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**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION
AND ASSESSMENT SCHEME**

FULL PUBLIC REPORT

ZK42-4912

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 Aged Care.

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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**ZK42-4912****1. APPLICANT**

BASF Wattyl Coatings Pty Ltd of 231-233 Newton Road, WETHERILL PARK NSW 2164 (ABN 93 080 438 464) has submitted a notification statement in support of their application for an assessment certificate for the synthetic polymer of low concern (PLC).

2. IDENTITY OF THE CHEMICAL

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

Marketing names: ZK42-4912, Parodur El 91.2 (43.3% polymer in butyl glycol).

Molecular weight (MW):

Number-average MW	Weight-average MW	% MW < 1000	% MW < 500	Method
10254	32079	1.3	0	GPC

3. POLYMER COMPOSITION AND PURITY

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

Purity (%): > 99%

Hazardous impurities (other than residual monomers and reactants): None.

Non-hazardous impurities at 1% by weight or more: None.

Additives/adjuvants: The polymer is marketed in 57.7% butyl glycol.

4. PLC JUSTIFICATION

The notified polymer meets the PLC criteria.

5. PHYSICAL AND CHEMICAL PROPERTIES

Property	Result	Comments
Appearance	Clear liquid at room temperature (polymer solution)	
Density	985 kg/m ³ (polymer solution)	
Water solubility		The notified polymer is stated to be immiscible in water, but is water dispersible. The presence of free carboxylic acid groups will tend to increase solubility.
Autoignition temperature	230°C	
Explosive properties	none	
Stability/reactivity		Avoid contact with oxidisers and acids.
Hydrolysis as function of pH		Not determined. The polymer contains some ester and urethane groups, which may hydrolyse under extreme temperature conditions and in the presence of acid or base catalysts.
Partition coefficient		Not determined. The polymer is expected to favour the octanol phase.
Adsorption/desorption		Not determined. The polymer is expected to partition into the organic phases in soils.
Dissociation constant		The polymer contains about 5% free dissociated carboxylic acid groups. The dissociation constant is expected to be similar to the constituent carboxylic acid monomers.

6. USE, VOLUME AND FORMULATION

Use:

The notified polymer is a component of 36 varieties of car re-finish paint.

Manufacture/Import volume:

The notified polymer will not be manufactured in Australia. BASF Wattyl coatings will import the notified polymer at 15 tonnes/annum for the first five years.

Formulation details:

The notified polymer will only be imported as a component of car re-finish paint. The finished paints will contain, on average, 16% notified polymer. The paint mixtures containing the notified polymer, known as the A 90 line, will be imported in 500 mL tin cans. The paints containing the notified polymer will be applied by spray guns. Prior to spray application the A 90 tinter is added to a paint mix and then reduced with a solvent.

7. OCCUPATIONAL EXPOSURE

Exposure route	Exposure details	Controls indicated by notifier
<i>Manufacture</i>		
The notified polymer is not manufactured in Australia.		
<i>End use</i>		
<i>Spray Booth Operators (1000 workers, 5 hrs/week, 150 applications/year)</i>		
dermal, ocular, inhalation.	The paint is manually decanted into 20L holding tanks and mixed with solvents using a spatula or a slow-speed motorised mixing paddle. The mixture is applied using a HVLP or high pressure spray gun.	Mixing carried out under general ventilation or local exhaust ventilation. Spraying carried out inside a down draft spray booth. Respiratory protection, gloves, safety goggles or face shields and protective clothing.
<i>Transport and storage</i>		
<i>Transport, Dockside and Warehouse workers (<20 workers)</i>		
Dermal, ocular, inhalation	No exposure expected except in the event of an accident.	Not stated
<i>Disposal</i>		
dermal	Notified polymer will be trapped within the paint matrix, therefore there is little potential for exposure.	

8. PUBLIC EXPOSURE

There is a chance of public exposure due to rupture of containers in an accident. Public exposure during importation and transportation should be negligible.

The paint product will be redistributed in original containers. There is no public exposure resulting from processing.

The car paint finishing product will not be available to the public. There is significant public exposure through dermal contact with painted cars, however the notified polymer will be trapped within the matrix of the paint and is not bioavailable.

Industrial users will apply the paint in special booths. Overspray is collected from spray booths using filters and water scrubbers. Waste filters from spray booths and scrubber water are disposed of in accordance with regulations. Public exposure to waste is not expected to occur.

9. ENVIRONMENTAL EXPOSURE

9.1. Release

No release of the notified polymer is expected during shipping and transport. The small size of the containers (500 mL) will limit the size of any spills in the event of a transport accident.

Release of the notified polymer to the environment may occur at motor vehicle workshops during preparation and application of the paint containing the polymer. The notifier estimates a loss of up to 30% of paint containing the notified polymer may be incurred as a result of over-spray during paint application using HVLP spray guns. Slightly higher losses are expected when outdated high-pressure spray guns are used. Engineering controls put in place to capture over-spray typically include spray booth filters, water scrubbers, cloth drop-sheets or newspaper. Any overspray will be collected and either incinerated or sent to landfill.

Assuming an annual import volume of 15 tonnes of polymer, and a 30% loss through over-spray, a total of 4.5 tonnes of polymer, may be generated for disposal each year.

Some losses of the polymer may occur as a result of incidental spills during thinning of the paint containing the polymer with solvent. A small amount of waste may also be generated as a result of residues remaining in empty containers or in spray tanks and equipment. These residues are normally rinsed out with solvent, the solvent allowed to evaporate, and the residues allowed to cure and solidify. The solidified residues are then disposed of in landfill. The notifier estimates that < 1% of paint equating to 24 kg per year of notified polymer will remain in containers after use since the containers are rinsed out with solvent and the rinsate added back to the spray tank.

In summary, approximately 4.5 tonnes of notified polymer wastes could be generated in motor vehicle workshops each year as a result of vehicle spray-painting. It is expected that the paint product will be used in workshops throughout Australia and therefore waste generation and disposal will occur in a diffuse manner.

9.2. Fate

No data were provided on the expected environmental fate of the notified polymer. Any of the paint containing the notified polymer collected as spills, or as over-spray is expected to be incinerated or landfilled by licensed waste disposal contractors. Incineration will destroy the polymer producing water vapour and oxides of carbon and nitrogen. In landfill, mobility is unlikely to occur given the polymer will be disposed of in a cured and solidified form. As such the polymer is not expected to leach into aquatic compartments via the soil environment. The polymer contains some ester and urethane groups, which may hydrolyse under extreme conditions such as elevated temperatures, and in the presence of acid or base catalysts. Nevertheless, under ambient temperatures and in pH conditions found in the environment, no hydrolysis of the notified polymer is anticipated. The polymer is also not expected to readily biodegrade. Instead it will likely undergo slow degradation through both biotic and abiotic processes.

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

Once applied to the panels of motor vehicles the notified polymer will be incorporated into a hard, durable, inert film and would not present a hazard to the environment. The metal panels coated with the polymer 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 destroyed in blast furnaces and converted to water vapour and oxides of carbon and nitrogen.

10. EVALUATION OF HEALTH EFFECTS DATA

No toxicological data were submitted.

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

Chemical	Health hazards	Regulatory controls
Additives/adjuvants		
butyl glycol	R20/21/22 – Harmful by inhalation, in contact with skin and if swallowed. R37 – Irritating to respiratory system.	Exposure standard, TWA 25 ppm, ‘Sk’ notation (NOHSC, 1995); Listed in NOHSC <i>List of Designated Hazardous Substances</i> (1999a)

11. EVALUATION OF ENVIRONMENTAL EFFECTS DATA

No ecotoxicological data were provided.

12. ENVIRONMENTAL RISK ASSESSMENT

Most of the imported volume of polymer, incorporated into automotive re-finish paint, will become inert upon drying. However, up to 4.5 tonnes of the notified polymer may be presented for disposal each year as a result of wastes generated in motor vehicle workshops

during vehicle spray-painting. These wastes are expected to be disposed of in a cured and solidified form.

Due to the nationwide use of the paint products, waste generation and disposal will occur in a diffuse manner. The most likely route of disposal is by incineration or in landfill. Incineration will destroy the polymer producing water vapour and oxides of carbon and nitrogen. In landfill, the solidified paint containing the notified polymer is expected remain immobile and to slowly degrade to gases such as carbon dioxide through the agency of abiotic and bacteriological processes.

Under normal usage, the notified polymer is not expected to enter the aquatic environment or pose any significant hazard to aquatic organisms. In the event of an accidental spill into the water compartment, the polymer's large molecular size will prevent movement across biological membranes and bioaccumulation. As such, the product is not expected to pose a significant risk to the environment.

13. HEALTH AND SAFETY RISK ASSESSMENT

13.1. Hazard assessment

No toxicological information has been submitted for the notified polymer. Therefore, the substance cannot be assessed against the NOHSC *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 1999b). The notified polymer meets the criteria for a Polymer of Low Concern and thus is unlikely to present a health hazard.

The imported product containing the notified polymer is classified as hazardous as a result of the 2-butoxyethanol solvent content (20 – 43%) and is assigned the risk phrases R20/21/22 - Harmful by inhalation, in contact with skin and if swallowed and R37 - Irritating to respiratory system as the 2-butoxyethanol content is above the concentration cut-off of 20% (NOHSC, 1999a). The imported product also contains sec.-butanol which has been assigned risk phrases R36/37 - Irritating to eyes and respiratory system and R67 - Vapours may cause drowsiness and dizziness (CHIP, 1999) and 2,4,7,9-tetramethyl-5-decine-4,7-diol which is assigned the risk phrase R36 - Irritating to eyes according to the MSDS for the imported products. Therefore, the imported products should be considered harmful by the standard routes of absorption, to be irritating to eyes and respiratory system and to liberate vapours which may produce drowsiness and dizziness. Exposure standards for sec.-butanol (100 ppm TWA) and 2-butoxyethanol (25 ppm TWA) have been assigned (NOHSC, 1995).

Some of the imported A 90 products containing the notified polymer are classed as Class 3 dangerous goods (flammable liquid) because of the solvent content.

The MSDS for the A 90 product lists a number of potential health effects when exposed to solvent vapour concentrations in excess of the occupational exposure limit, namely mucous membrane and respiratory system irritation and adverse effects on kidney, liver and central nervous system. Symptoms and signs include headache, dizziness, fatigue, muscular weakness, drowsiness and in extreme cases, loss of consciousness. Skin defatting may also occur on repeated exposure and absorption of 2-butoxyethanol (solvent) through the skin will cause harmful effects on the blood.

13.2. Occupational health and safety

Exposure to the notified polymer during transport and storage is not likely to occur except in the event of accidental spillage. The greatest exposure is in the mixing and spraying of the paints.

The final paint mix and the imported A 90 line containing the notified polymer could contain a variety of additional ingredients that may introduce human health hazards. It is also probable that a number of different paint formulations may be used. Therefore, the notified polymer must be assessed for health hazards associated with the application of the paint.

The use of paint containing the notified polymer should be in accordance with the NOHSC *National Guidance Material for Spray Painting* (NOHSC, 1999c). To minimise exposure, all spray painting procedures should be carried out inside a spray booth, utilising air supplied respirators if necessary. Workers should be wearing recommended protective clothing to minimise dermal exposure. Similar considerations apply in the cleaning of equipment, spills and disposal of the polymer.

There is little potential for exposure once the paint mix has dried since the polymer is trapped within the paint matrix.

There are NOHSC exposure standards for 2-butoxyethanol and sec.-butanol, listed as ingredients in the A 90 tinter. The employer is responsible for ensuring that these exposure standards are not exceeded in the workplace.

The products containing the notified polymer are flammable due to their solvent content. Precautions must be taken to avoid sources of ignition.

The notified polymer itself is of low hazard, and apart from the controls stated above, no additional controls are required.

Conclusion

The notified polymer is of low concern to human health and safety and no specific risk reduction measures are necessary.

13.3. Public health

The notified polymer is a component in car paint finishes which are only available to industrial end users. The paint is applied in enclosed spray booths which filter any overspray from the air. Although significant public exposure to painted cars is expected the notified polymer is trapped within the paint matrix. Therefore the notified polymer is unlikely to pose a significant threat to public health.

14. MSDS AND LABEL ASSESSMENT

14.1. MSDS

The MSDS for the imported 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* (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 imported product containing 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

Control Measures

No specific precautions are required to control exposure to the notified polymer. However, in the interests of good occupational health and safety, the following guidelines and precautions should be observed:

Occupational Health and Safety

- 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;
- 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*, workplace practices and control procedures consistent with State and Territory hazardous substances regulations must be in operation.

15.1 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 Section 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 Section 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

CHIP (1999) Chemicals (Hazard Information and Packaging for Supply) Regulations 1994 (CHIP). Dangerous Substances Directive (67/548/EEC) and the Dangerous Preparations Directive (88/379/EEC).

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.

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

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. Australian Government Publishing Service, Canberra.