

File No PLC/748

05 February 2008

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

FULL PUBLIC REPORT

Starvis 3003 F

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

For the purposes of subsection 78(1) of the Act, this Full Public Report may be inspected at our NICNAS office by appointment only at 334-336 Illawarra Road, Marrickville NSW 2204.

This Full 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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FULL PUBLIC REPORT**Starvis 3003 F****1. APPLICANT AND NOTIFICATION DETAILS**

APPLICANT(S)

International Sales and Marketing Pty Ltd (ABN 36 467 259 314)
262 Highett Road
Highett, VIC 3190

NOTIFICATION CATEGORY

Polymer of Low Concern

EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication:

Chemical Name, CAS Number, Molecular and Structural Formulae, Spectral Data, Molecular Weight, Polymer Constituents, Residual Monomers/Impurities, Use Details, Import Volume and Site of Reformulation.

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

Environment Canada (2002); U.S. EPA (2004)

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

Starvis 3003 F

MOLECULAR WEIGHT (MW)

Number Average Molecular Weight (Mn) >100000 Da

Reactive Functional Groups

The notified polymer contains only low concern functional groups.

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.

*The notified polymer is potentially water absorbing at high concentrations where it becomes highly viscous. Whilst the notified polymer belongs to a class of polymers, which are potentially water absorbing, the notified polymer is soluble in water and therefore is considered to meet the PLC criteria.

4. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa:	Solid Powder
Melting Point	>260°C
Density	Polymer density was not determined; the bulk density is 250-400 kg/m ³
Water Solubility	150 g/L at 20°C The notified polymer is considered completely soluble in water. It is originally produced as an approximately 16% aqueous polymer solution, which has a density of approximately 1.06 g/cm ³ . This gives a calculated solubility of 150 g/L.
Dissociation Constant	Not determined. Contains a very acidic functionality, which will be ionised throughout the environmental pH range.
Particle Size	< 11 µm: 3.9% and < 105 µm: 42.5%
Reactivity	Stable under normal environmental conditions
Degradation Products	None under normal conditions of use. The notified polymer contains hydrolysable functionalities but is not expected to hydrolyse in environmental pH of 4-9.

5. INTRODUCTION AND USE INFORMATION

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

Year	1	2	3	4	5
Tonnes	1-5	1-5	1-5	1-5	1-5

Use

The notified polymer is used as a polymer additive for dry mortar, at concentrations of < 0.5% w/w.

Mode of Introduction and Disposal

The notified polymer will not be manufactured within Australia. It will be imported through the port of Sydney as a powder in 20 kg bags before being transported to a warehouse. The notified polymer will then be transported by road to reformulation sites in NSW and WA.

Operation description

Reformulation

The notified polymer at concentrations of > 90% (may contain up to 10% water) will be delivered to the reformulation plants in 20 kg bags. The bags will be cut open, and the contents transferred to an additive silo from where the notified polymer will be dosed into the powder mixer. Empty bags containing less than 100 g of the notified polymer will be disposed of to landfill. The notified polymer will be blended in the powder mixer with the other components that will be present in the mortar. Reformulation is estimated to take place on approximately 40 days per year. The mortar containing the notified polymer is then packed in 20 kg sacks for sale. Dust extraction systems will be used during the reformulation of the notified polymer.

Concrete Manufacture

At the concrete production plant the sacks of mortar containing the notified polymer at concentrations < 0.5% will be transferred to the mortar mixer where they will be blended with water and occasionally other components to produce the final concrete mixture. Concrete manufacture is expected to take place on approximately 40 days per year.

Mortar placing and application

The finished concrete mixture (containing the notified polymer at of < 0.5%) will be poured into place or applied manually by construction workers.

6. HUMAN HEALTH IMPLICATIONS

Hazard Characterisation

The notified polymer meets the PLC criteria, and is therefore assumed to be of low hazard. This assumption is supported by toxicological endpoints observed in testing conducted on the notified polymer.

<i>Endpoint</i>	<i>Result</i>	<i>Effects Observed?</i>	<i>Test Guideline</i>
Skin sensitisation - adjuvant test	no evidence of sensitisation	yes	OECD TG 406 (Maximisation test)

The effects observed in the skin sensitisation test were as follows: Following induction discrete or patchy to moderate and confluent erythema was observed in all test group animals at the 24 and 48 hour observations in both the test and control group animals. Dermal challenge elicited no responses that were indicative of sensitisation in any animals.

The particle size of the notified polymer indicates that a significant portion of the notified polymer will be inspirable with a small portion also respirable. The notified polymer has a high molecular weight and is water soluble but also potentially water absorbing and viscous at high concentrations in aqueous solutions. Respirable particles of water-absorbing polymers are a concern based on data showing that cancer was observed in a 2-year inhalation study in rats on a high molecular weight water-absorbing polyacrylate polymer (USEPA). However, this concern is only for water-absorbing polymers that are also insoluble, unlike the notified polymer, which is water soluble. If the notified polymer is inhaled at low levels, it is likely to be cleared from the upper respiratory tract readily through mucociliary action. Small proportions of the notified polymer may reach the lower respiratory tract, but it should still be readily cleared from the lungs unless high levels are inhaled. When high concentrations of the notified polymer are inhaled, it is likely to be cleared from the lungs, but this may be slower and temporary respiratory impairment is possible.

Occupational Health and Safety Risk Assessment

Reformulation

Dermal, ocular and inhalation exposure to the notified polymer may potentially occur during its reformulation. The greatest potential for exposure is during the opening of the imported bags of notified polymer and transfer to the additive silo. During repackaging and storage of the blended mortar, exposure is expected to be low due to the low concentration of the notified polymer. At the reformulation sites exposure to the notified polymer will be reduced through the use of local exhaust ventilation, and the use of PPE by workers, including goggles, gloves and dust masks. The greatest risk to workers during reformulation is from inhalation exposure during opening and transfer of the notified polymer from the bags that it is imported in, however the risk is expected to be low due to the controls used and assumed low hazard of the notified polymer. Given that the NOHSC exposure standard for Portland cement (a component of mortar) is 10 mg/m³ TWA, concentrations of airborne particulates are likely to be kept below this level.

Concrete manufacture

Dermal, ocular and inhalation exposure to the notified polymer may potentially occur during concrete manufacture. Exposure may be from either the dry mortar or the prepared concrete (both containing the notified polymer at < 0.5%). Exposure to the notified polymer may occur during the transfer of the dry mortar from the 20 kg sacks to the mortar mixing equipment, or during cleaning of equipment. Exposure to significant amount of the notified polymer is unlikely during these processes, due to the low concentration of the notified polymer and the PPE that is claimed to be worn by workers including goggles, dust masks and gloves. The risk to workers from the notified polymer during concrete manufacture is considered to be low due to its assumed low hazard and the low concentration of the notified polymer in the mortar.

Mortar placing and application

Construction workers may have inhalation, dermal and ocular exposure to the dry mortar and prepared concrete (containing the notified polymer at < 0.5%), however exposure to the notified polymer would likely be limited due to its low concentration. The risk to workers during mortar placing and application is considered to be low due to the assumed low hazard of the notified polymer and low concentration of the notified polymer in the mortar. Construction workers would also experience extensive exposure to the solidified concrete containing the notified polymer. However, in this state the notified polymer will be bound within the hardened matrix of the concrete, and will be unavailable for exposure.

Public Health Risk Assessment

The notified polymer is intended only for use in industry and as such public exposure to the notified chemical is not expected. The public may come into contact with hardened concrete containing the notified polymer, however, in this state the notified polymer will be bound within the hardened matrix of the concrete, and will be unavailable for exposure.

7. ENVIRONMENTAL IMPLICATIONS**ENVIRONMENTAL RELEASE**

Any spills that occur during reformulation will be contained by bunding. Approximately 20 g per bag of waste is expected to be generated. A licensed waste disposal contractor will collect the aqueous waste from the concrete manufacturing process for treatment with flocculants prior to burying the solids in a secure landfill.

Although most water during reformulation and use in concrete batching will be recycled, small amounts (< 1%) of the notified polymer (<50 kg per annum) may be released to the sewer from the processing plants.

Concrete trucks will usually be rinsed at the end of the day after several batches. Approximately 1-4% of the concrete will adhere to the inside of the drums. If four batches are assumed between rinses then the amount of notified polymer in the excess concrete and water will amount to less than 1% (<50 kg per annum). These washings from concrete trucks are expected to be contained in a wash water system, which will be recycled for future concrete manufacture to the extent practicable. Some wastewater may be associated with the waste concrete and be allowed to evaporate as the concrete cures, with the notified polymer becoming associated with the waste concrete. Any excess concrete is expected to be transferred to dumpsters where the concrete will be allowed to cure with subsequent disposal in authorised landfill.

ENVIRONMENTAL FATE

The notified polymer is water soluble, expected to be hydrolytically stable and not expected to be readily biodegradable. On the basis of its water solubility, the notified polymer is likely to be mobile in soils. Although it contains hydrolysable functionalities, the notified polymer should not hydrolyse in the environment; rather, it is expected to slowly degrade into oxides of carbon and water. The notified polymer's high molecular weight will preclude absorption across biological membranes and thus it is unlikely to bioaccumulate.

ENVIRONMENTAL RISK ASSESSMENT

No ecotoxicological data were submitted. Anionic polymers 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. This is unlikely to apply to the notified polymer. The toxicity to algae is likely to be further reduced due to the presence of calcium ions, which will bind to the functional groups.

The notified polymer will be used in concrete, and will be bound up in the hardened concrete matrix. Release to the environment is expected to be minimal. Therefore, it is not possible to calculate the Predicted Environmental Concentration (PEC) or Predicted No Effect Concentration (PNEC), and thus, a PEC/PNEC calculation cannot be undertaken. However, the PEC/PNEC will be very low, based on exposure arguments, and given the limited hazardous nature of the notified polymer to the aquatic environment, the risk of use of this notified polymer is expected to be acceptable.

8. CONCLUSIONS AND RECOMMENDATIONS**Human health risk assessment**

Under the conditions of the occupational settings described, the notified polymer is not considered to pose an unacceptable risk to the health of workers.

When used in the proposed manner, the notified polymer is not considered to pose an unacceptable risk to public health.

Environmental risk assessment

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

Recommendations

CONTROL MEASURES

Occupational Health and Safety

- Employers should implement the following engineering controls to minimise occupational exposure to the notified polymer at the reformulation sites during transfer of the notified polymer as introduced.
 - Local exhaust ventilation
- Employers should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified polymer at the reformulation sites during transfer of the notified polymer as introduced.
 - Dust mask or respirators capable of removing all product particles

Guidance in selection of personal protective equipment can be obtained from Australian, Australian/New Zealand or other approved standards.

- At the reformulation sites, atmospheric monitoring should be conducted to measure workplace concentrations of airborne particulates during handling of the notified polymer. Airborne concentrations of the notified polymer should not exceed the exposure standard of 10 mg/m³ TWA for airborne particulates not otherwise classified [NOHSC:1003(1995)].
- 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 *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008(2004)], 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 to landfill.

Storage

- Keep in a dry place.

Emergency procedures

- Spills and/or accidental release of the notified polymer should be handled by sweeping and shovelling and flush with plenty of water.

Regulatory Obligations

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 chemical 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 chemical, have post-assessment regulatory obligations to notify NICNAS when any of these circumstances change. These obligations apply even when the notified chemical 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 chemical has changed from a polymer additive for dry mortar at concentrations of < 0.5% w/w, or is likely to change significantly;
- the amount of chemical being introduced has increased from five tonnes, or is likely to increase, significantly;
- if the chemical has begun to be manufactured in Australia;
- additional information has become available to the person as to an adverse effect of the chemical 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.

No additional secondary notification conditions are stipulated.

Material Safety Data Sheet

The MSDS of the notified chemical provided by the notifier was reviewed by NICNAS. The accuracy of the information on the MSDS remains the responsibility of the applicant.