

File No: PLC/284

10 September 2002

**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION
AND ASSESSMENT SCHEME**

FULL PUBLIC REPORT

Polymer in ZK56-3452 & ZQ7-56042

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TABLE OF CONTENTS

FULL PUBLIC REPORT	3
1. APPLICANT	3
2. IDENTITY OF THE CHEMICAL.....	3
3. POLYMER COMPOSITION AND PURITY	3
4. PLC JUSTIFICATION.....	3
5. PHYSICAL AND CHEMICAL PROPERTIES.....	3
5.1 Comments on physical and chemical properties	4
6. USE, VOLUME AND FORMULATION.....	5
7. OCCUPATIONAL EXPOSURE	5
8. PUBLIC EXPOSURE	6
9. ENVIRONMENTAL EXPOSURE.....	6
9.1. Release	6
9.2. Fate	7
10. EVALUATION OF HEALTH EFFECTS DATA	7
11. EVALUATION OF ENVIRONMENTAL EFFECTS DATA	7
12. ENVIRONMENTAL RISK ASSESSMENT.....	7
13. HEALTH AND SAFETY RISK ASSESSMENT.....	8
13.1. Hazard assessment.....	8
13.2. Occupational health and safety.....	8
13.3. Public health.....	9
14. MSDS AND LABEL ASSESSMENT	9
14.1. MSDS	9
14.2. Label.....	10
15. RECOMMENDATIONS	10
16. REFERENCES.....	11

FULL PUBLIC REPORT**Polymer in ZK56-3452 & ZQ7-56042****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 ZK56-3452 & ZQ7-56042'.

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: ZK56-3452,
ZQ7-56042,
Glasurit 2K-Commercial Vehicle Topcoat 18-(2) Ral 9006 Weissaluminium (Product Code AE18-9006) (containing ZK56-3452),
Glasurit MS-Clear Mat Elastified (6) 923-57 (Product Code AF23-0057) (containing ZQ7-56042).

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

The polymer exists in a solvent solution, mainly xylene and n-butyl acetate. The properties listed below are for the solvent solution unless otherwise stated.

Property	Result	Comments
Appearance	White aluminium liquid (AE18-9006); Colourless liquid (AF23-0057).	
Melting point	Not determined.	
Density	998 kg/m ³ (AE18-9006); 1 026 kg/m ³ (AF23-0057).	
Water solubility	Immiscible for polymer.	See comments below
Particle size	Not determined.	Not applicable for a liquid.
Flammability	Not determined.	Polymer is combustible. Solvents are flammable.
Autoignition temperature	>200°C	
Explosive properties	Lower explosion limit >35 g/m ³ .	
Stability/reactivity	Stable under conditions of use.	Avoid contact with oxidisers, strong acids and alkalis.
Hydrolysis as function of pH	Not determined	The notified polymer contains ester linkages that are able to hydrolyse but are not expected to do so under environmental conditions (pH 4-9).
Partition coefficient	Not determined	The notified polymer is expected to partition into the octanol phase given its poor water solubility.
Adsorption/desorption	Not determined	The notified polymer is expected to associate with the organic phase of soils and sediments given its poor solubility in water.
Dissociation constant	Not determined	The notified polymer does not contain any functional groups that are likely to dissociate under environmental conditions (pH 4-9).

5.1 Comments on physical and chemical properties

The notifier states that products containing the polymer are immiscible in water and that during manufacture the polymer is carried in a xylene and butyl acetate solvent mixture. Based on the hydrophobicity of the groups grafted on to the acrylic backbone of the polymer, it is likely to be insoluble in water.

6. USE, VOLUME AND FORMULATION

Use:

The notified polymer is a component in car re-finish paints for automotive smash repair workshops.

Manufacture/Import volume:

The notified polymer is not manufactured or reformulated in Australia. BASF Watty Coatings will import up to 6 tonnes of the notified polymer per annum or 18-27 tonnes over the first five years.

Formulation details:

The notified polymer will be imported as a component (30-60%) in car re-finish paints. The paint mixtures containing the notified polymer, known as Glasurit 2K-Commercial Vehicle Topcoat 18-(2) Ral 9006 Weissaluminium (Product Code AE18-9006) (containing ZK56-3452), and Glasurit MS-Clear Mat Elastified (6) 923-57 (Product Code AF23-0057) (containing ZQ7-56042), will be imported in 750 and 3 500 mL tin cans. The paints containing the notified polymer will be applied by spray guns. Prior to spray application these products are added to a hardener and then reduced with a solvent to obtain the desired viscosity.

7. OCCUPATIONAL EXPOSURE

Exposure route	Exposure details	Controls indicated by notifier
<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 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. Spraying carried out inside a down draft spray booth. Respiratory protection, safety goggles or face shields, gloves, 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.	Not stated
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8. PUBLIC EXPOSURE

It is expected that during transport and storage public exposure to the notified polymer will be low. The public will come into contact with car paint finishes containing the notified polymer. However, since the polymer is permanently bound within the paint matrix there is little potential for exposure. The notified polymer will not be sold to the public. In consideration of these, it is concluded that the public exposure to the notified polymer is very low.

9. ENVIRONMENTAL EXPOSURE

9.1. Release

No release of the notified polymer is expected during shipping and transport. The small size of the containers (750 to 3500 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 smash repair 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 sent to landfill.

Assuming an annual import volume of 27 tonnes of polymer, and a 30% loss through over-spray, approximately 2 tonnes of polymer, may be generated for disposal each year.

Some losses of the polymer may occur as a result of incidental spills during mixing of the paint components. A small amount of waste may also be generated as a result of residues remaining in empty containers or in spray tanks and equipment. The empty containers are normally rinsed out with solvent and disposed of in landfill. The notifier estimates that up to 195 kg per year of notified polymer may remain in containers after use.

In summary, up to 2 tonnes of notified polymer wastes could be generated in smash repair workshops each year as a result of spray-painting cars. 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 paint containing the notified polymer collected as spills, or as over-spray will be landfilled by licensed waste disposal contractors. In landfill, the polymer is likely to associate with soils and sediments and remain immobile due to its low solubility in water. The polymer contains some ester groups, which may hydrolyse under extreme conditions such as elevated temperatures, and in the presence of acid or base catalysts. 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 abiotic then biotic processes.

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

Once applied to the cars the notified polymer will be incorporated into a hard, durable, inert film. The car parts coated with the polymer are likely to be either recycled for steel reclamation, in the case of metal panels, or placed into landfill at the end of their useful life. During recycling of metal panels refinished with the panits the polymer would be destroyed in blast furnaces and converted to water vapour and oxides of carbon.

10. EVALUATION OF HEALTH EFFECTS DATA

No toxicological data were provided for assessment.

11. EVALUATION OF ENVIRONMENTAL EFFECTS DATA

No ecotoxicological data were provided for assessment.

12. ENVIRONMENTAL RISK ASSESSMENT

The majority of the imported polymer will be incorporated into automotive re-finish paint, which upon drying, will become inert. Up to 2 tonnes of the notified polymer waste may be generated during car spray-painting each year. These will be disposed of in a cured and solidified form to landfill.

Given 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 landfill. In landfill, the solidified paint containing the notified polymer is expected to remain immobile and to slowly degrade to gases such as carbon dioxide through the agency of abiotic and biotic 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. Overall 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 data were provided for the notified polymer. However, the notified polymer is not expected to cross biological membranes based on its high molecular weight. As the notified polymer meets the criteria for a Polymer of Low Concern, it is unlikely to present a health hazard. Therefore, the notified polymer is unlikely to be a hazardous substance according to the NOHSC *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 1999b).

The imported products containing the notified polymer are classified as hazardous. Several monomers of the notified polymer and ingredients of the commercial products are on the NOHSC *List of Designated Hazardous Substance* (NOHSC, 1999a). NOHSC has established Exposure Standards for styrene, methyl methacrylate, xylene, ethylbenzene and n-butylacetate (NOHSC, 1995). Toxicological information in the MSDS for the products containing the notified polymer indicated that exposure to component solvent vapour concentrations in excess of the stated occupational exposure limit may result in 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. Prolonged or repeated contact with the product may cause removal of natural fat from the skin resulting in non-allergic contact dermatitis and absorption through the skin. The liquid splashed in the eyes may cause irritation and reversible damage. One of the components of the product, butylglycol acetate is readily absorbed through the skin and will cause harmful effects on the blood. Most of the effects identified for the product are expected to result from exposure to solvents, rather than the notified polymer.

The imported products containing the notified polymer are classified as Class 3 dangerous goods (flammable liquid) because of the solvent content.

13.2. Occupational health and safety

There is no occupational exposure expected for transport and storage workers except in case of an accident. The health risk for these workers is expected to be negligible under normal conditions. The greatest exposure is in the mixing and spraying of the paints.

The final paint mix containing the notified polymer could contain a variety of solvent and additional ingredients that may introduce human health hazards. The spraying procedure also produces a dense aerosol, which could adversely affect human health. In addition, it is probable that professionals involved in the spray painting industry will use a number of different paint formulations.

The products and the final paint mix containing the notified polymer are flammable due to their solvent content. Precautions must be taken to avoid sources of ignition, e.g. use of earthing leads. Operators should wear antistatic overalls and footwear.

For these reasons, the notified polymer must be assessed for the contribution it makes to the hazards associated with spray application of the paint. The spray application requires the use of stringent engineering controls, such as a correctly constructed and maintained spray booth, and of a high level of personal protective equipment, such as impermeable overalls and gloves and a full-face shield and respirator. The use of the paint containing the notified polymer should be in accordance with the NOHSC *National Guidance Material for Spray Painting* (NOHSC, 1999c). The level of protection from exposure afforded by the standard protective measures will provide adequate protection from the notified polymer, which is likely to be less intrinsically toxic than most of the solvents and pigments in the painting. The low toxicological impact and the control measures in place render the health risk from the notified polymer for the workers as low.

Similar considerations apply in the cleaning of spray equipment and disposal of the polymer. The precautions used for the additional materials should be adequate for protection from the notified polymer. In addition, much of the polymer will be crosslinked and hardened, and therefore immobile, by the time of disposal.

Once the applied final paint mix has hardened, the polymer will not be separately available for exposure or absorption.

Conclusion

The notified polymer itself is of low risk to occupational health and safety. Apart from the controls already in place to prevent exposure to other paint components and to the notified polymer in particulate form during spraying, no additional controls are required.

13.3. Public health

The paint containing the notified polymer will not be sold directly to the public. The likely exposure of the public would occur in the event of an accident during transportation of the imported products containing the notified polymer. During use, the polymer may be released to the atmosphere in the solvent carrier. However, all spray painting procedures are carried out inside a spray booth. Therefore, release of the notified polymer to the environment is expected to be minimal. Public exposure to car paint finishes will result in minimal exposure as the polymer is bound within the paint matrix. Based on the above assessment, the potential for public exposure to the notified polymer under normal conditions of use is considered to be very low. Therefore, it is considered that the polymer will not pose a significant risk to public health.

14. MSDS AND LABEL ASSESSMENT

14.1. MSDS

The MSDS of the [products containing the polymer](#) provided by the notifier [were](#) in accordance with the NOHSC *National Code of Practice for the Preparation of Material Safety Data Sheets* (NOHSC, 1994a). [They are](#) 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 labels for the **products containing the polymer** provided by the notifier **were** in accordance with the NOHSC *National Code of Practice for the Labelling of Workplace Substances* (NOHSC, 1994b). The accuracy of the information on the labels remains the responsibility of the applicant.

15. RECOMMENDATIONS

No specific control measures are required for the notified polymer. However, in the interest of safe use, the following recommendations are made for products containing the polymer.

Regulatory controls

- The products containing the notified polymer should be classified as follows under the ADG Code:
 - Class 3 (Flammable Liquid) and packaging group II
- Suppliers should label the products containing the notified polymer as a Class [3] dangerous good with the signal word [Flammable].

Control Measures

Occupational Health and Safety

- Employers should implement the following engineering controls to minimise occupational exposure to the notified polymer in spray paint products:
 - Exhaust ventilation during paint make-up and cleaning of equipment
 - Automated spray painting
 - Enclosed spray painting booth with exhaust or filter system.
- Employers should implement the following safe work practices to minimise occupational exposure during handling of the notified polymer in spray paint products:
 - Use of the paint containing the notified polymer should be in accordance with the NOHSC *National Guidance Material for Spray Painting*
 - Employers should ensure that NOHSC exposure standards for all of the components of the final paint mix are not exceeded in the workplace
- Employers should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified polymer in spray paint products:
 - Chemical resistant gloves
 - Overalls or antistatic overalls during spray painting
 - Footwear or antistatic footwear during spray painting

- Eye protection or full-face shield during spray painting
- Air purifying respirator during spray painting

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 polymer 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

Emergency procedures

- In the event of a spill, the notified polymer should be contained, absorbed onto soil, sand or other inert material, and the resulting waste disposed of in landfill or by incineration.

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 Subsection 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 Subsection 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

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.

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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.

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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(1999)]. Australian Government Publishing Service, Canberra.

National Occupational Health and Safety Commission (1999c) National Guidance Material for Spray Painting. Australian Government Publishing Service, Canberra.