File No PLC/1277

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

POLYMER OF LOW CONCERN PUBLIC REPORT

Polymer in Melflux 2641 F

This Assessment has been compiled in accordance with the provisions of the *Industrial Chemicals (Notification and Assessment) Act 1989* (the Act) and Regulations. The National Industrial Chemicals Notification and Assessment Scheme (NICNAS) is administered by the Australian Government Department of Health, and conducts the risk assessment for public health and occupational health and safety. The assessment of environmental risk is conducted by the Australian Government Department of the Environment.

For the purposes of subsection 78(1) of the Act, this Public Report may be inspected at our NICNAS office by appointment only at Level 7, 260 Elizabeth Street, Surry Hills NSW 2010.

This Public Report is also available for viewing and downloading from the NICNAS website or available on request, free of charge, by contacting NICNAS. For requests and enquiries please contact the NICNAS Administration Coordinator at:

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Director
NICNAS

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SUMMARY

The following details will be published in the NICNAS *Chemical Gazette:*

ASSESSMENT REFERENCE	APPLICANT(S)	CHEMICAL OR TRADE NAME	HAZARDOUS SUBSTANCE	INTRODUCTION VOLUME	USE
PLC/1277	BASF Australia Ltd	Polymer in Melflux 2641 F	No	≤ 50 tonnes per annum	Component of cement

CONCLUSIONS AND REGULATORY OBLIGATIONS

Human Health Risk Assessment
Based on the assumed low hazard and the assessed use pattern, the notified polymer is not considered to pose an unreasonable risk to the health of workers and the public.

Environmental Risk Assessment
Based on the assumed low hazard and the assessed use pattern, the notified polymer is not considered to pose an unreasonable risk to the environment.

Health and Safety Recommendations

- 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 (M)SDS should be easily accessible to employees.

- If products and mixtures containing the notified polymer are classified as hazardous to health in accordance with the *Globally Harmonised System of Classification and Labelling of Chemicals (GHS),* as adopted for industrial chemicals in Australia, workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation should be in operation.

Disposal

- Where reuse or recycling are not appropriate, dispose of the notified polymer in an environmentally sound manner in accordance with relevant Commonwealth, state, territory and local government legislation.

Storage

- The following precautions should be taken by workers regarding storage of the notified polymer:
  - Store in a segregated and approved area.
  - Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (oxidising substances, strong acids, strong bases).

Emergency Procedures

- Spills and/or accidental release of the notified polymer should be handled by physical containment, collection and subsequent safe disposal.

Secondary Notification

This risk assessment is based on the information available at the time of notification. The Director may call for the reassessment of the polymer under secondary notification provisions based on changes in certain circumstances. Under Section 64 of the *Industrial Chemicals (Notification and Assessment) Act (1989)* the notifier, as well as any other importer or manufacturer of the notified polymer, have post-assessment regulatory obligations to notify NICNAS when any of these circumstances change. These obligations apply even when the notified polymer is listed on the Australian Inventory of Chemical Substances (AICS).

Therefore, the Director of NICNAS 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
- the function or use of the notified polymer has changed from a component of cement, or is likely to change significantly;
- the amount of notified polymer being introduced has increased, or is likely to increase, significantly;
- the notified polymer has begun to be manufactured in Australia;
- additional information has become available to the person as to an adverse effect of the notified polymer on occupational health and safety, public health, or the environment.

The Director will then decide whether a reassessment (i.e. a secondary notification and assessment) is required.

(Material) Safety Data Sheet

The (M)SDS of a product containing the notified polymer was provided by the applicant. The accuracy of the information on the (M)SDS remains the responsibility of the applicant.

ASSESSMENT DETAILS

1. APPLICANT AND NOTIFICATION DETAILS

Applicants
BASF Australia Ltd (ABN: 62 008 437 867)
Level 12, 48 Freshwater Place
SOUTHBANK VIC 3006

Exempt Information (Section 75 of the Act)
Data items and details claimed exempt from publication: chemical name, other names, CAS number, molecular and structural formulae, molecular weight, polymer constituents, residual monomers/impurities, use details and import volume.

2. IDENTITY OF POLYMER

Marketing Name(s)
Melflux 2641 F (contains the notified polymer at < 20% concentration).

Molecular Weight
Number Average Molecular Weight (Mn) is > 1,000 Da.

3. PLC CRITERIA JUSTIFICATION

Criterion	*Criterion met*
Molecular Weight Requirements	Yes
Functional Group Equivalent Weight (FGEW) Requirements	Yes
Low Charge Density	Yes
Approved Elements Only	Yes
Stable Under Normal Conditions of Use	Yes
Not Water Absorbing	Yes
Not a Hazard Substance or Dangerous Good	Yes

The notified polymer meets the PLC criteria.

4. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20 °C and 101.3 kPa	Powder
Melting Point/Glass Transition Temp	Not determined (decomposes)
Density	Not determined
Water Solubility	504 g/L at 20 °C
Dissociation Constant	Not determined. The notified polymer is a salt and is expected to be ionised under environmental conditions
Particle Size	Inhalable fraction < 100 µm: ~ 35%. Respirable fraction < 10 µm: ~ 7%
Reactivity	Stable under normal environmental conditions
Degradation Products	None under normal conditions of use

5. INTRODUCTION AND USE INFORMATION

Maximum Introduction Volume of Notified Chemical (100%) Over Next 5 Years

Year	*1*	*2*	*3*	*4*	*5*
Tonnes	30-50	30-50	30-50	30-50	30-50

Use
The notified polymer will be used as a component of cement.

The notified polymer will not be manufactured in Australia. The notified polymer will be imported as a component of the cement additive Melflux 2641 F in powder form at < 20% concentration. Melflux 2641 F will be mixed with other additives to form a dry mortar mix containing the notified polymer at up to 0.5% concentration. The dry mix will be reformulated at end use locations with water and other ingredients to produce fresh mortar containing the notified polymer at up to 0.05% concentration. The mortar will be applied by pouring or high pressure shotcrete systems.

6. HUMAN HEALTH RISK ASSESSMENT

The notified polymer meets the PLC criteria and is therefore assumed to be of low hazard. This is supported by tests submitted on the following toxicological endpoints.

Endpoint	*Result*	*Effects Observed?*	*Test Guideline*
Rat, acute oral	LD50 > 2000 mg/kg bw	no	OECD TG 423
Rabbit, skin irritation	non-irritating	no	OECD TG 404
Rabbit, eye irritation	non-irritating	no	OECD TG 405

All results were indicative of low hazard.

Although not considered in this risk assessment, NICNAS notes that the notified polymer contains residual monomers that are classified as hazardous according to the *Globally Harmonised System of Classification and Labelling of Chemicals (GHS),* as adopted for industrial chemicals in Australia. These are not present in the notified polymer as introduced above the cut off concentrations for classification.

The notified polymer contains a small fraction (< 10%) of respirable size particles (< 10 μm). The notified polymer is highly water soluble and has a molecular weight < 10,000 Da hence lung overloading effects are not expected.

The risk of the notified polymer to occupational and public health is not considered to be unreasonable given the assumed low hazard and the assessed use pattern.

7. ENVIRONMENTAL RISK ASSESSMENT

Anionic polymers are generally of low toxicity to fish and daphnia, however they are known to be moderately toxic to algae. The mode of toxic action is over-chelation of nutrient elements needed by algae for growth. The highest toxicity is when the acid is on alternating carbons of the polymer backbone, which may apply to the notified polymer. However, the toxicity to algae is likely to be reduced due to the presence of calcium ions in environmental waters, which will bind to the functional groups. Furthermore, given that limited release to the environment is expected from the proposed use pattern, the notified polymer is not expected to reach ecotoxicologically significant concentrations in the environment.

The notified polymer will be imported in solid form as a dispersant in cement-based construction materials to be reformulated into finished cement for construction and engineering applications. During reformulation, the notified polymer will be dry-mixed with other cementing additives in manually operated mixing silos, then packaged within an automated system. Release of the notified polymer to the environment during import, reformulation, storage, and transport is expected to be limited to accidental spills or leaks and residue in import packaging (estimated to be ≤ 1% by the notifier, or up to 500 kg). Spills or accidental release of the products containing the notified polymer

are expected to be collected and disposed of to landfill in accordance with local government regulations.

The notified polymer will be used as cement in construction and engineering applications. The dry cement containing the notified polymer will be mixed into finished cement with water and other cementing additives at the site of application, and applied manually or using high pressure shotcrete systems. Any unused wet cement will be allowed to cure before being collected for disposal. Once cured, the notified polymer will be irreversibly bound to the cement matrix and share the fate of the cement, which is ultimately expected to be disposed of to landfill in accordance with local government regulations. It was estimated by the notifier that ≤ 1%, or up to 500 kg of the notified polymer will remain in empty packaging as container residue. Empty packaging will be disposed of to landfill in accordance with local government regulations.

The results from an ecotoxicological investigation conducted on the notified polymer are summarised in the table below.

Endpoint	*Result*	*Assessment Conclusion*
Daphnia Toxicity	48 h EC50 > 1000 mg/L	Not harmful to daphnids

Based on the above endpoint, the notified polymer is not considered to be harmful to daphnids. Therefore, the notified polymer is not formally classified under the Globally Harmonised System of Classification and Labelling of Chemicals (GHS) for acute and chronic toxicities.

Based on its high molecular weight and chemical structure, the notified polymer is not expected to be readily biodegradable. Due to its high molecular weight, the notified polymer is not expected to cross biological membranes and is, therefore, not expected to bioaccumulate. Once cured, the notified polymer will share the fate of the cement into which it is bound, and is not expected to be bioavailable nor mobile. In landfill, the notified polymer is expected to eventually degrade by biotic and abiotic processes to form water and oxides of carbon.

A predicted environmental concentration (PEC) has not been calculated since no significant release of the notified polymer to the aquatic compartment is expected from the reported usage pattern.

A predicted no-effect concentration (PNEC) for the aquatic compartment has not been calculated since the notified polymer is not expected to be harmful to aquatic organisms.

The Risk Quotient (Q = PEC/PNEC) has not been calculated since the PEC and PNEC have not been calculated. The notified polymer is not expected to be harmful to aquatic organisms, and no significant release to the aquatic compartment is anticipated.

Therefore, based on its assumed low hazard, the notified polymer is not considered to pose an unreasonable risk to the environment.