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**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME
(NICNAS)**

FULL PUBLIC REPORT

Polymer in EFKA-3500

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Street Address:	334 - 336 Illawarra Road MARRICKVILLE NSW 2204, AUSTRALIA.
Postal Address:	GPO Box 58, SYDNEY NSW 2001, AUSTRALIA.
TEL:	+ 61 2 8577 8800
FAX:	+ 61 2 8577 8888.
Website:	www.nicnas.gov.au

**Director
Chemicals Notification and Assessment**

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FULL PUBLIC REPORT

Polymer in EFKA-3500

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)

Ciba Speciality Chemicals Pty Limited, 235 Settlement Rd, Thomastown, VIC 3074 and Multichem Pty Ltd, Suite 6, 400 High Street, Kew, VIC 3101

NOTIFICATION CATEGORY

Synthetic Polymer of Low Concern

EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication by Ciba Speciality Chemicals Pty Limited:

- Import volumes
- Chemical name
- CAS number
- Molecular and structural formulae
- Molecular weight
- Spectral data
- Monomer composition
- Percentage of notified polymer in final products

Data items and details claimed exempt from publication by Multichem Pty Ltd:

- End use customers

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)

No variation to the schedule of data requirements is claimed.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

None

NOTIFICATION IN OTHER COUNTRIES

Canada: DSL for commercial purposes.

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

EFKA-3500 (product containing 50% notified polymer in mixture of water and polyethyleneglycol monomethylether)

MOLECULAR WEIGHT

Number Average Molecular Weight (Mn) >1000

3. COMPOSITION

PLC CRITERIA JUSTIFICATION

Functional Group	Category	Equivalent Weight (FGEW)
COOH	Low concern	N/A

<i>Criterion</i>	<i>Criterion met</i>
Molecular Weight Requirements	Yes
Functional Group Equivalent Weight (FGEW) Requirements	Yes
Low Charge Density	Yes
Approved Elements Only	Yes
No Substantial Degradability	Yes
Not Water Absorbing	Yes
Low Concentrations of Residual Monomers	Yes
Not a Hazard Substance or Dangerous Good	Yes

The notified polymer meets the PLC criteria.

4. INTRODUCTION AND USE INFORMATION

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

<i>Year</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Tonnes</i>	1-3	1-3	1-3	3-10	3-10

USE

An additive in paint for automotive parts.

5. PROCESS AND RELEASE INFORMATION

5.1. Operation Description

The notified polymer will not be manufactured in Australia, but will be imported as a 50% blend in water and polyethylene glycol monomethylether in 25 kg metal pails and 200 kg steel drums. EFKA-3500 will be transported from the wharf to Multichem Pty Ltd for warehousing before it is sent to paint manufacturers for formulation into paint products. Truck drivers will transport the sealed EKKA-3500 containers by road from the wharf to the Multichem warehouse and then as needed to the customer warehouse. Two incoming goods receiving personnel will unload the containers of EFKA-3500 and store them in designated storage areas. The only chance of exposure for these workers will be in the case of damaged and leaking containers.

The polymer solution will be reformulated into paint products at the paint manufacturing site. Formulation of the notified polymer into paint products will involve transfer to mixing tank by metered dosing and mixing polymer solution and other ingredients in a high speed mixer. This process is carried out in a closed system. Each batch is quality checked and adjustments are made as required. The resultant paint is filtered prior to being dispensed into 1 L, 4 L and 10 L steel paint cans and pails and 200L drums using an automated filling machine. The resultant paint contains up to 5% of the notified polymer. Paint products containing the notified polymer will be warehoused at the notifier's site prior to distribution to customer sites.

At the end users site the paint containing the notified polymer will be used in the automotive industry. At the end-users site the paint will be mixed, stirred and diluted then placed in a spray gun. The object to be primed with the paint will be sprayed then heat cured, resulting in the painted article.

6. EXPOSURE INFORMATION

6.1. Summary of Environmental Exposure

Release of chemical at site:

The notified chemical will not be manufactured in Australia. Local operation will include transport and storage, reformulation, filling and packaging and application by end-users in the automotive industry.

The notified chemical will be transported to Australia by ship in 25 kg metal pails or 200 kg steel drums and will be transported directly to the notifier's site for warehousing before supplying paint manufacturers for reformulation and packaging. The finished paint products will be packaged in 1L, 4L and 10L litre steel paint cans and pails.

Release at Multichem's warehouse to the environment may occur in the unlikely event of an accident during transport or an accidental leak. It is estimated that a maximum of 1% of the notified chemical (<100 kg per 5th year of notified polymer) would be lost during spillage. Spills are contained and soaked up with inert absorbent material (sand, diatomite, acid binders, universal binders or sawdust) and placed in sealable containers and disposed of to landfill.

The empty containers (25 kg and 200 kg) will be rinsed with solvent. The residue and the empty containers will be collected by licensed waste contractors. The containers will be disposed off to landfill. The total residues in the containers are expected to account for <100 kg/year of the notified polymer based on 10000 kg/year imported volume. The table below provides an estimate of the residue of the notified substance in the empty containers.

Import Containers

<i>Proportion of import volume in two containers</i>	<i>Residue of product in container</i>	<i>Residue of notified polymer in container</i>	<i>Volume of residues per year*</i>
70% (25 kg container)	2%	0.25 kg	70 kg
30% (200 kg container)	1%	1 kg	15 kg

* Based on 10000 kg/year import volume

The paint formulation operations will take place at the paint manufacturer's site. It is anticipated that there will be minimal release of the notified polymer during transfer from the storage containers to the high speed mixers and during filling of paint into containers. Blending occurs in fully enclosed automated systems. Blending tanks or mixers are cleaned with out with solvents. The high speed mixers will be cleaned with solvents which will be collected and added to subsequent batches. Any spills incurred in the paint formulation operations will be contained by bunding and disposed of to a liquid waste treatment facility by licensed waste disposal contractors. There will be no release of the notified polymer to sewer.

Release of chemical from use

Release of the notified polymer to the environment as a result of its use in car manufacturing, architectural industries etc is expected to be minimal, unless an accidental spillage occurs.

Accidental spills

If accidental spillage occurs during normal operating procedures, it will be contained and soaked up with inert absorbent material (sand) and placed in a sealable container for disposal. Waste material is disposed of to landfill.

Residues in empty containers

The finished paint products will be packaged in 1L, 4L and 10L steel cans and 200L drums. The steel cans will be disposed of to landfill. The residues in the containers are expected to account for up to 2.5 % of the import volume (100 kg per fifth year of the notified polymer). The table below provides an estimate of the residue of the notified substance in the empty containers and the disposal method in place.

Paint Containers

Type and size of container	Residue in empty container (%)	Percentage polymer (%)	Residue of notified polymer in container (kg)	Residue of notified polymer in container per year (kg)	Disposal method
1L steel can	5	2	0.001	10	Landfill
4L steel can	2	2	0.0016	10	Landfill
10L steel can	1	2	0.002	20	Landfill
200L drums	1	2	0.04	60	Landfill

Overspray

A loss of 30% of the ready-for use material is achieved by the use of HVLP spray guns and slightly higher loss with the more outdated high-pressure guns. The engineering controls for overspray are typically spray booth filters and water scrubbers. The spray booth filters are usually renewed every 2-4 months. The filters are disposed of to landfill.

Based on 30% (worst case) overspray losses during application procedures and an annual import volume of 10000 kg, it is expected that approximately 3000 kg of notified polymer per annum would be lost via overspray.

The small amount of waste generated in the application of the coating will be disposed of to landfill.

Cleaning of equipment

Based on 5% losses from cleaning of spray equipment after application procedures, a level of <5% notified polymer in paint mixtures and an annual import volume of 10000 kg it is expected that approximately 500 kg of notified polymer per annum would be lost via cleaning of equipment.

The equipment is cleaned using water or suitable solvent. The solvents are sent offsite for disposal.

For spray equipment, the resultant water based effluent will be treated prior to release to sewer with the resulting solid residue disposed of to landfill. Water from washing brushes and rollers is likely to be disposed of to the sewer or spilled onto the ground.

6.2. Summary of Occupational Exposure

<i>Category of Worker</i>	<i>Number</i>	<i>Exposure Duration</i>	<i>Exposure Frequency</i>
<i>Transport and Storage</i>			
Transporting from dock to notifier's site for warehousing and reformulation (loading/unloading trucks)	2	2-3 hours/day	10-15 days/year
<i>Paint formulation</i>			
Paint make up	3	8 hours/day	30 days/year
QC testing	3	8 hours/day	30 days/year
Filling into drums	3	8 hours/day	30 days/year
Maintenance workers	2	8 hours/day	30 days/year
<i>End use</i>			
Automotive industry	> 1000	4-6 hours/day	220 days/year

Waterfront, transport and warehouse workers are not expected to be exposed to the notified polymer except in the case of an accident involving spillage of the EFKA-3500 containing the notified polymer at 50%. Spills are cleaned up by absorbing with liquid-binding material (sand, diatomite, acid binders, universal binders or sawdust) and recovered into containers for disposal in accordance with local government regulations.

During paint formulation there may be possible dermal and ocular exposure to workers to drips, spills and splashes during charging of mixer, QC testing samples and during filling of paint cans. To minimise exposure, workers wear coveralls, goggles and impervious gloves. Paint is manufactured in mixers fitted with exhaust ventilation system. During filling of cans possible dermal exposure may result from drips and spills when connecting filling lines. Paints are filled into cans also under exhaust ventilation and workers wear coveralls, goggles and impervious gloves.

Maintenance workers may also encounter dermal exposure during equipment maintenance. To minimise exposure, maintenance workers wear coveralls, goggles and gloves.

Workers exposed to the reformulated product will mostly consist of spray painters applying the special paint coatings to surfaces (e.g. automotive parts). Given that the final concentration of the notified

polymer in paints will be up to 5%, worker exposure is expected to be low. Dermal exposure is possible during preparation of paint. Aerosols may be formed during spray application and therefore inhalation exposure may be possible. To minimise exposure during end use, the paint is diluted and applied in a well ventilated, down draft spray booth with an effective fume extraction system. Workers also wear anti-static flame retardant overalls, anti-static footwear, impervious gloves, eye protection and an air fed breathing mask or respirator if local exhaust ventilation is inadequate.

Worker exposure to the notified polymer in dried paints is likely to be minimal, as the polymer will be encapsulated as part of the cured paint film.

6.3. Summary of Public Exposure

The public will not come into contact with the EFKA-3500, nor will it come into contact with the products containing it. The only scenario where the public would have any direct exposure to the EFKA-3500 would be in the event of a spill from a container that had been imported or if containers of product were to be spilt. Such a spill could only occur during transport from the wharf to the customer site and of finished product from the customer site to the end-user sites. Once the paint containing the notified polymer is applied to automotive parts, the notified polymer is bound in an insoluble polymeric matrix. Therefore the exposure of exposure of the general public to the notified polymer is considered low.

7. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa	Clear yellowish viscous liquid
Melting Point/Glass Transition Temp	Not applicable - liquid
Density	1150 kg/m ³
Water Solubility	The notified polymer is surface active and is likely to form micells in water. Apart from the surfactant properties, water solubility would be relatively high considering the presence of 40% potassium salt.
Dissociation Constant	Not determined. The notified polymer contains a COOH group which is expected to have a pKa value in the range of 3-4.
Particle Size	Not applicable - liquid
Reactivity	Under normal conditions the polymer will not degrade or depolymerise.
Degradation Products	No dangerous degradation products known.

8. HUMAN HEALTH IMPLICATIONS

8.1. Toxicology

No toxicological data were submitted.

8.2. Human Health Hazard Assessment

The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard.

9. ENVIRONMENTAL HAZARDS

9.1. Ecotoxicology

No toxicological data were submitted. The notified polymer meets the criteria for a polymer of low concern and therefore is not expected to be hazardous to aquatic species.

9.2. Environmental Hazard Assessment

The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard.

10. RISK ASSESSMENT

10.1. Environment

EFKA-3500 containing the notified polymer at 50% will be reformulated into paint products for the automotive industry. The formulated paint products contain the notified polymer at <5%. The paint will be packaged into 1L, 4L and 10L steel cans and 200L drums.

The paint products containing the notified polymer will be supplied to licensed professional spray painters. Overspray will be captured and disposed of to landfill as will paint residues in empty cans. Equipment residues will be washed with either water or solvent with the water based effluent from spray equipment being treated on-site with the resultant sludge going to landfill and the effluent released to sewer, and the solvent based effluent being sent for solvent recycling and disposal of solid residues to landfill. Release to the sewer will be more direct from washing of brushes and rollers. In water the extent the notified polymer will partition to sediment is unclear, but in either medium it is likely to degrade slowly. A maximum total of over 3000 kg/annum of the notified polymer will be released to the environment due to application process. The paint film will contain the notified polymer as part of a cross-linked matrix. The final fate of the notified polymer will be the same as the final fate of the vehicle, that is either sent to landfill or to recycling where the polymer will be incinerated.

Once applied to the substrate, notified polymer crosslinks with other paint components to form a high molecular weight film and becomes immobilised. The notified polymer, as part of this surface coating will share the fate of the vehicle panel to which it is applied. When the vehicle panel is recycled, the notified polymer will be destroyed through incineration.

The notified polymer has a NAMW of greater than 1000 and is unlikely to cross biological membranes to cause toxicity or bioaccumulate. However, the notified polymer does contain the perfluoro-2-alkylethanol side chain which is linked through an ester group. The ester group may be cleaved under extreme pH conditions or as a result of the action of bacteria to produce the perfluoro-2-alkyl ethanol. The US EPA have measured the BCF (bioconcentration factor) of 2-perfluoroalkyl (C6-C12) ethanol (CAS 68391-08-2) to be 3092¹. A chemical with a BCF of greater than 250 is considered to have bioaccumulation potential.

While the notified polymer contains a perfluorinated side chain, which has the potential to bioaccumulate, it makes up only a portion of the polymer (<30%). While the side chain remains attached to the polymer, there is little risk of bioaccumulation due to the high molecular weight and limited absorption of the notified polymer into biological systems. Furthermore, the notified polymer is present in the final paint at low concentration of <5% and once the paint has cured, the polymer will be trapped within the paint film.

Attention is starting to focus on the volatile polyfluorinated telomer alcohols, such as those potentially released from the notified polymer, as precursors for the widespread distribution of the persistent perfluoroalkyl carboxylic acids (PFCA) and related compounds in the global environment. The main evidence appears to be that PFCAs are too water soluble and non-volatile to move to the Arctic etc in their own right.

While this remains to be proven, the notified polymer will not be manufactured locally, so release of the perfluoro-2-alkylethanol side chain in this case can only occur through polymer breakdown following its release into the environment. However, at this stage it is not known if these polyfluorinated alcohols are already being used for the local manufacture of related polymers, and the extent any release from breakdown of the notified polymer might contribute to their current total Australian release is unclear.

10.2. Occupational Health and Safety

Waterfront, transport and warehouse workers are not expected to be exposed to the notified polymer except in the case of an accident involving spillage of the EFKA-3500 containing the notified polymer at 50%. Workers involved in the cleaning of spills wear PPE such as gloves, eye goggles and overalls.

¹ Federal Register, Vol 65 (232) December 1, 2002, p 75552

During paint formulation there may be possible dermal and ocular exposure of workers to drips, spills and splashes during charging of mixer, QC testing samples and during filling of paint cans. To minimise exposure, workers wear coveralls, goggles and impervious gloves. Paint is manufactured in mixers fitted with a local exhaust ventilation system. During filling of cans possible dermal exposure may result from drips and spills when connecting filling lines. Paints are filled into cans also under exhaust ventilation and workers wear coveralls, goggles and impervious gloves.

Maintenance workers may also encounter dermal exposure during equipment maintenance. To minimise exposure, maintenance workers wear coveralls, goggles and gloves.

Workers exposed to the reformulated product will mostly consist of spray painters applying the special paint coatings to surfaces (e.g. automotive parts). Given that the final concentration of the notified polymer in paints will be up to 5%, worker exposure is expected to be low. Dermal exposure is possible during preparation of paint. Aerosols may be formed during spray application and therefore inhalation exposure may be possible. To minimise exposure during end use, the paint is diluted and applied in a well ventilated, down draft spray booth with an effective fume extraction system. Workers also wear anti-static flame retardant overalls, anti-static footwear, impervious gloves, eye protection and an air fed breathing mask or respirator if local exhaust ventilation is inadequate.

Worker exposure to the notified polymer in dried paints is likely to be minimal, as the polymer will be encapsulated as part of the cured paint film.

Overall, the risk to workers from the notified polymer will be low.

10.3. Public Health

The notified polymer will not be available to the public. EFKA-3500 containing the notified polymer at up to 5% is intended for use by professionals in the automotive industry. Following application, the notified polymer will become trapped within a film and will not be bioavailable. Therefore, the risk to the public from exposure to the notified polymer is considered to be low.

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

11.1. Environmental Risk Assessment

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

11.2. Human Health Risk Assessment

11.2.1. Occupational health and safety

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

11.2.2. Public health

There is Negligible Concern to public health based on its reported use pattern.

12. MATERIAL SAFETY DATA SHEET

12.1. Material Safety Data Sheet

The notifier has provided MSDS as part of the notification statement. The accuracy of the information on the MSDS remains the responsibility of the applicant.

13. RECOMMENDATIONS

CONTROL MEASURES

Occupational Health and Safety

- No specific engineering controls, work practices or personal protective equipment are required for the safe use of the notified polymer itself, however, these should be selected on the basis of all ingredients in the formulation.
 - 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

Disposal

- Spills/release of the notified polymer should be contained by soaking up with inert absorbent material and dispose of as special waste in compliance with local and State regulations as recommended in the MSDS.
- Use water or suitable solvent in cleaning up.
- Prevent product from entering drains.
- The waste resulting from cleaning the spray equipment (during application) should be washed with solvent and sent to solvent recycling. The resultant dried solid residues should be disposed to landfill.

Storage

- Store in cool dry place in tightly closed receptacles.
- Keep ignition sources away.
- Protect against electrostatic charges.

Emergency procedures

- Spills/release of the notified polymer should be contained by soaking up with inert absorbent material and dispose of as special waste in compliance with local and State regulations as recommended in the MSDS.
- Use detergent in cleaning up.
- Prevent product from entering drains.

13.1. 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 subsection 64(1) of the Act; if
 - the notified polymer is introduced in a chemical form that does not meet the PLC criteria.
 - the use pattern is different from an additive in paint for automotive parts.

The Director will then decide whether secondary notification is required.

No additional secondary notification conditions are stipulated.