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May 2001

**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION
AND ASSESSMENT SCHEME**

FULL PUBLIC REPORT

HP-19-1751

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Director
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FULL PUBLIC REPORT**HP-19-1751****1. APPLICANT**

PPG Industries Australia Pty Ltd of McNaughton Road, CLAYTON VIC 3168 (ACN 055 500 939) has submitted a notification statement in support of their application for an assessment certificate for the synthetic polymer of low concern (PLC) HP-19-1751.

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.

Marketing names: HP-19-1751, Polyester Resin

3. POLYMER COMPOSITION AND PURITY

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

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

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

Additives/adjuvants:

The notified polymer is not isolated, rather is contained in a 10-30 % aromatic hydrocarbon solvent system.

Chemical name	Synonym	CAS no.	% weight
Aromatic hydrocarbon solvent (not specified)	Polyethyl benzenes	64742-94-5	10-29 %
<i>n</i> -butyl alcohol	<i>n</i> -Butanol	71-36-9	1-9 %
1-methoxy-2-propyl acetate	Propylene glycol monomethyl ether acetate	108-65-6	1-9 %

4. PLC JUSTIFICATION

The notified polymer meets the PLC criteria.

5. PHYSICAL AND CHEMICAL PROPERTIES

The properties reported are for the resin product unless otherwise stated.

Property	Result	Comments
Appearance	Viscous liquid with an aromatic naphtha odour	
Glass transition temperature	7.6 °C	For the polymer
Boiling point	140-177 °C	For the solvents present
Density	1068 kg/m ³	
Water solubility	1.8 %	Due to the solvents present.
Particle size	Not applicable.	The polymer is never isolated from the solvents.
Flash point	43 °C (closed cup)	Due to the solvents present.
Flammability	Lower explosion limit: 1.0	Burning may emit toxic fumes; product may form flammable vapour mixtures with air.
Autoignition temperature	Not available.	
Explosive properties	Not available.	The polymer itself is not expected to be explosive.
Stability/reactivity	Not reactive.	
Hydrolysis as function of pH	Not available.	Hydrolysis of the ester linkages of the polymer is possible but would not be expected under environmental conditions (pH 4-9).

5.1 Comments on physical and chemical properties

The MSDS describes the product containing the polymer as combustible with a flash point of 43 °C.

6. USE, VOLUME AND FORMULATION

Use: The notified polymer is used as a component of a solvent-based basecoat in the industrial container coatings market.

Manufacture/Import volume:

The notified polymer will be imported from the USA. The estimated import volume of the notified polymer will be 10–100 tonnes in the first 4 years increasing to 10–250 tonnes in the fifth year. However, the notifier indicates that they may manufacture the notified polymer at their site in Victoria. In this event, the import volumes described above would not change, but would represent the total introduction (import + local manufacture) of the notified polymer.

Formulation details:

The polymer will be imported (containing > 60 % notified polymer) and after reformulation as a paint (containing < 35 % notified polymer) will be stored in steel drums of 20 or 200 L capacity.

7. OCCUPATIONAL EXPOSURE

Exposure route	Exposure details	Controls indicated by notifier
<i>Manufacture</i>		
Transfer of polymer (> 60 %) solution to drums or storage tanks (3 workers 8 hr/day/20 days/yr)		
dermal and/or eye	Skin contact is possible if drum overfilling or spillages occur. Clean-up and maintenance workers may be exposed to residual polymer solution in plant equipment.	PPE worn includes: coveralls, safety shoes, goggles, gloves and respirator to prevent solvent exposure.
Sampling and lab development (1 and 3 workers; 8 hr/day/20 days/yr)		
dermal	Skin contact (if spillage occurs), and during the handling of small quantities of polymer solution or paint for laboratory analysis	PPE: goggles, coveralls and impervious gloves in well-ventilated area, eg fume cupboard
<i>Formulation (Paint manufacture)</i>		
Paint make-up (3 workers 8 hr/day/30 days/yr each)		
dermal and/or eye	Skin contact from spillages of the paint containing the polymer at 35 % is possible during blending in the high speed mixer.	Resin is weighed under exhaust ventilation and piped to an enclosed mixer. Paint is mixed under exhaust ventilation. Spillage would be contained

in banded areas. PPE worn includes: coveralls, safety shoes, goggles, respirator and impervious gloves. Regular measurement of air-flow systems is conducted.

QC testing (3 workers 8 hr/day/30 days/yr each)

dermal and/or eye	Skin contact from spillages of the paint containing the polymer is possible during removal and testing of laboratory samples	PPE includes coveralls, goggles, respirator and impervious gloves.
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Filling containers (3 workers 8 hr/day/30 days/yr each)

dermal and/or eye	Skin contact from spillages of the paint containing the polymer is possible from drips and spills when filling containers (not automated).	Spillage would be contained in banded areas. PPE worn includes: coveralls, safety shoes, goggles, respirator and impervious gloves.
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End use

Paint application (coil coating process) at up to 7 customer sites (30 workers 4 hr/day/220 days/yr each)

dermal and/or eye	Exposure may occur when handling open containers of paint, containing the polymer at 35 %, activation and thinning of paint, addition to coil coating machinery or spillage. Cleaning and maintenance of application and mixing equipment.	The coil coating process is a well ventilated and automated process with fume extraction in place. The efficiency is stated to be >90 %. Overspray from application is trapped within the equipment. Paint vapour is vented via a stack to the atmosphere. PPE includes goggles, anti-static flame retardant coveralls, anti-static footwear, impervious gloves and eye protection with face shields.
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Transport and storage

If imported, the product containing the notified polymer is contained in Dangerous Goods approved steel drums.

dermal and/or eye	Containers will be sealed and exposure is unlikely except in the event of a spill.	PPE worn includes: coveralls, anti-static footwear, goggles, and gloves.
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Disposal (end-use)

dermal and/or eye	The notified polymer will not be sold to the public. Excess resin is collected, converted to an inert	PPE worn include: coveralls, anti-static footwear, safety shoes, goggles, and gloves.
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waste solid and land-filled (*ca.*
100 kg/yr).

8. PUBLIC EXPOSURE

The notified polymer will not be sold to the public, hence exposure is unlikely, except in the event of an accidental spill. Given its use in industrial settings as a component of coil coatings, the exposure to the public to the notified polymer is considered low.

9. ENVIRONMENTAL EXPOSURE

9.1. Release

The polymer solution is a mixture of the notified polymer HP-19-1751 and aromatic hydrocarbon solvents. Although the solvents are volatile there is expected to be negligible release of the polymer to the atmosphere as it is not volatile.

Some release of the notified polymer is expected to occur during manufacture of the coating. Release may occur during blending, batch adjustment and filtration and filling and a spill would be contained by plant bunding. The notifier estimated that up to 100 kg per annum of the polymer is likely to be released through accidental spills, equipment cleaning and rinsing of import drums.

During the coil coating process, no accidental release of the notified polymer is expected as the process is fully enclosed. Transfer efficiency of the coil coating process is estimated to be at least 90 %. Cleaning of the application and mixing equipment is estimated to generate approximately 10 tonnes of waste coating per annum, equating to *ca.* 6 tonnes of the notified polymer. Polymer residue from empty coating containers is estimated to be 200 kg per annum.

The notifier states that all polymer-generated waste during the formulation and application will be separated out during the distillation process to reclaim solvent from the waste resin and paint. The residue containing the notified polymer will be converted to an inert solid and disposed of to landfill or incinerated, with the release of water vapour and oxides of carbon.

It is assumed that the majority of the notified polymer shares the fate of the coated articles. At the end of their useful lives, they are expected to go to landfill or be recycled, in which case the polymer would be destroyed by the high temperatures in the blast furnaces.

9.2. Fate

The majority of the waste notified polymer will be disposed to landfill in solid form after reclamation of the solvents. The polymer is expected to be immobile in landfill due to its insolubility and is not expected to migrate into the aquatic compartment.

It is difficult to predict the course of degradation of the notified polymer in the environment, in the absence of polymer specific physico-chemical data. It is anticipated that the polymer will slowly degrade via abiotic processes, forming carbon dioxide and water.

Recycling of coated articles will presumably result in the polymer being incinerated and forming water vapour and oxides of carbon.

It is expected that approximately 3.8 tonnes/yr of the notified polymer will eventually be disposed of to landfill. The disposed polymer is likely to be in a solid form as residue from solvent reclamation or as coating on treated articles. In the solid form, mobility and solubility are expected to be minimal within landfill.

The relatively high molecular weight suggests that bioaccumulation is unlikely to occur (Connell, 1990).

10. EVALUATION OF HEALTH EFFECTS DATA

There is no toxicology data available on the notified polymer. The polymer is not isolated from solution.

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

Chemical	Health hazards	Regulatory controls
Constituents Residual monomers and reactants	Unknown; all present at < 0.1	
Hazardous impurities	None stated.	
Additives/adjuvants The notified polymer is contained in a 10-30 % hazardous aromatic hydrocarbon solvent system.	May cause eye and skin irritation, may result in nausea, vomiting and central nervous system depression if swallowed and may cause irritation to the mucous membranes and respiratory tract if inhaled, may cause lung damage if swallowed.	Hazardous Substance R65; Xn \geq 10 % – (NOHSC 1999a). Scheduled Poison S5 (AHMAC, 1999).
<i>n</i> -Butanol		NOHSC Exposure Standard with skin notation (Sk); peak exposure; 50 ppm (NOHSC, 1995).
2-methoxy-1-methylethyl acetate	May cause eye irritation	Hazardous Substance R10, R36; S(2)-25 (NOHSC 1999a).

11. EVALUATION OF ENVIRONMENTAL EFFECTS DATA

No ecotoxicological data were provided.

12. ENVIRONMENTAL RISK ASSESSMENT

An estimated 100 kg per annum of the notified polymer is expected to be released from accidental spills, equipment cleaning and rinsing of import drums during formulation of the coating. The coil coating process is expected to be at least 90 % efficient as it is fully enclosed, therefore all overspray from application is trapped within the equipment. Each year cleaning of the equipment is expected to generate *ca.* 3.5 tonnes of waste notified polymer and 200 kg residue from empty coating containers.

All waste notified polymer will be converted to an inert solid during the solvent distillation process. The solid residue will be disposed of to landfill or incinerated with the release of water vapour and oxides of carbon. In landfill the polymer is expected to be immobile and not migrate to the aquatic compartment. It is anticipated that the polymer will degrade slowly through abiotic processes. The majority of the notified polymer will share the fate of the coated articles at the end of their useful lives. Articles are expected to be landfilled or recycled.

The environmental risk posed by the polymer when subject to normal use and application is considered to be low.

13. HEALTH AND SAFETY RISK ASSESSMENT

13.1. Hazard assessment

No toxicological data has been provided on the notified polymer. Considering the high molecular weight, the notified polymer is unlikely to cross biological membranes. 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, 1999b).

The polymer is not isolated from solution. The MSDS for HP-19-1751, listing > 60 % notified polymer, states that the product may cause eye and skin irritation, may result in nausea, vomiting and central nervous system depression if swallowed and may cause irritation to the mucous membranes and respiratory tract if inhaled.

The polymer is not isolated from solution. The MSDS for HP-19-1751, listing up to 60 % notified polymer, states that the product may cause eye and skin irritation, may result in nausea, vomiting and central nervous system depression if swallowed and may cause irritation to the mucous membranes and respiratory tract if inhaled. Due to the solvents present (10-30 % aromatic hydrocarbon solvent system and 2-methoxy-1-methylethyl acetate), the product is classed as a dangerous good, Class 3, flammable liquid and carries the following risk and safety phrases: Xn (harmful), R65 (may cause lung damage if swallowed), S16 (Keep away from sources of ignition), S23 (do not breath vapour), S24/25 (avoid contact with skin and

eyes) and S62 (if swallowed, do not induce vomiting, seek medical advice immediately and show the container or label). It is a schedule 5 poison (AHMAC, 1999) due to the aromatic hydrocarbon content. *n*-Butanol comes with a NOHSC exposure standard containing a skin notation (NOHSC, 1995).

13.2. Occupational health and safety

There are several stages where handling the notified polymer in solution may result in exposure. In the polymer manufacturing process skin contact may occur when transferring the polymer solution (> 60 % notified chemical) to drums and storage tanks. The paint manufacturing process (details were not provided) is said to be carried out under exhaust ventilation, however skin contact may occur during and addition of the polymer solution to the mixer and paint make-up. To minimise contact and prevent off-site contamination, spillage is contained in bunded areas. Where sampling for laboratory analysis is required, exposure is most likely to be from skin contact with spillages.

Dermal exposure to the notified polymer in the finished paint (35 %) may occur during paint drumming off and handling of the paint prior to the coil coating process.

The notified polymer is of low concern to worker health and safety and no specific additional risk reduction measures are necessary. However, given the hazardous nature of the aromatic hydrocarbon and other solvents contained within the resin solution, exposure will need be controlled by the use of effective air flow monitoring and ventilation systems to maintain exposure to levels below the relevant national occupational exposure standard. Further, personnel will need to wear the appropriate personal protective equipment (PPE). Suitable PPE includes respirators/face masks, goggles, anti-static flame retardant coveralls, anti-static footwear, impervious gloves and eye protection with face shields to prevent eye contact. After coil coating, the notified polymer is fixed to the matrix and is not bioavailable.

The risk to workers in handling the notified polymer is low.

13.3. Public health

The notified polymer will not be sold to the public. Exposure of the public to the notified polymer is unlikely, except in the event of an accidental spill. Therefore, the risk to the public from the notified polymer is considered low.

14. MSDS AND LABEL ASSESSMENT

14.1. MSDS

The MSDS of the notified polymer HP-19-1751 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 notified polymer HP-19-1751 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

No specific measures are required for the notified polymer.

To minimise occupational exposure to HP-19-1751 in solvents, the following guidelines and precautions should be observed:

- Protective personal equipment consisting of at least goggles, gloves and overalls should be used during worker exposure to the products containing the notified polymer;
- Employers should ensure that NOHSC exposure standards for all of the components of the polymer solution and its paints are not exceeded in the workplace;
- A copy of the MSDS should be easily accessible to employees.

As the resin products containing HP-19-1751 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 (*National Model Regulations for the Control of Workplace Hazardous Substances*).

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.

The following emergency procedure is recommended:

HP-19-1751 should be disposed of by using absorbent/inert material (sand, soil) to collect material and seal in properly labelled containers for disposal. Local emergency services should be advised if contamination to sewers or waterways occurs.

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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