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

FULL PUBLIC REPORT

Zeffle FPW 2150

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**Director
Chemicals Notification and Assessment**

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FULL PUBLIC REPORT**Zeffle FPW 2150****1. APPLICANT AND NOTIFICATION DETAILS**

APPLICANT

Akzo Nobel Pty Ltd of 51 McIntyre Road, Sunshine, VIC 3020 (ABN 59 000 119 424)

NOTIFICATION CATEGORY

The notified polymer meets the PLC criteria.

EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication: Chemical Name, other names, CAS number, molecular and structural formula, means of identification, molecular weight, charge density, polymer constituents, residual monomers and impurities, identity of reactive functional groups, import volume, site of formulation, purity.

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

None

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

Zeffle FPW 2150

3. COMPOSITION

All compositional information is exempt.

4. INTRODUCTION AND USE INFORMATION

MODE OF INTRODUCTION OF NOTIFIED POLYMER (100%) OVER NEXT 5 YEARS

Imported.

MAXIMUM INTRODUCTION VOLUME OF NOTIFIED POLYMER (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>	10-30	10-30	30-100	30-100	30-100

USE

The notified polymer is intended for use as a resin in powder paint preparations.

5. PROCESS AND RELEASE INFORMATION**5.1. Distribution, Transport and Storage**

IDENTITY OF MANUFACTURER/RECIPIENTS
Akzo Nobel Pty Ltd, Sunshine, VIC

5.2. Operation Description

The notified polymer will be imported in 100 L drums. It will be reformulated into the powder paint at Akzo Nobel, and packaged into 15-20 kg lots contained in a plastic liner bag and insulated cardboard boxing. The final concentration of the notified polymer in powder paint is about 55%. The final product is used as a coating material for exterior architectural applications.

5.3. Occupational exposure

Exposure Details

TRANSPORT AND STORAGE:

The imported polymer is transported by road to the importer. Two fork-lift drivers, 2 customs clearing agents and 1 driver may handle the containers, but are not expected to be exposed to the polymer. The finished powder paint will be transferred to the end-use site by one truck driver.

FORMULATION AND PACKAGING OF PAINT:

Two workers (1 hour/day) will be involved in the charging of the notified polymer into the reaction vessel. The preparation is then extruded and milled to the desired particle size. Two workers (1 hour/day) will be involved in transferring the paint preparation into the packaging. Routes of exposure are anticipated to be dermal and inhalation.

DRUM RECONDITIONING AND WASTE DISPOSAL:

Up to three drum reconditioners will assess and, as appropriate, dispose or recondition drums. Waste material is collected and loaded manually onto a truck and transported to a landfill site.

END USE

The powder coating product containing the notified polymer will be used at seven sites by customers approved by the notifier. The powder paint is applied in accordance with Standards Australia (1990) guidelines

5.4. Release

RELEASE OF CHEMICAL AT SITE

Release of the notified polymer into the environment during transport, storage, preparation and packaging of the final powder coating is not anticipated, except in the event of accidental spills. During the pre-batching, mixing, chipping, and milling stages of the preparation process there will be engineering controls in place to contain and entrap any incidental spills of the notified polymer. No estimates were provided of the amounts of release arising from spills. Container residues are estimated to amount to <0.1% (approximately 100 kg) of the notified polymer.

RELEASE OF CHEMICAL FROM USE

The amount of waste powder generated upon application is dependent on the efficiency of the equipment and the size of the article being coated. The powder paint technology will be marketed to a select number of customers who have powder recovery systems averaging 95% efficiency. The powder recovery system is designed to collect and recycle over-spray for powder re-application. An average of 2-5% powder (maximum 2.75 tonnes notified polymer) loss occurs where there is a recovery system in place. In cases where no recovery system is in place and customers choose to spray, up to 35% of wastes may be generated. The latter scenario is unlikely given the associated cost of the material.

5.5. Disposal

Material not recycled is collected, loaded manually onto trucks and transported to landfill sites. The MSDS recommends disposal in landfill or by incineration, with landfill being the preferred method.

5.6. Public exposure

The notified polymer and the powder paint product are intended for industrial use only. Public exposure could occur in the event of an accidental spill or release. Emergency procedures would minimise contact. Members of the public will contact the surface coated with the notified polymer.

6. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa White granules or powder

Melting Point 89.5-104.5°C

Density 1220 kg/m³

Water Solubility <1 mg/L at 20°C

Remarks A water solubility test was conducted in cold water by adding the notified polymer and stirring for 1 hour. The soluble matter was determined in the supernatant to be 0.04% w/w. The notified polymer is slightly soluble.

Hydrolysis as a Function of pH Not determined

Remarks The notified polymer is not expected to hydrolyse within environmental pH and temperature conditions owing to its low water solubility.

Partition Coefficient (n-octanol/water) Not determined

Remarks Given the low water solubility, the notified polymer is likely to have an affinity for *n*-octanol.

Adsorption/Desorption Not determined

Remarks The notified polymer is expected to be immobile in soils.

Dissociation Constant Not determined

Remarks The notified polymer does not contain any dissociable groups.

Particle Size	>400 µm	82.85%
	400-125 µm	13.25%
	125-75 µm	2.35%
	75-30 µm	1.5%
	30-10 µm	0.25%
	<10 µm	0

The end product powder paint has a mean particle size of 37.74 µm, with ≈10% below 10 µm and ≈100% below 150 µm.

Remarks Information provided by manufacturer.

Flammability Not highly flammable.

Explosive Properties Not explosive.

7. TOXICOLOGICAL INVESTIGATIONS

No toxicological data were submitted.

8. ECOTOXICOLOGICAL INVESTIGATIONS

No ecotoxicological data were submitted.

9. RISK ASSESSMENT

9.1. Environment

9.1.1. Environment – exposure assessment

The notified polymer will be formulated into powder paint. Once the paint is cured, the polymer will be in the form of an inert matrix, so no environmental exposure is anticipated. There is potential for environmental release during application of the powder coating. However, coating operations are expected to take place in spray booths where the generated dust is trapped by controls such as filters and wet scrubbers, which collect the fine powder for recycling or disposal.

All wastes generated are disposed of in landfill through licensed waste contractors. In landfill, the powder containing the polymer is expected to be immobile owing to its low water solubility and is unlikely to leach into the aquatic compartment. The powder may undergo slow abiotic and microbial degradation over time. Biotic and abiotic processes will ultimately breakdown the non-fluorinated part of the notified polymer, while the perfluorinated part is likely to persist owing to the strength of the carbon-fluorine bonds. In cases where wastes are incinerated, this would produce oxides of carbon and potentially hazardous combustion products such as HF, COF₂, and perfluorocarbons, and hence incineration should be carried out only in an approved hazardous waste facility.

The high molecular weight would preclude the notified polymer crossing biological membrane, and hence the polymer is unlikely to bioaccumulate in organisms.

9.1.2. Environment – effects assessment

No ecotoxicological data were provided.

9.1.3. Environment – risk characterisation

The majority of the notified polymer will be incorporated into the paint matrix, which once solidified, is expected to pose a minimum risk to the environment. The main environmental risk would arise from release of wastes generated during applications of the coatings. These wastes will be recycled, incinerated, or disposed of in landfill. Wastes entering landfill are expected to be immobile and not to pose a risk. The combustion products arising from incineration are also unlikely to pose a risk when incineration is carried out in approved incineration facilities.

No information has been provided on the biodegradability or ecotoxicology of the notified polymer. The notified polymer is unlikely to degrade quickly in landfill, but should ultimately breakdown, with the perfluorinated part likely to persist. The fate of any perfluorinated metabolites is unknown. The toxicology of perfluorinated compounds is also poorly understood, however, since no aquatic exposure is anticipated, it is not expected to represent a risk to organisms.

9.2. Human health

9.2.1. Occupational health and safety – exposure assessment

TRANSPORT AND STORAGE:
No exposure is expected.

FORMULATION AND PACKAGING OF PAINT:
Local exhaust ventilation is used in the pre-batching area of the plant, and extraction systems are used in milling process areas. Dust monitoring programs are conducted under the direction of an occupational hygienist. All workers wear appropriate personal protective equipment, including general work wear, facemask, rubber gloves, and safety glasses. In addition, EPA monitoring of dust emissions is carried out.

DRUM RECONDITIONING AND WASTE DISPOSAL:
No exposure is anticipated.

END USE

The standards for the application of powder paint provide for especially constructed booths with extraction ventilation to prevent build up of dust. The guidelines also specify the wearing of a full facepiece respirator or head covering respirator in accordance with AS 1716, and suitable protective clothing to minimise skin contact (Standards Australia, 1990).

9.2.2. Public health – exposure assessment

No exposure is expected.

9.2.3. Human health - effects assessment

Exposure to fluoro polymers can occur from ingestion, skin contact or inhalation. The polymers have not been shown to be irritating to the skin, and no adverse reactions have been observed in animals fed with sintered polymer or exposed to dust from grinding the resin. Although much of the commercial use of tetrafluoroethylene-ethene copolymers have been in melt-processing, no cases of permanent injury have been attributed to fluoro polymer resins, and only limited instances of temporary irritation to the upper respiratory tract have been reported in occupational settings (Kroschwitz, 1994).

Heating of fluoro polymers, however, can produce toxic perfluoroalkene gases, including perfluoroisobutylene (PFIB). PFIB is a colourless gas and a potent irritant of the eyes, skin and mucous membranes. Exposure to PFIB can produce headache, cough, substernal chest pain, dyspnea and fever, followed by pneumonitis and pulmonary oedema within 24 hours. Exposure to decomposition products from heated fluoro polymers without adequate ventilation may result in polymer fume fever, an influenza-like syndrome with symptoms of chills, fever, profuse sweating, cough, dyspnea, flue-like symptoms and chest tightness. The symptoms are self-limiting and last between 24 and 48 hours. The decomposition products of fluoro polymers are temperature dependent, with toxic fluoroalkenes produced at temperatures between 315 and 375°C (Meditext, 2002).

9.2.4. Occupational health and safety – risk characterisation

In the manufacture of the powder paint, the polymer is milled to the required particle size, and no heating of the polymer occurs. Therefore, the production of toxic gases during the manufacture of the powder paint is unlikely to occur. However, as both the polymer and the paint are powders, the recommended exposure standard for dust applies. The provisions of standards for the application of powder paint provide adequate protection from the notified polymer during end use.

9.2.5. Public health – risk characterisation

As there will be no exposure of the public to the notified polymer or products containing the notified polymer the risk to the public from exposure to the notified polymer is considered low.

10. CONCLUSIONS – ASSESSMENT LEVEL OF CONCERN FOR THE ENVIRONMENT AND HUMANS**10.1. Hazard classification**

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

10.2. Environmental risk assessment

The polymer 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.

11. MATERIAL SAFETY DATA SHEET

11.1. Material Safety Data Sheet

The MSDS of 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 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 isolation and engineering controls to minimise occupational exposure to the notified polymer:
 - Adequate ventilation should be provided to maintain the dust level below the NOHSC exposure standard.
- Employers should implement isolation, engineering controls and safe work practices to minimise occupational exposure to the notified polymer in the powder paint products in accordance with AS 3754-1990 *Safe Application of Powder Coating by Electrostatic Spraying*.
- Employers should ensure that personal protective equipment is used by workers to minimise occupational exposure to the notified polymer:
 - Coverall, rubber protective gloves and safety glasses or tight goggles. Respiratory protection should also be provided if dust levels exceed the exposure standard.
- Employers should ensure that personal protective equipment is used by workers to minimise occupational exposure to the notified polymer in the powder paint products in accordance with *Safe Application of Powder Coating by Electrostatic Spraying* and AS 1716 *Respiratory Protection Devices*.

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.

Disposal

- The notified polymer should be disposed of in landfill or by incineration in the presence of flammable material in a permitted hazardous waste facility.

Emergency procedures

- Spills/release of the notified polymer should be collected and placed in suitable containers for disposal.
- The notified polymer should not be allowed to enter drains.

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(1) of the Act; if
 - the notified polymer is introduced in a chemical form that does not meet the PLC criteria.or
- (2) 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.

13. BIBLIOGRAPHY

Kroschwitz JJ, ed. (1994) Kirk-Othmer encyclopedia of chemical technology. New York, NY, John Wiley & Sons

Meditext. *Perfluoroisobutylene*. <http://csi.micromedex.com/DATA/TM/TM1273-0.htm>. Accessed 18/10/02

National Occupational Health and Safety Commission (1994a) National Code of Practice for the Preparation of Material Safety Data Sheets [NOHSC:2011(1994)]. Australian Government Publishing Service, Canberra.

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.

Standards Australia (1990) Safe Application of powder coatings by electrostatic spraying. Sydney.