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**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION
AND ASSESSMENT SCHEME**

FULL PUBLIC REPORT

Polymer in HC-97-5599

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Director
Chemicals Notification and Assessment

FULL PUBLIC REPORT**Polymer in HC-97-5599****1. APPLICANT**

PPG Industries Australia Pty Ltd of Unit 801/20 Gerrale Street CRONULLA NSW 2230 has submitted a limited notification statement in support of their application for an assessment certificate for Polymer in HC-97-5599.

2. IDENTITY OF THE CHEMICAL

Polymer in HC-97-5599 is not considered to be hazardous based on the nature of the chemical and the data provided. Therefore the chemical name, CAS number, molecular and structural formulae, molecular weight, spectral data, details of the polymer composition, exact import volumes and specific use of the chemical have been exempted from publication in the Full Public Report and the Summary Report.

Other names:	none
Trade name:	resin containing the polymer is HC-97-5599
Number-average molecular weight:	> 1000
Weight-average molecular weight:	> 1000
Maximum percentage of low molecular weight species (molecular weight < 1000):	< 10%
(molecular weight < 500):	< 5%
Method of detection and determination:	GPC and infrared (IR) spectroscopy

3. PHYSICAL AND CHEMICAL PROPERTIES

The notified chemical will be imported as part of the resin formulation HC-97-5599 and will never be isolated. The following data refer to the polymer unless otherwise stipulated as the formulation.

Appearance at 20°C and 101.3 kPa:	clear colourless liquid (formulation)
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Boiling Point:	not supplied
Specific Gravity:	1.0
Vapour Pressure:	1.33 kPa, temperature not stated (formulation)
Water Solubility:	insoluble
Partition Co-efficient (n-octanol/water):	not determined
Hydrolysis as a Function of pH:	not determined
Adsorption/Desorption:	expected to bind to organic matter in soils
Dissociation Constant:	not expected to dissociate
Flash Point:	23°C (formulation)
Flammability Limits:	L.E.L.=0.8% volume (formulation)
Autoignition Temperature:	not determined
Explosive Properties:	none expected
Reactivity/Stability:	stable

Comments on Physico-Chemical Properties

The water solubility, hydrolysis, partition co-efficient, adsorption/desorption, and dissociation constant of the polymer were not determined. The water solubility of the polymer is expected to be low because of its high molecular weight and monomer composition. The other properties are difficult to determine for poorly soluble polymers of high molecular weight and complexity. Omission of this data is acceptable as non-ionic polymers with a number average molecular weight (NAMW) > 1000 are of low concern (1).

4. PURITY OF THE CHEMICAL

Degree of purity:	high
Toxic or hazardous impurities:	see residual monomers
Non-hazardous impurities (> 1% by weight):	none

**Maximum content
of residual monomers:** < 1%

All the toxic or hazardous impurities are residual monomers. All except one are classified as irritant. The monomer not classified as irritant is not listed on the *Designated List of Hazardous Substances* (2) and no entries are available for it in Sax and Lewis (3) or on Toxline (4). It is probable that this monomer has irritant properties comparable with similar monomers. The levels of residual monomers in the notified polymer are well below these thresholds requiring hazardous classification and on this basis the polymer would not be classified as hazardous according to the criteria of Worksafe Australia (5). There are atmospheric exposure standards (6) listed for two of the residual monomers that are unlikely to be attained due to the low concentration of these residual monomers.

Additives/Adjuvants: none

The formulation HC-97-5599 is classified as hazardous as it contains 35-40% n-butyl acetate a skin, eye and respiratory irritant. The exposure standard for n-butyl acetate is TWA 713 mg/m³ (6).

5. USE, VOLUME AND FORMULATION

HC-97-5599, the formulation containing the notified polymer, will not be manufactured in Australia. It will be imported at a rate of approximately > 100 kg per year for the first five years. It will be imported in 1 litre and 3.5 litre containers which will be packaged into cartons containing 3 x 1 litre, 6 x 1 litre or 2 x 3.5 litre packs.

HC-97-5599 will be used as a component in an automotive refinish coating. It will be directly applied to small sections of the vehicle (ie. touch up repairs).

6. OCCUPATIONAL EXPOSURE

The notified polymer is imported into Australia as part of a formulation, HC-97-5599, and it is not reformulated or repackaged. It is imported by sea in shipping containers. From the dockside these are transported by road to the notifier's warehouse. The containers of formulation are packed in cardboard boxes, palletised and plastic film wrapped. These pallets are removed from the container and dispatched direct to the notifier's customers, automotive body repair shops. Occupational exposure can occur during transport and warehousing, but this will only occur in the event of an accident. Exposure is likely to be limited due to the size of containers and method of packaging. The formulation is packaged in small volumes and all packs are unlikely to break in the event of an accident. Spillage will therefore be limited.

Occupational exposure will be greatest during application of the formulation containing the notified polymer in motor vehicle body repair shops. The formulation containing the polymer also contains 35-40% of n-butyl acetate and is classified as an irritant. The personal protective equipment used by employees to minimise exposure to the n-butyl acetate, respiratory protection, gloves, overalls and goggles,

will also reduce exposure to the notified polymer. Additionally, spray application of the formulation will usually be undertaken in spray booths with exhaust ventilation; these often incorporate filters. The polymer is effectively bound in the paint film after application to motor vehicles; however, occupational exposure could still occur during refinishing/preparation. Dust containing the notified polymer is generated and inhalatory exposure is possible. The notifier is unable to specify the numbers of employees in automotive body repair shops who may potentially be exposed to the notified polymer as this is in part dependent on market penetration of the product. The number of employees/site will be in the range of 1-4.

7. PUBLIC EXPOSURE

HC-97-5599 will be imported in 1 and 3.5L steel containers and transported by road to the PPG warehousing facility. It will then be distributed by road to automotive repair shops. No public exposure to the notified polymer is expected to occur during its distribution.

At automotive repair shops the product is applied as a spray in booths. Although up to 70% of the notified polymer is expected to be lost in the form of overspray during spraying procedures, local exhaust ventilation will be used to vent emissions, and as such no public exposure is expected to occur. Any waste HC-97-5599 should be disposed of in accordance with Federal, State and Local regulations. Empty steel containers will be recycled or disposed of to landfill. Disposal of any waste notified polymer is not expected to lead to any public exposure.

When cured no leaching of the notified polymer from the sprayed surface is expected to occur. In addition, given the NAMW of the notified polymer, should dermal contact occur, absorption is unlikely.

8. ENVIRONMENTAL EXPOSURE

Release

HC-97-5599 has the potential to enter the environment during transport and handling, application and disposal.

Release to the environment during transport and handling would only occur during the unlikely event of an accident. As the notified chemical is being distributed in very small containers (1 litre and 3.5 litre), large spills in such an accident would be highly unlikely.

The majority of the release of the notified substance will occur during spray painting application. It is estimated that up to 70% of the notified substance may be released in the form of overspray. This overspray will be caught on masking materials such as kraft (strong paper) and newspaper, and in paint filters in the spray booths. Empty paint containers will be either recycled or sent for disposal.

The painted vehicles are cured, fixing the polymer into a paint film. The cured

polymer is expected to share the fate of the metal substrate, and be disposed of with the vehicles.

Fate

Leaching from landfill sites is not expected as HC-97-5599 is a polymer with a predicted low water solubility. Upon drying, the polymer will become tacky and adsorb to soil and sediments. Incineration of the notified substance is expected to produce oxides of carbon and oxygen.

The majority of the notified polymer is not expected to be released to the environment until it has been fully cured into a solid polymer matrix. The resultant matrix structure should limit the hydrolysis or biodegradation of the polymer. Bioaccumulation of the polymer is unlikely due to its high molecular weight (> 1000).

9. EVALUATION OF TOXICOLOGICAL DATA

For a synthetic polymer with NAMW > 1000, toxicology data are not required under the Act. None was provided by the notifier.

10. ASSESSMENT OF ENVIRONMENTAL EFFECTS

No ecotoxicological data were provided, which is acceptable for polymers of NAMW > 1000 according to the Act.

The polymer is not expected to show ecotoxicity effects as it is a non-ionic polymer with a NAMW > 1000, and is of low concern (1).

11. ASSESSMENT OF ENVIRONMENTAL HAZARD

The polymer is unlikely to present a hazard to the environment at any stage of its use or disposal. Of the original quantity of polymer imported it is expected that most will not be released from the processing/application sites until it has been cured either on the car body or on overspray catching material. Leaching of the cured polymer from landfill is not expected due to the chemical and physical bonding which occurs during the surface coating process. Any cured polymer that is released, ie. accidents, when vehicles are repaired etc., will be inert and spread over a wide area.

Any uncured waste containing the polymer generated during formulation/application will be disposed of by landfill or incineration. This uncured polymer is not expected to pose an environmental hazard because on drying will become tacky and adsorb to soil and sediment.

12. ASSESSMENT OF PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY EFFECTS

The notified polymer has a NAMW of > 1000 and is therefore not expected to traverse biological membranes and constitute a toxicological hazard. Although the notified polymer contains low levels of a number of residual monomers (in total < 0.4%) and low levels of low molecular weight species (< 5% with NAMW < 1000), they are unlikely to present a toxicological hazard. No toxicological data on tests involving the notified polymer are available to confirm this. The notified polymer is insoluble in water and has a very low vapour pressure, and is not expected to lose constituents by volatilisation, exudation or leaching.

While public contact with surfaces painted with the notified polymer may occur, the high NAMW of the polymer suggests that should dermal contact occur, absorption is unlikely, and therefore, no public exposure is expected to occur.

Occupational exposure to the notified polymer prior to its end use in motor vehicle body repair shops will be minimal, and will only occur if the tins in which it is imported, stored and transported are ruptured accidentally. The formulation is classified as Class 3 dangerous goods and it is stored and transported in accordance with this classification (7).

Occupational exposure during the end use of the formulation, in motor vehicle repair shops, could be significant. The formulation contains hazardous solvents as such it should be used in vehicle spray booths with exhaust ventilation to minimise exposure. If these precautions are taken then exposure to the notified polymer will also be reduced. The main occupational exposure pathways will be via dermal and ocular contact and through inhalation of paint mist during the spray process. The use of industrial safety equipment including goggles or face shields, clothing, gloves and respiratory protective devices will minimise this exposure.

The high NAMW of the polymer would limit transport across biological membranes and the low level of residual monomers would further limit harmful biological effects. The polymer, on the basis of an assessment of the information provided by the notifier, would not be classified as hazardous, however no toxicological data is available to confirm this. The polymer is not isolated or manufactured in Australia. Only the formulation HC-97-5599 is imported. Due to the solvent type and concentration in the formulation, it is classified as hazardous according to the criteria of Worksafe Australia.

13. RECOMMENDATIONS

To minimise occupational exposure to the Polymer in HC-97-5599 the following guidelines and precautions should be observed. The precautions for the use of the notified polymer should recognise the presence of the carrier solvents in the formulations:

- Local exhaust ventilation should be used during mixing.
- Application should take place in spray booths with appropriate engineering controls to reduce exposure to employees.
- When using the notified chemical (as the imported formulation) the following protective equipment should be worn:
 - impervious gloves conforming to Australian Standards (AS) AS 2161 (8),
 - protective eye goggles conforming to AS 1336 (9), and AS/NZS 1337 (10)
 - protective clothing conforming to AS 3765.2 (11), and
 - protective footwear conforming to AS/NZS 2210 (12).
- If engineering controls are not sufficient to control exposure, the following protective equipment should also be worn:
 - respiratory protection conforming to AS/NZS 1715 (13) and AS/NZS 1716 (14).
- Good personal hygiene practices should be observed.
- A copy of the Material Safety Data Sheet (MSDS) should be easily accessible to employees.

14. MATERIAL SAFETY DATA SHEET

The MSDS for the formulation containing the notified chemical was provided in accordance with the *National Code of Practice for the Preparation of Material Safety Data Sheets* (15).

This MSDS was provided by the applicant as part of the notification statement. It is reproduced here as a matter of public record. The accuracy of this information remains the responsibility of the applicant.

15. REQUIREMENTS FOR SECONDARY NOTIFICATION

Under the Act, secondary notification of the notified chemical shall be required if any of the circumstances stipulated under subsection 64(2) of the Act arise. No other specific conditions are prescribed.

16. REFERENCES

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3. Sax and Lewis 1989, *Dangerous Properties of Hazardous Materials*, Van Nostrand Reinhold, New York
4. Toxline Silver Platter (1995). *Toxline SilverPlatter CD-ROM database, 1994-September 1995*, Silver Platter International N.V.
5. National Occupational Health and Safety Commission 1994, *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008(1994)], Australian Government Publishing Service, Canberra.
6. National Occupational Health and Safety Commission 1995, *Exposure Standards for Atmospheric Contaminants in the Occupational Environment* [NOHSC:3008 (1995), 1003(1995)], Australian Government Publishing Service, Canberra.
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Specific Chemicals; Part 2, Limited Protection Against Specific Chemicals, Standards Australia Publ., Sydney, Australia.

12. Standards Australia, Standards New Zealand 1994. *Australian/ New Zealand Standard 2210 - 1994 Occupational Protective Footwear, Part 1: Guide to Selection, Care and Use. Part 2: Specifications*, Standards Association of Australia Publ., Sydney, Australia, Standards Association of New Zealand Publ. Wellington, New Zealand.
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14. Standards Australia, Standards New Zealand, 1991. *Australian/ New Zealand Standard 1716 - 1991 Respiratory Protective Devices*, Standards Association of Australia Publ., Sydney, Australia, Standards Association of New Zealand Publ., Wellington, New Zealand.
15. National Occupational Health and Safety Commission, 1994. *National Code of Practice for the Preparation of Material Safety Data Sheets*, [NOHSC:2011(1994)], AGPS, Canberra.