these workers is expected to be negligible under normal conditions.

Conclusion

The notified polymer itself is of low hazard to human health and safety. Apart from the controls already in place to prevent exposure to other paint components and to the notified polymer in particulate form during spraying, no additional controls are required.

There are NOHSC exposure standards for the solvents identified as ingredients in the imported epoxy primer containing the notified polymer (NOHSC, 1995). The employer is responsible for ensuring that these exposure standards, and exposure standards pertaining to other final paint mix additives, are not exceeded in the workplace.

13.3. Public health

The epoxy primer containing the notified polymer will be used by professional commercial spray-painters consequently, public exposure is likely to be negligible, except in the event of an accidental spill during transport. Automobiles painted with the epoxy primer system will be heat cured, such that the polymer will react with other components in the paint formulation to form an inert, very high molecular weight paint film. This coating will be over-coated with top coats, which will themselves undergo a similar curing process. Therefore, the risk to the public from exposure to the notified polymer through all phases of its life cycle is considered to be low.

14. MSDS AND LABEL ASSESSMENT

14.1. MSDS

The MSDS of the epoxy primer 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* (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 epoxy primer containing the notified polymer 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

Regulatory controls

- The epoxy primer containing the notified polymer should be classified as follows under the ADG Code:
 - Class 3 (Flammable Liquid) and packaging group II
- Suppliers should label the epoxy primer containing the notified polymer as a Class [3] dangerous good with the signal word [Flammable].

Control Measures

Occupational Health and Safety

- Employers should implement the following engineering controls to minimise occupational exposure to the notified polymer in spray paint products:
 - Exhaust ventilation during paint make-up and cleaning of equipment

- Automated spray painting
- Enclosed spray painting booth with exhaust or filter system.
- Employers should implement the following safe work practices to minimise occupational exposure during handling of the notified polymer in spray paint products:
 - Use of the paint containing the notified polymer should be in accordance with the NOHSC *National Guidance Material for Spray Painting*
 - Employers should ensure that NOHSC exposure standards for all of the components of the final paint mix are not exceeded in the workplace
- Employers should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified polymer in spray paint products:
 - Chemical resistant gloves
 - Overalls or antistatic overalls during spray painting
 - Footwear or antistatic footwear during spray painting
 - Eye protection or full-face shield during spray painting
 - Air purifying respirator during spray painting

Guidance in selection of personal protective equipment can be obtained from Australian, Australian/New Zealand or other approved standards.

- 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.

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.

16. REFERENCES

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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