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**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION
AND ASSESSMENT SCHEME**

FULL PUBLIC REPORT

POLYESTER

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

For the purposes of subsection 78(1) of the Act, copies of this full public report may be inspected by the public at the Library, Worksafe Australia, 92-94 Parramatta Road, Camperdown NSW 2050, between the hours of 10.00 a.m. and 12.00 noon and 2.00 p.m. and 4.00 p.m. each week day except on public holidays.

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Director
Chemicals Notification and Assessment

FULL PUBLIC REPORT**POLYESTER****1. APPLICANT**

Dupont Australia of 49-59 Newton Road Wetherill Park NSW 2164 has submitted a limited notification statement with their application for an assessment certificate for Polyester.

2. IDENTITY OF THE CHEMICAL

POLYESTER is not considered to be hazardous based on the nature of the chemical and the data provided. Therefore the chemical identity, composition, spectral data and density have been exempted from publication in the Full Public Report and the Summary Report.

Other name: Polyester

Method of detection and determination:

The notified polymer is separated by gel permeation chromatography and identified by Infrared spectroscopy.

3. PHYSICAL AND CHEMICAL PROPERTIES

The notified polymer is manufactured as an 80% solution in butyl acetate. All properties listed below are those for solution in butyl acetate unless otherwise specified.

| | |
|--|--|
| Appearance at 20°C and 101.3 kPa: | clear viscous liquid with a solvent odour |
| Boiling Point: | 125°C |
| Water solubility: | < 1 ppm (estimated) |
| Hydrolysis as a function of pH: | > 9, carboxyl group of the polymer will be ionised. Hydrolysis of polymer backbone is negligible under normal conditions |
| Vapour pressure: | 15 mm mercury at 25°C |
| Partition coefficient: | not applicable |
| Adsorption/desorption: | not applicable (resin immiscible) |
| Decomposition Temperature: | not determined |

| | |
|----------------------------------|---|
| Dissociation constant: | not determined |
| Flash point: | 23°C |
| Autoignition temperature: | 370°C |
| Explosive limits: | lower 1.2 vol % upper 7.5 vol % |
| Flammability limits: | highly flammable, the notified polymer is combustible |
| Pyrolysis products: | carbon monoxide and smoke |
| Combustion products: | not determined |
| Particle size: | not applicable |
| Reactivity/Stability: | does not decompose under room conditions |

4. PURITY OF THE CHEMICAL

| | |
|--|-------|
| Degree of purity: | > 98% |
| Toxic impurities (> 0.1% by weight): | none |
| Non-hazardous impurities (> 1% by weight): | none |

5. INDUSTRIAL USE

The notified polymer will be a component of a paint formulation, sold as a part of a paint system for use by professional spray painters. The principal use will be in the automotive refinish industry.

6. OCCUPATIONAL EXPOSURE

The notified polymer as a component of a paint formulation, will be imported at a rate of 500 kg per year in pint (0.45 L) and quart (0.95 L) and gallon (3.78 L) tins for direct sale through distributor outlets. Approximately 4000 professional spray shops will be using the paint containing the notified polymer without reformulation. Depending on the type of application, paint may be mixed manually with other ingredients, in well ventilated areas of spray shops. Typically, industrial applications will involve the use of spray coaters in an enclosed ventilated booth with a filtered exhaust system. There will be approximately 8000 professional spray painters, exposed to the notified polymer at the rate of 2 per spray shop.

7. PUBLIC EXPOSURE

The notifier has advised that appropriate work practices will be followed, in accordance with the Worksafe Code of Practice for Spray Painting, and the general public will not be exposed to the notified polymer during the painting procedure. The public come into contact with the hardened, cured film of paint on the surface of

automobiles, and minimal exposure may occur if the paint film is accidentally removed from the surface of the automobile. In such instances the polymer will be immobilised in the hardened paint, and should pose negligible hazard to the public. The polymer will have very low mobility due to its relatively high molecular weight its immiscibility with water, and its relatively inert properties.

Minor public exposure may result from disposal of unused resin, or accidental spillage of the notified polymer during transport and storage.

8 ENVIRONMENTAL EXPOSURE

Release

Products containing the polymer are regulated as dangerous goods. They are to be stored and transported in accordance with the applicable Commonwealth, State or Territory regulations. Any spills should be cleaned up according to the MSDS sheets.

The finished product will principally be used in the automotive refinish industry. It is applied to vehicles by spray guns within approved spray booths. Overspray may constitute 20-50% of total paint sprayed. Most of the overspray is either trapped in air filters or in a water trap. The air filters, containing the collected dry overspray, when due for replacement are disposed of by a waste disposal contractor according to statutory requirements. The water traps use a chemical coagulating agent to precipitate the overspray which is collected in a sump. The sludge from the sump is periodically removed and disposed of by a waste disposal contractor according to statutory requirements. As a result of the use of coagulating agents and the low solubility in water, the concentration of polymer in the waste water is expected to be very low.

Unused/leftover paint after mixing with thinners, hardeners if not used when mixed will be disposed of to a waste drum. This drum is then sent to a waste disposal company for solvent recovery. The solidified residue obtained is then disposed to landfill according to statutory guidelines.

Fate

The fate of the polymer is either to be bound to a vehicle or disposed of by landfill/incineration. In its final form the polymer will be a part of a cross-linked hardened polymer film. Any fragments or chips of the cured paint that occur (due to stone chips, accidents, etc.) would be diffusely dispersed in the environment. Being inert they would be of little concern and form part of the sediments.

Articles coated with the polymer would be eventually disposed of to landfill or recycled by metal smelting. The insoluble nature of the cured polymer will ensure any hydrolysis or breakdown to occur at an extremely low rate.

Contaminated packaging is disposed of as special waste in compliance with local and national regulations. Fully drained containers that are drop- and scrape- free can be treated as industrial waste and can possibly be recycled.

9. EVALUATION OF TOXICOLOGICAL DATA

No toxicology data were submitted for the notified polymer. This is acceptable under the *Industrial Chemicals (Notification and Assessment) Act 1989* (the Act), for polymers with a number-average molecular weight (NAMW) > 1000.

10. ASSESSMENT OF ENVIRONMENTAL EFFECTS

The notifier has not presented any ecotoxicity results for the polymer. Ecotoxicity tests are not required for a polymer with NAMW > 1000 under the Act.

The polymer is not expected to show ecotoxicity effects as it should not cross membranes and is of low concern (1).

11. ASSESSMENT OF ENVIRONMENTAL HAZARD

The environmental hazard from the polymer, when cured, is rated as negligible.

The paint containing the polymer will be formulated for use as part of a paint system used by professional spray painters only. It is claimed by the company that the overspray may constitute 20-50% of total paint sprayed (an efficiency of 50-80%). Therefore of the 500 kg of polymer imported per year (estimated), approximately 100-250 kg will be lost as overspray (250 kg representing the worst case). This overspray is expected to be collected in either air filters or in water traps. As there are a large number of different users (approximately 4000 professional spray shops in Australia - with the company having less than 10% of the market), it is not possible to quantify the amount of polymer trapped in each of these systems. However, almost all the overspray is expected to be collected for disposal.

As the paint waste trapped in the air filters is expected to dry out and cure before disposal, the hazard from this material is expected to be negligible when it is landfilled or incinerated. Any spray droplets not trapped by the air filter will dry out and polymerise to an inert particle. The sludge from the water trap sump is periodically removed and disposed of by a waste disposal company for treatment. The waste water from the water trap is expected to be discharged to the sewer, where it will be diluted by several orders of magnitude and/or partition to the sludge and trapped in the solids at the sewage treatment works. The solids are disposed of by landfill or incineration.

Incineration of the polymer will generate oxides of carbon as well as water. The environmental hazard can be rated as negligible. As the polymer is expected to be insoluble in water, the polymer waste consigned to landfill is unlikely to leach and will stay in the landfill. The polymer could hydrolyse but this process would be extremely slowly due to the low solubility in water. The environmental hazard from the disposal of paint waste containing the polymer is rated as low.

Instructions in the MSDS are adequate to limit the environmental exposure from spills, etc. and therefore the environmental hazard from possible accidental spills should be low.

The overall environmental hazard from the use of the polymer is rated as low.

12. ASSESSMENT OF PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY EFFECTS

As the notified chemical is a polymer of high NAMW (> 1000), it is not expected to be able to cross biological membranes. As a result adverse health effects would not be expected to result from exposure to the polymer. However, the MSDS states the product containing the polymer is a severe skin and eye irritant as well as a systemic toxicant, target organs being kidney, liver and central nervous system. These health effects can be attributed to the hazardous ingredients contained in the product formulation rather than the notified polymer ingredient.

The product containing the notified polymer is highly flammable, and should not be stored or used with other flammable or combustible substances.

Exposure of workers to the polymer during paint application is expected to be low as a result of engineering controls. Therefore, exposure to the notified polymer will be limited only to spills and splashing, during mixing with ingredients prior to spray painting.

The low expected intrinsic toxicity of the polymer and low exposure suggests that the occupational health risk is minimal. However, the MSDS for the product, carries exposure standards (2) for number of ingredients (n-butyl acetate, 1-methoxy-2-propyl acetate, methyl isobutyl ketone and xylene), which are toxic through skin, eye and inhalation routes. Therefore, eye and skin contact, as well as inhalation of the product should be avoided.

The notified polymer will be incorporated into automotive refinish paint coats and used in spray booths, and will not be available to the general public. The public will come into contact with the paint on the surface of automobile. The polymer which has a NAMW > 1000, will be immobilised in the cured, hardened paint film and as such would pose a negligible public risk. The potential for minor public exposure exists during transport and disposal of the polymer formulation if accidentally spilt. This will be minimised by following the recommended practice during storage and transportation in the MSDS.

12. RECOMMENDATIONS

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

- . if engineering controls and work practices are insufficient to reduce exposure to the notified polymer to a safe level, then personal protective devices which conform to and are used in accordance with Australian Standards (AS) for eye protection (AS 1336, AS 1337) (3,4), impermeable gloves (AS 2161) (5), industrial clothing (AS 2919) (6) and footwear (AS 2210) (7) should be worn;
- . good work practices should be implemented to avoid spillages and splashing;
- . good housekeeping and maintenance should be practised. Spillages should be cleaned up promptly with absorbents which should then be put into containers for disposal in accordance with Local or State government regulations;
- . good personal hygiene should be observed; and
- . a copy of the MSDS should be easily accessible to employees.

13. MATERIAL SAFETY DATA SHEET

The attached MSDS for the product AF101 Super Productive 2K Binder containing the notified polymer was provided in a suitable format.

This MSDS was provided by Du Pont (Australia) Ltd as part of their notification statement. The accuracy of this information remains the responsibility of Du Pont (Australia) Ltd.

14. REQUIREMENTS FOR SECONDARY NOTIFICATION

Under the *Industrial Chemicals (Notification and Assessment) Act 1989*, secondary notification of Polyester shall be required if any of the circumstances stipulated under subsection 64(2) of the Act arise.

15. REFERENCES

1. J. V. Nabholz, P. Miller and M. Zeeman, "Environmental Risk Assessment of New Chemicals Under the Toxic Substances Control Act TSCA Section Five", in *Environmental Toxicology and Risk Assessment*, W. G. Landis, J. S. Hughes and M. A. Lewis (Eds), pp 40-55
2. *Exposure Standards for Atmospheric Contaminants in the Occupational Environment, National Exposure Standards, [NOHSC:1003 (1991)]*, 2nd Edition, October 1991.
3. Standards Australia, 1994, *Australian Standard 1336-1994, Recommended Practices for Eye Protection in the Industrial Environment*, Standards Association of Australia Publ., Sydney, Australia.
4. Standards Australia, 1992, *Australian Standard 1337-1992, Eye Protectors for Industrial Applications*, Standards Association of Australia Publ., Sydney, Australia.
5. Standards Australia, 1978, *Australian Standard 2161-1978, Industrial Safety Gloves and Mittens (excluding Electrical and Medical Gloves)*, Standards Association of Australia Publ., Sydney, Australia.
6. Standards Australia, 1987, *Australian Standard 2919 - 1987 Industrial Clothing*, Standards Association of Australia Publ., Sydney, Australia.
7. Standards Australia, 1994, *Australian Standard 2210 - 1994 Occupational Protective Footwear, Part 1: Guide to Selection, Care and Use. Part 2: Specifications*, Standards Association of Australia Publ., Sydney, Australia.