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NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

FULL PUBLIC REPORT

Polymer in HP-877

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NICNAS

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1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)
PPG Industries Australia Pty Ltd (ABN 82 055 500 939)
McNaughton Road
Clayton Victoria 3168

NOTIFICATION CATEGORY
Standard: Polymer with NAMW <1000 (more than 1 tonne per year).

EXEMPT INFORMATION (SECTION 75 OF THE ACT)
Data items and details claimed exempt from publication are as follows:

Chemical name
Other Name(s)
Molecular formula
Structural formula
Molecular weight
Spectral data
Non-hazardous impurities/residual monomers
Additives/adjuvants
Import volume
Details of use

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)
Variation to the schedule of data requirements is claimed as follows:

Physicochemical properties:
- Melting point/Freezing point
- Boiling point
- Vapour pressure
- Hydrolysis as a function of pH
- Partition coefficient (n-octanol/water)
- Adsorption/Desorption
- Dissociation constant
- Particle size
- Flash point
- Flammability limits

Toxicological properties:
- Acute toxicity, dermal
- Acute toxicity, inhalation
- Irritation, skin
- Irritation, eye
- Skin sensitization
- Repeat dose toxicity
- Genotoxicity, in vivo

Ecotoxicological properties:
- Ready biodegradability
- Bioaccumulation
- Acute/chronic toxicity to aquatic invertebrates
- Algal growth inhibition test
- Inhibition of microbial activity

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)
None

NOTIFICATION IN OTHER COUNTRIES
USA (USEPA Accession # 169632)

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)
HP-877 (solvent solution of the notified polymer)

CAS NUMBER
None allocated

METHODS OF DETECTION AND DETERMINATION

METHOD	Gel Permeation Chromatography (GPC)
Remarks	The molecular weight distribution was determined by GPC.

3. COMPOSITION

DEGREE OF PURITY
> 98%

HAZARDOUS IMPURITIES/RESIDUAL MONOMERS
All residual monomers and hazardous impurities are expected to be present below the relevant cut-offs for classification of the notified polymer as a hazardous substance.

DEGRADATION PRODUCTS
Under extreme heat conditions, eg. fire, the polymer would burn emitting oxides of carbon.

The paint film will very slowly deteriorate under the action of UV from sunlight, but from experience this is insignificant over the average life of a car (20 years).

LOSS OF MONOMERS, OTHER REACTANTS, ADDITIVES, IMPURITIES
There is no loss of monomers, additives or impurities from the notified polymer during the life of the car.

4. INTRODUCTION AND USE INFORMATION

MODE OF INTRODUCTION OF NOTIFIED CHEMICAL (100%) OVER NEXT 5 YEARS
The notified chemical will not be manufactured in Australia, but will be imported as a component in the polymer solution HP-877 at a concentration of 65%.

MAXIMUM INTRODUCTION VOLUME OF NOTIFIED CHEMICAL (100%) OVER NEXT 5 YEARS

Year	*1*	*2*	*3*	*4*	*5*
Tonnes	1-3	3-10	3-10	3-10	3-10

USE
The notified polymer will be formulated in Australia into finished automotive spray paints. It will be spray applied by robots and operators onto car bodies and then baked to form part of the paint finish of the car.

5. PROCESS AND RELEASE INFORMATION

5.1. Distribution, transport and storage

PORT OF ENTRY
The notified chemical will be imported through Melbourne, by wharf.

IDENTITY OF MANUFACTURER/RECIPIENTS
HP-877, the product containing the notified chemical, will be stored and used in production at the PPG paint-manufacturing site in Clayton Victoria. The manufactured product containing the notified chemical will be distributed from the notifier's site to the Toyota Altona, Victoria facility for use.

TRANSPORTATION AND PACKAGING
HP-877 will be imported in 200 L closed head steel drums. The drums of HP-877 will be transported by road from the wharf to the notifier's site. Following paint formulation, 200 L steel drums of the finished product will be transported by road to the Toyota Altona facility.

5.2. Operation description

Paint Formulation

Laboratory Scale

The ingredients required for making the paint, including the notified polymer, are combined in a container in the laboratory under stirring. The paint (containing < 5% notified polymer) is then sprayed onto panels in a spray booth having appropriate extraction. The panels are baked in an oven and the finished paint film is subjected to various tests.

Production Scale

The polymer solution (containing 65% notified polymer) will be pumped from 200 L drums into the closed mixer via a lance the operator places in the drum. The lance is manually transferred from drum to drum until the required amount of polymer has been added to the mixer. Following mixing with other ingredients, approximately 500 mL of the formulated paint (containing < 5% notified polymer) is sampled for testing. When approved the formulated paint is filled through dedicated pipe work and filling equipment into closed head 200 L drums. The filling equipment automatically places a short fill pipe through the bunghole in the top of the drum and fills the drum.

QC Testing

The operator adjusts the paint containing the notified polymer and sprays panels for baking and testing. Several tests such as solids, viscosity and weight per litre are performed on the wet paint.

Paint Application

The 200 L drums of paint (containing <5% notified polymer) are pumped into the circulating mix tank using a dedicated lance, pipe work and pump. Once in the tank, solvent is added to adjust the paint to application viscosity. This paint is pumped around a circulation system from which it is sprayed onto car bodies by robots and operators in a dedicated ventilated spray area. Operators spray the paint onto specific areas of the car that are not painted by the robots. The painted cars travel through an oven where the notified polymer undergoes a heat activated chemical reaction with other polymers in the paint, thereby forming the final paint film on the car.

During production breaks, operators use cloths dampened with solvent to clean residual paint from the spray equipment.

5.3. Occupational exposure

Number and Category of Workers

Category of Worker	*Number*	*Exposure Duration*	*Exposure Frequency*
PPG SITE			
Laboratory			
Paint manufacture and testing	3	8 hours/day	80 days/year
Paint manufacture			
Paint make-up	18	4 hours/day	200 days/year
QC testing	3	4 hours/day	200 days/year
Filling into drums	3	4 hours/day	200 days/year

CUSTOMER SITE			
Paint application			
Adding paint to circulation tank	18	2 hours/day	200 days/year
Hand spray pick-up	30	8 hours/day	200 days/year
Cleaning of spray equipment	18	2 hours/day	200 days/year

EXPOSURE DETAILS

Paint Formulation
Laboratory Scale
There is the potential for exposure to the notified polymer at a concentration of 65% from drips and spills during transfer of the polymer solution to the mixing container. Following formulation of the paint, dermal, ocular and inhalation exposure to the notified polymer at a concentration of < 5% could occur during transfer and spray application of the paint formulation or contact with the wet paint surface. Workers are to be provided with appropriate PPE.

Once the paint surface has been cured the polymer is bound within an inert matrix and therefore will be unavailable for exposure.

Production Scale
Potential for worker exposure to the polymer at a concentration of 65% comes from skin contact with polymer residues on the exterior of the lance. Following paint formulation, exposure to the notified polymer at a concentration of < 5% would be due to skin contact with residues dripping off the fill pipe, and during the manual cleaning of the pipe. Workers are to be provided with appropriate PPE.

QC Testing
There is potential for dermal exposure to the notified polymer at a concentration of < 5% during sampling and testing of the paint formulation. There is the additional potential for inhalation exposure to paint droplets during spray application. Workers are to be provided with appropriate PPE.

Once the paint surface has been cured the polymer is bound within an inert matrix and therefore will be unavailable for exposure.

Paint Application
During transfer of the paint to the circulating mix tank, potential for worker exposure to the polymer at a concentration of < 5% comes from skin contact with paint residues on the exterior of the lance. Dermal, ocular and inhalation exposure to the notified polymer at a concentration of < 5% could occur during spray application of the paint formulation. Workers wear full protective clothing and vapour masks that filter atomised paint out of the air they breathe.

There is potential for exposure to paint residues containing < 5% notified polymer during cleaning.

Once the paint surface has been cured the polymer is bound within an inert matrix and therefore will be unavailable for exposure.

5.4. Release

RELEASE OF CHEMICAL AT SITE
Since the notified polymer is manufactured overseas there will be no release in Australia due to manufacture. Until it reaches the paint manufacturing site, release to the environment during shipping, transport and warehousing will only occur through accidental spills or leaks of the drums or steel packaged containers.

Paint Formulation
At the paint manufacturing site, the annual release of the notified polymer will be via the following points:

Spills	- less than 1%, up to 100 kg to landfill
Import container residue	- less than 3%, up to 300 kg to waste contractor
Equipment cleaning	- up to 0.5%, up to 50 kg to onsite solvent recovery plant.

During the paint formulation operations, it is anticipated that there will be minimal release of the notified polymer during manual transfer from the storage containers to the mixers and during filling of paint into containers or during blending since it is undertaken in enclosed systems. Spills will be within bunded areas and collected with inert absorbent material (eg sand) and placed in a sealable container ready for disposal. The process equipment, including blending tanks and mixers, will be cleaned with suitable solvent, which is collected and sent to an onsite solvent recovery plant. The solvent recovery process will produce recovered solvent, water/effluent with minor amounts of the notified polymer which is returned to the sludge tank, and sludge/solids (containing the waste notified polymer) which will be collected and disposed of offsite.

RELEASE OF CHEMICAL FROM USE

Annual release of the notified polymer to the environment as a result of its use in the automotive industry will include:

Spills	- less than 1%, up to 100 kg
Container residue	- less than 2%, up to 200 kg
Overspray and Equipment cleaning	- up to 40%, up to 4000 kg

All spills will be contained, collected with inert absorbent material (eg sand) and placed in a sealable container ready for disposal. The paint will be applied within specialised spray booth, generally by robots, therefore transfer efficiency will be quite high (approximately 70%). All overspray will be contained, collected and allowed to harden ready for disposal. Painting equipment will generally be cleaned with solvent. This effluent will be collected, allowed to harden before disposal.

Any paint residue in empty paint containers will be allowed to dry and then disposed of with the container to a licensed drum recycler.

5.5. Disposal

Any spilt material will be disposed of to landfill in sealed labelled containers.

Any solids (containing up to 50 kg of notified polymer) produced during the solvent recovery, at the paint manufacturing site, will be disposed of by incineration in cement kilns. Incineration of the notified polymer will produce water and oxides of carbon.

Import and paint containers will be disposed of via a licensed drum recycler offsite, who will either incinerate any residues present or send them to landfill.

Any resultant overspray and cleaning effluent will be allowed to harden and will then be disposed of to landfill.

It is estimated that annually the proposed use pattern will produce less than 4750 kg of solid wastes containing the notified polymer, which will be collected and sent to landfill or incineration.

5.6. Public exposure

The notified polymer will not be directly available to the public. The notified polymer is used in an automotive paint that is cured prior to reaching the public. Therefore, although the public will come into contact with the exterior of car bodies, the notified polymer will not be available for exposure.

6. PHYSICAL AND CHEMICAL PROPERTIES

The polymer is not isolated from solution and therefore it is not possible to determine physicochemical properties for the notified polymer itself. Limited physicochemical data has been provided for HP-877 that contains approximately 65% notified polymer in various solvents.

Appearance at 20°C and 101.3 kPa	A clear viscous slightly yellow liquid (HP-877)

Boiling Point 160ºC (HP-877)

Remarks This boiling point is considered to be due to the solvent content of the polymer solution. By analogy with other polymers this polymer is not volatile under the normal conditions of use. Data taken from MSDS. Study report not provided.

Density 1180 kg/m^3 at 20ºC (notified polymer, estimated)

Remarks This figure has been calculated from the density of the polymer solution = 1050 kg/m^3 and the density of the solvents in that solution.

Vapour Pressure 2600 kPa (HP-877, temperature not specified)

Remarks This vapour pressure is considered to be due to the solvent content of the polymer solution. The notified polymer is not expected to be volatile.
Data taken from MSDS. Study report not provided.

Water Solubility ≤0.06 g / L

METHOD 50 grams of water were added to 10 grams of polymer solution containing 65% notified polymer. The mixture was shaken vigorously, and the "globules" of resin were allowed to settle for an unspecified time. Aliquots (1 g) of the aqueous layer were transferred to a dish and the solids content determined after drying.
Remarks The solid content of the aqueous layer was below the limit of detection (0.0001g). Based on this study the water solubility is calculated to be <0.06g/L.
TEST FACILITY PPG (2004)

Hydrolysis as a Function of pH Not determined

Remarks The polymer contains ester groups which can be hydrolysed. However, this is not likely to occur in the normal environmental pH range (4-9).

Partition Coefficient (n-octanol/water) Not determined

Remarks Due to its water solubility the partition coefficient is likely to be high.

Adsorption/Desorption Not determined

Remarks Due to its low water solubility and chemical nature, the polymer is not expected to be mobile and will adsorb to, or be associated with, soil and sediments.

Dissociation Constant Not determined

Remarks The notified polymer is not considered to dissociate in water due to its low water solubility, though there may be some residual anionic groups with typical acidity.

Particle Size Not determined

Remarks The notified polymer is not isolated from solution

Flash Point Not determined

Remarks Data provided in the MSDS for the product HP-877 containing the notified polymer indicates a flash point of 43.5ºC (pressure unspecified) and is considered to be due to the solvent content of the polymer solution. Study report not provided.

Flammability Limits Not determined

Remarks The notified polymer is not expected to be flammable.

Autoignition Temperature 450°C (HP-877)

Remarks This autoignition temperature is considered to be due to the solvent content of the polymer solution. The notified polymer is not expected to auto ignite. Data taken from MSDS. Study report not provided.

Explosive Properties Not predicted to be explosive

Remarks From examination of the structure, there are no chemical groups that would infer explosive properties; therefore the result has been predicted negative.

Reactivity

Remarks The notified polymer will thermally degrade at temperatures above 200 ^{0} C although the specific temperature is unknown. HP-877 is incompatible with strong mineral acids, strong alkalis and strong oxidising agents.

7. TOXICOLOGICAL INVESTIGATIONS

A full suite of toxicological data for the notified polymer were not submitted. For the reasons detailed below, it was concluded that HP-877 is of low toxicological concern and only an acute oral toxicity study and bacterial mutation assay were required for this polymer.

A polyester with a molecular weight less than or equal to 1000 is a polymer of low concern under *the Act* if it is made from prescribed reactants. The notified polymer is a polyester oligomer constructed from one prescribed reactant and two reactants that are not prescribed but give rise to a structure that is highly similar to a structure derived from prescribed reactants. The notified polymer does not contain any high or moderate concern reactive functional groups.

An organism must absorb a chemical in order to cause an adverse health effect. The ability of a molecule to pass through biological membranes and therefore be absorbed by organisms generally decreases with increasing molecular weight. It is generally accepted that polymers with MW exceeding 1000 are unlikely to pass through biological membranes (Anliker et al., 1988 and Connell DW, 1989). Whilst the molecular weight is < 1000, the notified polymer is a relatively large molecule and as such absorption through the skin is therefore expected to be low. The oligomer has a tight polydispersity, meaning the size of the majority of species will be above 700 daltons and would find it difficult to cross cellular boundries.

The monomers arising from the hydrolysis of the polymer are not listed in the Hazardous Substances. In addition, limited available toxicological data (RTECS) indicate that the non prescribed monomers arising from the hydrolysis of the polymer are of low toxicity.

Endpoint and Result	*Assessment Conclusion*
Rat, acute oral LD50	low toxicity
acute dermal	not determined
acute inhalation	not determined
skin irritation	not determined
eye irritation	not determined
skin sensitisation	not determined
Rat, repeat dose toxicity	not determined
Genotoxicity – bacterial reverse mutation	non mutagenic
Genotoxicity – in vitro	not determined
Genotoxicity – in vivo	not determined

7.1. Acute toxicity – oral

TEST SUBSTANCE HP-877

METHOD OECD TG 423 Acute Oral Toxicity – Acute Toxic Class Method.
Species/Strain Rat/Sprague Dawley
Vehicle Corn oil
Remarks - Method No significant protocol deviations.

RESULTS

Group	*Number and Sex of Animals*	*Dose mg/kg bw*	*Mortality*
I	3 female	300	0
II	3 female	300	0
III	3 female	2000	0
IV	3 female	2000	0

LD50 >5000 mg/kg bw (test substance), >3250 mg/kg bw/day (notified polymer)
Signs of Toxicity There were no deaths or test substance-related clinical signs or remarkable body weight changes during the study period.
Effects in Organs No abnormalities were found in any of the organs examined.

Remarks - Results	LD50 value for the test substance calculated as outlined in OECD Guideline 423, Annex 2c.
CONCLUSION	The notified polymer is low toxicity via the oral route.
TEST FACILITY	ICP Firefly (2005a)

7.8. Genotoxicity – bacteria

TEST SUBSTANCE	HP-877
METHOD	OECD TG 471 Bacterial Reverse Mutation Test. Plate incorporation procedure
Species/Strain	*S. typhimurium*: TA1535, TA1537, TA98, TA100, TA102
Metabolic Activation System	S9-Mix from Aroclor 1254 induced rat liver.
Concentration Range in Main Test	a) With metabolic activation: 10 - 1000 µg/plate (6.5-650 µg/plate notified polymer) b) Without metabolic activation: 10 - 1000 µg/plate (6.5-650 µg/plate notified polymer)
Vehicle	Dimethylsulphoxide
Remarks - Method	No significant protocol deviations The only positive control used in the main study was 2-aminoanthracene which was used in the presence of activation only. However the reversion properties of the tester strains were verified prior to the study using the spot test method. The preliminary test was conducted using tester strain TA100

RESULTS

Metabolic Activation	*Test Substance Concentration (µg/plate) Resulting in:*			
	*Cytotoxicity in Preliminary Test**	*Cytotoxicity in Main Test***	*Precipitation**	*Genotoxic Effect*
Absent	1000			
Test 1		1000 (TA102)	>1000	negative
Test 2		1000 (TA100, TA102, TA1535, TA1537)	> 1000	negative
Present	1000			
Test 1		1000 (TA98, TA1537)	> 1000	negative
Test 2		1000 (TA100)	> 1000	negative

* dose refers to HP-877 which contains 65% notified polymer.
**cytotoxicity in main study not reported, these values are based on a $\geq$ 50% decrease in the revertant count compared to the negative controls.

Remarks - Results	The test substance did not cause a marked increase in the number of revertants per plate of any of the tester strains either in the presence or absence of activation. Negative controls were within historical limits. Positive controls confirmed the sensitivity of the test system
CONCLUSION	The notified chemical was not mutagenic to bacteria under the conditions of the test.
TEST FACILITY	ICP Firefly (2005b)

8. ENVIRONMENT

8.1. Environmental fate

No environmental fate data were submitted. The notified polymer contains function groups that will be broken down by biological mechanisms but is unlikely to be readily biodegradable.

8.2. Ecotoxicological investigations

8.2.1. Acute toxicity to fish

TEST SUBSTANCE	Notified Polymer
METHOD	OECD TG 203 Fish, Acute Toxicity Test – semi static.
Species	Medaka (*Oryzias latipes*)
Exposure Period	96 hours
Auxiliary Solvent	None
Water Hardness	30-100 mg $CaCO_3$/L
Analytical Monitoring	TOC
Remarks – Method	After a range-finding test, it was determined to use a test solution of 100 mg/L nominal and a control. The water accommodated fraction was used as the test solution. The test solution was prepared by mixing the test substance with the dilution water by sonication for 1 hour and then by magnetic stirrer for 47 hours at 24°C. The test solutions were renewed as a batch every 24 hours. The test vessels were exposed to a photoperiod of 16 hours light and 8 hours dark, and there was no aeration or feeding during the study period. The dissolved oxygen, pH and temperature were monitored daily, along with the observations of the fish. The ranges of the environmental parameters were acceptable; temp 24±1°C, dissolved oxygen >60% and pH 6-8.5.

RESULTS

Concentration mg/L		*Number of Fish*	*Mortality*			
Nominal	*Actual*		*24 h*	*48 h*	*72 h*	*96 h*
0	-	10	0	0	0	0
100	1.14	10	0	0	0	0

LC50	>1.14 mg/L at 96 hours. (LL50 at 96 hours >100 mg/L).
NOEC	1.14 mg/L at 96 hours. (NOEL at 96 hours >100 mg/L)
Remarks – Results	The concentration of the test substance in the test solutions was determined by TOC analysis at the beginning and end of every batch of solution (ie at time 0 (freshly prepared) and 24 (old) of each renewal). At 0 hours the concentration was found to be 1.36 mg/L and at 24 hours it was 0.948 mg/L, thus the time weighted mean measured concentration was 1.14 mg/L. Initially the test solutions were clear however by the end of every 24 hour period the solutions had become white with visible solids (suspended, floating and precipitated). Therefore it was concluded that the decrease in concentration was due to precipitation or uptake by the fish. No abnormal behaviour or observations of the fish were made during the study.

CONCLUSION	Under the conditions of the study, the test substance is not toxic to fish up to its limit of water solubility.
TEST FACILITY	Mitsubishi Chemical Safety Institute Ltd (2005)

9. RISK ASSESSMENT

9.1.1. Environment – exposure assessment

Exposure will only occur due to paint manufacture and use of the notified polymer as it will not be manufactured in Australia. It will be reformulated into paints that will be used by specialist technicians in the automotive industry, ie will not be available for general consumer use. The proposed use pattern and waste management indicate that solid wastes (containing up to 4750 kg annually of the notified polymer) resulting from the paint manufacture including from solvent recovery, and paint use will be collected and sent to landfill or incineration. A small amount of the notified polymer may be present in the final effluent from the solvent recovery, which will be returned to the sludge tank.

The notified polymer will interact with other paint components to form a stable chemical matrix and, once dry, is expected to be immobile and pose little risk to the environment. After the useful life of painted article, the notified polymer will suffer the same fate as the article. If the article is recycled then the notified polymer will be destroyed during the heating process to release water vapour, oxides of carbon and nitrogen.

Within a landfill environment, the notified polymer contained in waste from paint manufacture and paint application is not expected to be mobile and is expected to breakdown at a very slow rate. If released into the aquatic environment, the notified polymer is likely to adsorb to suspended organic material and will degrade due to biotic and abiotic processes over time. The notified polymer is not expected to be released to water therefore, adverse ecotoxicological effects to aquatic organisms are not expected.

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

9.1.2. Environment – effects assessment

Only one ecotoxicological study was provided in the notification dossier indicating no toxicity to fish up to the limit of its water solubility. However, under normal usage, the polymer is not expected to enter the aquatic compartment and pose a threat to aquatic organisms.

Further, following application and curing, the notified polymer will be within an inert matrix and be unavailable to organisms. Due to its large molecular weight, the potential for bioaccumulation is very low.

9.1.3. Environment – risk characterisation

The notified polymer contains functional groups which have the potential to hydrolyse in extreme pH conditions. However, in the environmental pH range 4-9 it is expected that it will be hydrolytically stable. The notified polymer is not expected to be readily biodegradable. Due to its water solubility, it is expected that the notified polymer will partition into the sediment and be immobile in soil and sediments. Over time the polymer will slowly degrade to water, and simple carbon compounds via abiotic and biotic means. During automobile recycling the polymer will be destroyed.

Under normal usage there will be no release into the aquatic environment and therefore will not pose a risk to aquatic organisms.

9.2. Human health

9.2.1. Occupational health and safety – exposure assessment

Paint Formulation

Laboratory Scale

Dermal and possibly ocular exposure to the notified polymer at a concentration of 65% (pre-manufacture) and < 5% (post-manufacture) could occur. However, exposure is expected to be low due to the relatively small amounts involved and the use of PPE. Exposure by inhalation during spray application is not expected as the paint is only sprayed in a properly designed

spraybooth. Once the paint surface has dried, the notified polymer is bound within an inert matrix and as such exposure is expected to be negligible.

Production Scale
There is potential for dermal exposure to the notified polymer at a concentration of 65% and < 5% during transfer and filling and cleaning operations respectively. Exposure will be limited by the use of PPE.

QC Testing
There is potential for dermal exposure to the notified polymer at a concentration of < 5% during sampling and testing of the notified polymer. However, exposure is expected to be low due to the relatively small amounts involved and the use of PPE. Certain quality control tests involve spraying but inhalation exposure is expected to be negligible as the paint is only sprayed in a properly designed spraybooth. Once the paint surface has dried, the notified polymer is bound within an inert matrix and as such exposure is expected to be negligible.

Paint Application
Dermal exposure to the notified polymer at a concentration of < 5% could occur from contact with paint residues during transfer and cleaning operations. However, exposure is expected to be low due to the use of PPE. The majority of the spray application is automatic (by robots) and hence exposure to the notified polymer is not expected. Although there is potential for inhalation exposure where manual spray coating occurs, this is considered to be negligible due to the use of engineering controls (ventilated (downdraft) spray area) and respiratory PPE (vapour masks).

9.2.2. Public health – exposure assessment

Public exposure to the notified polymer is expected to be negligible as the notified polymer will not be directly available to the public and although the public will come into contact with the exterior of car bodies painted with notified polymer, the notified polymer will be bound within an inert matrix and hence unavailable for exposure.

9.2.3. Human health – effects assessment

Based on the molecular weight of the majority of the polymer species, the lack of moderate or high concern reactive functional groups and the similarity in structure to polyesters meeting the definition of a polymer of low concern, the notified polymer is considered to be of low toxicity. This is supported by the results of an acute toxicity study in rats and a bacterial mutation study.

Based on the limited available data, the notified chemical is not classified as a hazardous substance in accordance with the NOHSC *Approved Criteria for Classifying Hazardous Substances* (NOHSC 2004).

Due to its solvent content the polymer solution HP-877 is classified as hazardous with the following Risk Phrases (HSIS, 2005):

R45 Carc Cat 2: May cause cancer
R65 Harmful: May cause lung damage if swallowed.

9.2.4. Occupational health and safety – risk characterisation

The major route of exposure to workers involved in polymer and paint formulation and paint application is expected to be dermal. Dermal exposure may occur during transfer of the notified polymer and formulated paint product, collection of quality control samples, quality control testing, cleaning of the tanks and general maintenance. Dermal exposure is limited by the use of PPE. In addition, the notified polymer is expected to have a low order of toxicity. Therefore, the risk to workers is expected to be low.

Significant inhalation exposure to the notified polymer during spray application of the paint is not expected due to the use of engineering controls (spraybooth/ventilated (downdraft) spray area) and in the case of spray application at the Toyota plant respiratory PPE (vapour masks). As such the risk to workers involved in spray application is expected to be low.

9.2.5. Public health – risk characterisation

Public exposure to the notified polymer is expected to be negligible and therefore the risk to public health is also expected to be negligible.

10. CONCLUSIONS – ASSESSMENT LEVEL OF CONCERN FOR THE ENVIRONMENT AND HUMANS

10.1. Hazard classification

Based on the limited available data the notified polymer is not classified as hazardous under the NOHSC *Approved Criteria for Classifying Hazardous Substances*.

and

As a comparison only, the notified polymer is not classified as hazardous using the Globally Harmonised System for the Classification and Labelling of Chemicals (GHS) (United Nations 2003). This system is not mandated in Australia and carries no legal status but is presented for information purposes.

10.2. Environmental risk assessment

The chemical is not considered to pose a risk to the environment based on its reported use pattern.

10.3. Human health risk assessment

10.3.1. Occupational health and safety

There is Low Concern to occupational health and safety under the conditions of the occupational settings described.

10.3.2. Public health

There is Negligible Concern to public health when used in the proposed manner.

11. MATERIAL SAFETY DATA SHEET

11.1. Material Safety Data Sheet

The MSDS of HP-877 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 a matter of public record. The accuracy of the information on the MSDS remains the responsibility of the applicant.

11.2. Label

The label for HP-877 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.

12. RECOMMENDATIONS

CONTROL MEASURES
Occupational Health and Safety

- Employers should implement the following engineering controls to minimise occupational exposure to the notified polymer in formulated paint products:
  - Spray application should be conducted in a down draft spray booth.

- Employers should implement the following safe work practices to minimise

occupational exposure during handling of the notified polymer as introduced and in formulated paint products:
- Avoid skin and eye contact
- Use of spray paints containing the notified polymer should be accordance with the NOHSC National Guidance Material for Spray Painting (NOHSC, 1999)

- Employers should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified polymer as introduced and in formulated paint products:
  - Impermeable gloves;
  - Overalls;
  - Chemical goggles/face shields for industrial spray painters;
  - Vapour respirators if required.

  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 chemical 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.

Environment

- The following control measures should be implemented by paint formulator to minimise environmental exposure during use of the notified polymer:
  - All process equipment and storage areas should be bunded with process drains going to an on-site effluent treatment plant or collection tank.

Disposal

- The notified polymer should be disposed of to landfill or by incineration, where available.

Emergency procedures

- Spills/release of the notified polymer should be handled by containment and collection by absorbent material, then storage of absorbent material in sealable labelled container ready for disposal to landfill. (if necessary)

12.1. 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(2) of the Act:
  - if any of the circumstances listed in the subsection arise.

The Director will then decide whether secondary notification is required.

No additional secondary notification conditions are stipulated.

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