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

**FULL PUBLIC REPORT**

**EFKA 3600**

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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:	<a href="http://www.nicnas.gov.au">www.nicnas.gov.au</a>

**Director  
Chemicals Notification and Assessment**

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## **FULL PUBLIC REPORT**

**EFKA-3600**

### **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 identity and composition
- Percentage of notified polymer in products.

#### 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: NSN Schedule VI submitted to Environment Canada in October 2003 (NSN 12863).

### **2. IDENTITY OF CHEMICAL**

#### MARKETING NAME(S)

EFKA-3600

#### 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>	1-10	1-10	1-10	1-10	1-10

##### USE

The notified polymer is an additive in coatings. The coating is applied onto wood boards by curtain coating machines, and the coated wood boards are used for internal wall cladding.

#### 5. PROCESS AND RELEASE INFORMATION

##### 5.1. Operation Description

The notified polymer will be imported in 25 kg and 210 kg containers as 100% active material. It 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 EFKA-3600 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-3600 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 liquid polymer will be reformulated into paint products at the customer's paint manufacturing site. Formulation of the notified polymer into paint products will involve transfer of notified polymer by metered dosing to mixing vessel and mixing the notified polymer and other ingredients in a sealed vessel fitted with a high-speed mixer and local exhaust ventilation system. Each batch is to be quality checked and adjustments made as required. The resultant paint is filtered prior to being dispensed into 200 litre closed head drums under exhaust ventilation for supply to customers. The final concentration of the notified polymer in the final product will be < 0.5%. Paint products containing the notified polymer will be warehoused at the paint manufacturer's site in and distributed to end-users.

At the end users site the paint containing the notified polymer is applied to wood boards by curtain coating. The curtain method involves a continuous film of paint which falls over the board as it passes on the conveyor. The board passes through the curtain of paint and emerges on the other side with their new coating. The curtain is created by pumping the paint through a wide trough which has a narrow opening in the bottom. Excess paint is collected and returned to the paint reservoir. The application is a non contact method and gives a very smooth, even distribution of coating across the whole board.

<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 Multichem for warehousing before supplying to paint manufacturers for 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	1	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 (possibly 1-5 sites)</i>			

## 6. EXPOSURE INFORMATION

### 6.1. Summary of Environmental Exposure

#### Release of chemical at site:

The notified polymer will not be manufactured in Australia. Local operations will include transport and storage, formulation, filling and packaging and application by end-users using a curtain coating method.

The notified polymer will be transported to Australia by ship in 25 kg and 210 kg containers (100% active material) and will be transported directly to Mutichem's site for warehousing before paint formulation. The finished paint products will be drummed into 200L closed head drums.

Release at Multichem's site 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 5<sup>th</sup> 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 a sealable container and disposed of to landfill.

The empty containers (25 kg and 210 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 up to 170 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 imported in these containers</i>	<i>Residue product in container</i>	<i>Residue notified chemical in container</i>	<i>Volume of residues per year*</i>
70% (25 kg container)	2%	0.5 kg	140 kg
30% (210 kg container)	1%	2.1 kg	30 kg

*\*based on 10000 kg/year imported volume*

The paint formulation operations will take place at the paint manufacturer's site (possibly at 1-5 customer sites). It is anticipated that there will be minimal release of the notified polymer during transfer from the storage containers to the high speed mixers which are fitted with exhaust ventilation. Blending occurs in fully enclosed automated systems. 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

If accidental spillage occurs during normal operating procedures at the end-users site, 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.

The finished paints containing the notified polymer at <1% will be sold in 200L closed head drums to wood board painting customers.

The residues in the drums are expected to account for up to 2.5 % of the import volume (250 kg/year). The drums are rinsed with solvents before collected by waste disposal contractors.

The coating is applied to the wood boards at the end-users site using the curtain method and any excess paint is collected and returned to the paint reservoir. The equipment is used continuously, but may be shut down for maintenance from time to time. The equipment is cleaned with a suitable solvent which is collected and sent off site to a liquid waste treatment facility. It is estimated that 1% of the import

volume (<100 kg/year) may be lost from cleaning of equipment.

There will be no release to sewer during end-use the products containing the notified polymer.

## 6.2. Summary of Occupational Exposure

### *Transport and Storage:*

Exposure is unlikely to the polymer during transportation and storage. Exposure may result in case of an accidental spill or leak in the container. No controls are required. Gloves, coveralls and goggles are available if required.

### *Paint formulation:*

Workers may be exposed to polymer via dermal and ocular exposure due to drips, spills and splashes during charging of mixer and blending. Workers will wear coveralls, goggles and impervious gloves. Aerosols may be released during blending, but inhalation exposure is low due to exhaust ventilation system.

### *QC testing:*

Dermal and ocular exposure is possible from drips, spills and splashes during batch adjustment and when taking and testing samples. Workers wear coveralls, goggles and impervious gloves to minimise exposure.

### *Filling into drums:*

Dermal exposure may be possible due to drips and spills when connecting filling lines. The paint is filled into drums under local exhaust ventilation and workers wear overalls, goggles and impervious gloves. Therefore exposure is minimal.

### *Maintenance workers:*

There is possible of skin contact during equipment maintenance. Workers wear coveralls, goggles and gloves.

### *End use:*

Paint will be applied using a curtain coating machine. The risk of worker exposure is very low, as the notified polymer is present at <1% in the finished paint product. The notified polymer is stable under normal working conditions and has a high molecular weight and therefore not volatile and won't be taken up through the skin or by inhalation.

## 6.3. Summary of Public Exposure

The public will not come into contact with the EFKA-3600, 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-3600 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 during transport of finished product from the customer site to the end-user sites. Once the paint containing the notified polymer is applied to the wood boards, the notified polymer is bound in an insoluble polymeric matrix. Therefore the risk of exposure of the public to the notified polymer is considered to be low.

## 7. PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance at 20°C and 101.3 kPa</b>	Clear, yellowish, viscous liquid
<b>Melting Point/Glass Transition Temp</b>	Not applicable - liquid
<b>Density</b>	1020 kg/m <sup>3</sup>
<b>Water Solubility</b>	Not miscible or difficult to mix. The notified polymer is expected to have minimal water solubility based on the monomer composition, in particular the hydrophobic perfluorinated hydrocarbon side chain.
<b>Dissociation Constant</b>	The notified polymer contains a COOH group which is expected to have a pKa value in the range

<b>Particle Size</b>	of 3-4.
<b>Reactivity</b>	Not applicable - liquid
<b>Degradation Products</b>	No dangerous reactions known. No dangerous decomposition 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-3600 will be reformulated into paint products for the wood board industry. The formulated paint products will contain the notified polymer at less than 1%. The paint will be packaged in 200 L closed head drums.

The paint products containing the notified polymer will be supplied to professional curtain coaters. Any waste material will be captured and disposed of to landfill as will paint residues in empty drums. Equipment residues will be washed with solvent and sent for solvent recycling and disposal of solid residues to landfill. There will be no release of the notified polymer to sewer. Thus, aquatic species will not be exposed to the notified polymer.

Once applied to the substrate, the 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, therefore, share the fate of the wooden boards.

The notified polymer has a NAMW of greater than 1000 and it is unlikely to cross biological membranes and cause toxicity or bioaccumulate. However, the notified polymer does contain the perfluoro-2-alkyl ethanol 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 bioconcentration factor (BCF) of 2-perfluoroalkyl (C6-C12) ethanol (CAS 68391-08-2) to be 3092<sup>1</sup>. A chemical with 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 small 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 (<1%) 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

<sup>1</sup> Federal Register, Vol 65 (232) December 1, 2002, p 75552



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 the notified polymer will not be manufactured locally, so release of the perfluoro-2-alkylethanol side chain in this case can only occur through the polymer's 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**

Exposure is unlikely to the polymer during transportation and storage. Exposure may result in case of an accidental spill or leak in the container. No controls are required. Gloves, coveralls and goggles are available if required.

During paint formulation workers may be exposed to polymer at 100% concentration via dermal and ocular exposure due to drips, spills and splashes during charging of the mixer and blending. Workers will wear coveralls, goggles and impervious gloves. Aerosols may be released during blending, but inhalation exposure is low due to an exhaust ventilation system.

During QC testing dermal and ocular exposure is possible from drips, spills and splashes during batch adjustment and when taking and testing samples. Workers wear coveralls, goggles and impervious gloves to minimise exposure.

During filling of drums dermal exposure may be possible due to drips and spills when connecting filling lines. The paint is filled into drums under local exhaust ventilation and workers wear overalls, goggles and impervious gloves. Therefore exposure is minimal.

There is a possibility of skin contact during equipment maintenance. Workers wear coveralls, goggles and gloves.

Paint will be applied using a curtain coating machine. The risk of worker exposure is very low, as the notified polymer is present at <1% in the finished paint product. The notified polymer is stable under normal working conditions and has a high molecular weight and therefore won't be taken up through the skin.

After application and once dried, the paint containing the notified polymer is cured into an inert matrix and is hence unavailable for exposure.

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. Formulated painting products containing the notified polymer at less than 1% is intended for use by professional curtain coaters in the wood board industry only. Following application, the notified polymer will become trapped within a film and will not be bioavailable. Therefore, the risk to public from exposure to the notified polymer is considered 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 the 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

- The waste resulting from cleaning the curtain coating 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 disposed 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 coating onto wood boards by the curtain coating machine.

The Director will then decide whether secondary notification is required.

No additional secondary notification conditions are stipulated.