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

FULL PUBLIC REPORT

Melflux 1641 F, Melflux 1643 F

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**Director
Chemicals Notification and Assessment**

FULL PUBLIC REPORT**Melflux 1641 F, Melflux 1643 F****1. APPLICANT AND NOTIFICATION DETAILS**

APPLICANT(S)

Mefchem Pty Ltd

27 Forest Park Road, Dingley, Victoria 3172

NOTIFICATION CATEGORY

Synthetic Polymer of Low Concern

EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication:

Chemical name

CAS number

Structural formula

Polymer constituents

Residual monomers and impurities

Number Average Molecular Weight

Weight-average Molecular Weight

Weight Percentage of Polymer Species with MW <1000 and <500

Charge density

Reactive functional groups-include FGEW

Import volume

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)

Nil

NOTIFICATION IN OTHER COUNTRIES

Canada 2001 (NSN# 10521), US 2003 (P03-705)

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

Melflux 1641 F and Melflux 1643 F

PLC CRITERIA JUSTIFICATION

<i>Criterion</i>	<i>Criterion met (yes/no/not applicable)</i>
Meets Molecular Weight Requirements	Yes
Meets Functional Group Equivalent Weight (FGEW) Requirements	Yes
Low Charge Density	Yes
Approved Elements Only	Yes
No Substantial Degradability	Yes
Water Absorbing	Yes
Low Concentrations of Residual Monomers	Yes
Hazardous Substance	Yes

The notified polymer meets the PLC criteria.

3. COMPOSITION

HAZARDOUS IMPURITIES/RESIDUAL MONOMERS

None are present at levels, which would lead to the PLC being classified as hazardous substance.

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>	<50	<50	<200	<200	<200

USE

Polymeric admixture for cements.

5. PROCESS AND RELEASE INFORMATION

5.1. Operation Description

The notified polymer will be imported in ready to use form as a free flowing powder packed in 15 kg paper bags with polyethylene coating. The bagged notified chemical is delivered to the mixing plant and manually transferred into the additive silo, from where it is dosed into the powder mixer. Other additives are also added to the powder mixer. The formulated powder product (containing 0.2% notified chemical) is bagged or filled in supersacks and palletted for distribution to customers. Sometimes, it is filled in dry mortar silos for onsite positioning.

For mortar production, the dry mortar mix is transferred into the mortar mix and mixed with water, sometimes with other optional ingredients, to produce fresh mortar. Finished fresh mortar is then poured into place and/or finished manually with trowels etc. Some other industrial applications may use high pressure shotcrete or mortar gun for final placing and finishing.

The notifier has indicated that workers will wear goggles, gloves and dust masks during the above processes.

6. EXPOSURE INFORMATION

6.1. Summary of Environmental Exposure

- Possible environmental release will be in the form of dust during bag opening and transfer. This is unlikely to be a significant route.
- The ultimate fate of the polymer is to be bound within the cement matrix.
- Rinsings together with excess mortars are collected for controlled disposal. Rinsing waters from equipment cleaning are unlikely to be released to sewer because:
 1. mortars mixed on site are typically prepared in buckets or small mixers where excess mortar is removed and transferred to a dumpster to harden. Buckets typically remain uncleaned and are simply collected for disposal; and
 2. mortars mixed in an industrial site may be prepared in larger fixed mounted equipment which necessarily have to collect rinsings in dumpsters in order to let solids settle and harden. Release of uncleaned rinsings to sewer would result in plugging of the pipes as cementitious material will settle and harden.
- While no data were provided on persistence, the MSDS states the polymer is not readily biodegradable.

6.2. Summary of Occupational Exposure

Dermal, ocular and inhalation exposure can only occur to the pure notified polymer during opening of the bag and transferring the notified polymer into the powder mixer. Exposure can also occur during reformulation process while mixing all the ingredients, however exposure will be low as the notified polymer is present at the low concentration (0.2%) in these products. Exposure will be further minimised by the use of goggles, gloves and dust mask during all the processes.

During transport and storage, workers are unlikely to be exposed to the notified polymer except when packaging is accidentally breached.

6.3. Summary of Public Exposure

The notified polymer will mostly be used by the industry. Members of the public may come into contact with the finished cement containing the notified polymer. However, exposure will be negligible as the notified polymer is present at a low concentration (0.2%) and is integrally bound within the hardened cementitious matrix of concrete, making the notified polymer almost totally unavailable.

7. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa	Yellowish powder
Melting Point/Glass Transition Temp	Not determined
Bulk density	300-600 kg/m ³
Water Solubility	>549 g/L at 20°C based on content in imported aqueous solution. No test provided. The submission states that experimental evidence shows solubility can be higher than this, but those solutions become extremely viscous and are of no technical relevance.
Dissociation Constant	Contains carboxylic groups which are expected to show typical pKa values.
Particle Size	Not determined
Reactivity	Not expected to undergo further reactions under normal environmental conditions
Degradation Products	Not expected to substantially degrade, decompose or depolymerise under normal environmental conditions

8. HUMAN HEALTH IMPLICATIONS

8.1. Toxicology

The following toxicological study was submitted:

<i>Endpoint</i>	<i>Result</i>	<i>Classified?</i>	<i>Effects Observed?</i>
Rat, acute oral	LD ₅₀ >2000 mg/kg bw	No	No

The result was indicative of low hazard.

8.2. Human Health Hazard Assessment

The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard as supported by the acute oral toxicity result. The powder may also cause mechanical irritation to the eyes, and to the respiratory tract if inhaled. Repeated or prolonged skin contact and inhalation exposure may result in mild irritation.

9. ENVIRONMENTAL HAZARDS

9.1. Ecotoxicology

No ecotoxicity data were provided. The MSDS refers to a 48 h EC50 >100 mg/L for *Daphnia magna* based on a similar product. The main constituent in this high molecular weight polymer is known to show environmental toxicity, with an LC50 to fish of >10,000 ppm and an EC50 to *Daphnia* of >10,000 ppm. High levels of this constituent are also present residually in the notified polymer.

No data on terrestrial organisms are available.

9.2. Environmental Hazard Assessment

Without test data, the hazard of the polymer to organisms in the environment is unclear. The formulation contains approximately 10% of the residual constituents discussed above. This is not expected to be hazardous to the aquatic environment based on toxicity data provided in Section 9.1

The notified polymer is unlikely to exhibit acute toxicity to aquatic organisms based on the toxicity profile of the three main monomers, and methods for classifying mixtures for aquatic hazard under the GHS. In this instance, more than 90% of the mixture may be considered practically non-toxic to aquatic organisms based on testing and modelling, so the mixture is unlikely to require classification. Therefore, it may be considered non-hazardous to the aquatic compartment.

However, polycarboxylate polymers may exhibit toxicity to aquatic organisms, particularly algae, due to their metal chelating ability, a characteristic which is enhanced when carboxylic acid groups are positioned such that they are separated by one carbon atom on the polymer backbone. This functional group occurs in the notified polymer, so toxicity may be exhibited to some aquatic organisms, particularly algae.

10. RISK ASSESSMENT

10.1. Environment

No meaningful predicted environmental concentration (PEC), or predicted no-effect concentration (PNEC) can be derived hence, a PEC/PNEC calculation can not be undertaken. However, based on exposure arguments, and the unlikely hazardous nature of the compound to the aquatic environment, the risk of use of this notified chemical is not expected to be high.

While there are insufficient data to determine likely hazards to the terrestrial compartment, exposure again is expected to be very small and based on this, the corresponding risk is also expected to be small.

10.2. Occupational health and safety

The OHS risk presented by the notified polymer is expected to be low. The notified polymer may be present in formulations containing hazardous ingredients. If these formulations 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.

The level of atmospheric nuisance dust should be maintained as low as possible. The NOHSC exposure standard for atmospheric dust is 10 mg/m³.

10.3. Public health

The risk to public health will be negligible because the notified polymer is present at a low concentration and is to be integrally bound within the hardened cementitious matrix of concrete, rendering the notified chemical almost totally unavailable. 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 when used according to the conditions described in this notification.

12. MATERIAL SAFETY DATA SHEET

Material Safety Data Sheet

The notifier has provided a 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.
- Atmospheric monitoring should be conducted by the notifier to measure workplace concentration of nuisance dust during reformulation of the notified polymer.
- 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

- Prevent uncontrolled release into the environment.

Disposal

- **Product:** Excess product containing the notified chemical should be collected and allowed to harden prior to disposal to landfill.
- **Packaging:** Packaging which can not be reused or recycled should be disposed of to landfill or in accordance with local regulations.

Emergency Procedures

- Dike or contain spill. Avoid excessive dust generation. Sweep or vacuum spillage and

collect in a suitable container for disposal to landfill or in accordance with local regulations.

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.

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.

No additional secondary notification conditions are stipulated.