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NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME

FULL PUBLIC REPORT

Polymer in Glasurit Multi-Effekt 11-Line

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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Director
Chemicals Notification and Assessment

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Polymer in Glasurit Multi-Effekt 11-Line

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) **Polymer in Glasurit Multi-Effekt 11-Line.**

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.

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

Property	Result	Comments
Appearance	Polymer present in a coloured solution.	
Melting point	Not determined	
Density	1.1 g/cm^3	Polymer solution
Water solubility	Insoluble	See comments below
Particle size	Not applicable	Polymer is present only in solution

Flammability	Lower limit >35g/cm^3.	Polymer solution
	Upper limit not determined.	
Autoignition temperature	> 200°C	Polymer solution
Explosive properties	Not explosive	
Stability/reactivity	Stable	

5.1 Comments on physical and chemical properties

The notifier indicated that the polymer is present in a solvent solution. The structure of the polymer does not indicate any reactive properties. Under the conditions of use the polymer will not undergo photo or thermal degradation.

No water solubility study was performed. However, the notifier indicated that the water solubility of the polymer was effectively nil. The structure indicates that the notified polymer will not be miscible with water.

While the new polymer contains groups which may undergo further reaction the polymer will be securely bound within the lacquer. This will preclude contact between the potentially reactive functionalities and water (as well as other reactants in the environment), and hence the possibility for hydrolysis in the environmental pH region (4<pH<9) would be precluded by very low water solubility.

The solution containing the notified polymer is classified as an Australian Dangerous Good Class 3 (flammable liquid), Packing Group 3.

6. USE, VOLUME AND FORMULATION

Use:

The notified polymer is a component of an automotive refinishing paint.

Manufacture/Import volume:

The notified polymer will be imported at a rate of 2.5 tonnes/year for 5 years.

Formulation details:

The notified polymer will be imported in sets of 10 x 125mL bottles as a 30-60% solvent solution.

7. OCCUPATIONAL EXPOSURE

Exposure route	Exposure details	Controls indicated by notifier
Transport and storage (10 workers, 4-10 deliveries/month)		

Transport from wharf to warehouse		
Dermal, ocular	Exposure resulting from accidental puncture of paint tinter containers (30-60% polymer).	No controls identified by notifier.
Transport from warehouse to customers		
Dermal, ocular,	Exposure resulting from accidental puncture of paint tinter containers (30-60% polymer).	No controls identified by notifier.
End use- spray painting (1000 spray painters, 5 hours/week, 48 weeks/year)		
Weighing of polymer solution for paint preparation		
Dermal, ocular	Exposure following slops and spills during mixing of paint tinter (30-60% polymer) with additional solvent.	Ventilated fume cupboard likely in paint preparation area; personal protective equipment consisting of organic vapour respirator, safety glasses/goggles/face shield, chemical resistant gloves and coveralls.
Spray paint application		
Dermal, ocular, respiratory	Exposure during accidental spillage of paint and inhalation of paint aerosols (<1% polymer).	Laminar flow spray booths incorporating spray filters or water scrubbers; personal protective equipment consisting of organic vapour respirator, safety glasses/goggles/face shield, chemical resistant gloves and coveralls.
Cleanup		
Dermal, ocular, respiratory	Possible spillage during handling; exposure to paint mix and aerosols during spray cleaning (<1% polymer).	General ventilation, safety glasses, gloves and protective coveralls.

8. PUBLIC EXPOSURE

The imported paint product containing the notified polymer will not be sold to the general public. The public will frequently come into contact with the notified polymer after it is incorporated into an inert film on car bodies. However, absorption from the inert polymer matrix is unlikely.

9. ENVIRONMENTAL EXPOSURE

9.1. Release

The new polymer will be exclusively used as a component of automotive repair paint. The polymer has the potential for environmental release during the thinning process for lacquer

preparation and then during application. Such environmental release losses are expected to be minimal since the polymer is non-volatile and overspray would be trapped in the spray booth and soaked up with inert absorbent material.

The notifier estimates a 70% consumption of the final product in its end use pattern and a 30% wastage as a result of the application procedures with the use of HVLP spray guns. Taking into account an import volume of 2.5 tonnes of the new polymer the amount of new polymer that may be released into the environment from this application method is estimated as 750 kg/annum. However, if conventional high pressure spray guns are used, 50-60% wastage would be expected, which would give a potential release volume of the notified polymer of 1.5 tonnes/annum. The notifier has estimated the ratio of operators that would be using HVLP spray guns compared to the conventional guns are 60:40 respectively so the release volume of the polymer from the average application processes would likely be 42% or up to 1.05 tonnes/annum. Most of this would be contained within the filters of the control equipment at the automotive repairer, and would be collected and disposed of appropriately by licensed Trade Waste collectors to landfill. Waste polymer within the paint contained in the water scrubber systems from the automotive repair shops will be collected by licensed contractors and disposed of, possibly to landfill after solids separation or to trade waste sewer after treatment.

The paint residues remaining in the import bottles after 'emptying' are estimated to be <1% (up to 25 kg/annum) and will likely be disposed to landfill with the bottles.

The cleaning of spray and mixing equipment will be done with recycled solvent that will be collected every 3-5 weeks by licensed contractors and treated to remove the solids, which then will be disposed to landfill. The notifier has not provided the volumes for this release but 0.5% (up to 12.5 kg/annum) would be a likely estimate given the reuse of the solvent for periods of up to 5 weeks.

9.2. Fate

Once applied to the metal panels of vehicles, the notified polymer will be incorporated in an inert film and would not present a significant hazard. Any fragments, chips or flakes of the paint will be of little concern as they are expected to be inert. The metal panels coated with the polymer are likely to be either recycled for steel reclamation or be placed into landfill at the end of their useful life. During steel reclamation, the polymer would be destroyed in the blast furnaces and converted to water vapour and oxides of carbon and nitrogen. When deposited into landfill with waste paint, used paint cans or on discarded panels, the organic components of the paint including the new polymer would be inert and immobile, but could be expected to very slowly degrade through biological and abiotic processes.

Minimal release to water is expected during normal use of the polymer. In the event of accidental release of the polymer into waterways, it is expected to settle to the bottom and bind to sediments where it would slowly degrade.

The polymer is not expected to cross biological membranes, due to its high molecular weight and predicted low water solubility, and should not bioaccumulate (Connell, 1990).

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 substances regulations or the ADG Code if volumes or concentrations exceed relevant thresholds.
Hazardous impurities		
None	None	
Additives/adjuvants		
2-butoxyethanol	R20/21/22 - Harmful by inhalation, in contact with skin and if swallowed. R37 - Irritating to respiratory system (NOHSC, 1999a)	Exposure standard 121mg/m^3 TWA, skin notation (NOHSC, 1995)
2-dimethylaminoethanol	R36/37/38 - Irritating to eyes, respiratory system and skin (NOHSC, 1999a)	Hazardous substances regulations
2-methoxymethylethyl acetate	R36 - Irritating to eyes (NOHSC, 1999a)	Hazardous substances regulations
Naphtha/aromatic hydrocarbons	R65 - Harmful: May cause lung damage if swallowed (NOHSC, 1999a).	Hazardous substances regulations

11. EVALUATION OF ENVIRONMENTAL EFFECTS DATA

No ecotoxicological data were submitted.

12. ENVIRONMENTAL HAZARD (RISK) ASSSESSMENT

The majority of the polymer would be encapsulated in an inert film after application. However, up to 43.5% (ie. a maximum of 1.4 tonnes per annum) of the polymer could be released as a consequence of paint preparation and application. This is expected to occur

primarily in automotive repair facilities. The procedures in place at the repair facilities ensure that any released material is properly contained and disposed of, most likely to landfill.

The polymer is unlikely to present a hazard to the environment when it is incorporated into the paint and applied to solid substrates. The physical characteristics of low water solubility and low volatility suggest that the mobility and degradation of the polymer in the environment will be very limited.

The polymer's high molecular weight and predicted low water solubility should prevent bioaccumulation.

The low environmental exposure of the polymer as a result of the proposed use indicates the overall environmental hazard should be low.

13. HEALTH AND SAFETY RISK ASSESSMENT

13.1. Hazard assessment

No toxicological information has been provided for the notified polymer. However, due to its high molecular weight and lack of reactive functional groups, it is unlikely to be a hazardous substance in accordance with 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 represent a health hazard.

The paint tinter containing the notified polymer is classified as a Class 3 dangerous good because of the presence of flammable solvents. It is also a Schedule 5 poison. The Material Safety Data Sheet (MSDS) for the paint tinter lists a number of health effects, namely mucous membrane and respiratory system irritation, headaches, dizziness, fatigue, muscular weakness, drowsiness and, in extreme cases, loss of consciousness. These effects are related to the presence of solvents rather than the notified polymer.

13.2. Occupational health and safety

The paint tinter containing the notified polymer will be imported in bottles 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 product containing the polymer. Therefore, the health risk to workers involved in transport and storage is low.

The paint tinter will be sold to numerous automotive repair customers. Spray painters will mix the tinter with thinning solvents before applying the paint to automotive components. Although the notified polymer is unlikely to be classifiable as a hazardous substance, the paint contains a number of hazardous solvents which may be encountered during paint preparation and cleanup. Also, the spraypainting procedure 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 notified polymer and, more importantly, the paint solvents 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 the notified polymer and, in particular, paint solvents must be controlled during spray applications. Engineering controls consisting of ventilated spray booths and personal protective equipment consisting of supplied air respirator, faceshield, gloves and protective coveralls will be employed. These controls are to conform to the relevant Australian Standards or their recognised equivalent. Thus, 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.

Finally, the paint tinters 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, Polymer in Glasurit Multi-Effekt 11-Line is of low concern to human health and safety and no specific risk reduction measures are necessary.

13.3. Public health

The imported paint product containing 30-60% notified polymer will not be sold to the general public. The public will frequently come into contact with the notified polymer after it is incorporated into an inert film on car bodies from which absorption would be unlikely. Therefore, the risk to public health induced by the notified polymer is considered to be low.

14. MSDS AND LABEL ASSESSMENT

14.1. MSDS

The MSDS of the paint 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 paint 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

To minimise occupational exposure to **Polymer in Glasurit Multi-Effekt 11-Line**, 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;

- 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* (NOHSC, 1999b), workplace practices and control procedures consistent with State and territory hazardous substances regulations must be in operation.

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); or other internationally acceptable standards.

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

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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.

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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.

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