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July 2002

**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION  
AND ASSESSMENT SCHEME**

**FULL PUBLIC REPORT**

**Flowkit FL-51**

This Assessment has been compiled in accordance with the provisions of the *Industrial Chemicals (Notification and Assessment) Act* 1989 (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 National Occupational Health and Safety Commission which also conducts the occupational health & safety assessment. The assessment of environmental hazard is conducted by the Department of the Environment and the assessment of public health is conducted by the Department of Health and Aged Care.

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Copies of this full public report may also be requested, free of charge, by contacting the Administration Coordinator on the fax number below.

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**FULL PUBLIC REPORT****FLOWKIT FL-51****1. APPLICANT**

National Starch and Chemical Company of 7 Stanton Road, Seven Hills, NSW (ABN 37 000 351 806) has submitted a notification statement in support of their application for an assessment certificate for the synthetic polymer of low concern (PLC) Elotex FLOW 8200.

**2. IDENTITY OF THE CHEMICAL**

The chemical name, CAS number, molecular and structural formulae, molecular weight, spectral data and details of the polymer composition have been exempted from publication in the Full Public Report.

**Marketing names:** **Elotex FLOW 8200**

**3. POLYMER COMPOSITION AND PURITY**

Details of the polymer composition have been exempted from publication in the Full Public Report.

**Purity (%):** >99.9%

**4. PLC JUSTIFICATION**

The notified polymer meets the PLC criteria.

**5. PHYSICAL AND CHEMICAL PROPERTIES**

<b>Property</b>	<b>Result</b>	<b>Comments</b>
<b>Appearance</b>	Solid, White powder	
<b>Boiling point</b>	Not Applicable	
<b>Density</b>	1000 kg/m <sup>3</sup>	
<b>Water solubility</b>	Significantly	Highly soluble – contains several

<b>Particle size</b>	Soluble Mean 50.7 µm Range 3 – 300 µm 1% respirable	acidic and hydrophilic functionalities.
<b>Flammability</b>		
<b>Autoignition temperature</b>	>200°C	
<b>Explosive properties</b>	Lower explosive limit 15 g/m <sup>3</sup>	
<b>Stability/reactivity</b>		No decomposition under standard conditions. May decompose above 150°C
<b>Hydrolysis as function of pH</b>	Not determined	The notified polymer contains an ester linkage that could be expected to undergo hydrolysis. However it is unlikely to do so in the environmental pH range of 4-9.
<b>Partition coefficient</b>	Not determined	Due to the notified polymer's expected water solubility (≥ 20%) it is likely to partition into the aqueous phase.
<b>Adsorption/desorption</b>	Not determined	As a consequence of its expected hydrophilicity the notified polymer is likely to be mobile in soil, though this may be offset by binding to metal ions on the soil surface.
<b>Dissociation constant</b>	Not determined	The notified polymer is expected to remain substantially dissociated in the environmental pH range of 4-9.

### 5.1 Comments on physical and chemical properties

No test reports or supporting documentation for the physical and chemical properties (except particle size) were supplied by the notifier. The properties are reported here as they appear on the MSDS.

## 6. USE, VOLUME AND FORMULATION

### Use:

The notified polymer is a component of a redispersable polymer binder Flowkit FL-51, which will be incorporated into dry mortar powder products at a concentration of < 1%. It can be blended with other dry additives to produce an end use product (EUP) in powdered form (mortar mix). In Australia the EUP is intended for use as a smoother for concrete slabs on which vinyl, carpets or tiles are laid.

### Manufacture/Import volume:

One tonne of Flow 8200 will be imported in the first year, rising to 5 tonnes at year 5. Manufacture of the notified polymer will occur outside Australia.

#### **Formulation details:**

Once in Australia it is expected that Flowkit FL-51 will be incorporated into dry mortar mix as a powdered EUP. Formulation is proposed to take place at mineral powder blending organisations. For constitution into the EUP, Flowkit FL-51 will be added to a closed mixing vessel, mixed, then packed off into commercial paper bags.

## **7. OCCUPATIONAL EXPOSURE**

Two exposure scenarios exist, as an old 600 L mild steel plant (20 minute processing time), operates concurrently with a new 2000 L stainless steel sealed mixer machine (90 seconds processing time).

In the old plant, the notified polymer is added through a veneration system involving air suction. The hopper has a close/open slide gate valve, which opens during addition of materials, then closes and material is blown up into the reactor vessel, which is fitted with dust extractors. The finished product is packed via a manually handled packing machine.

In the new plant, the notified polymer and other ingredients (sand, polymer additives, flow additives, retardant additives, fine silica, accelerators, calcium carbonate and powder polymer) are added via a vacuum system. A pot is attached to the mixing vessel with a suction line attached. After addition of the material, the entry valve to the pot closes, then positive air pressure blows the contents into the vessel, which also has dust extractors. After compounding, the finished dry mortar mix is transferred by pipeline to a gravity fed hopper located above the packing machine and robotically packed into 20, 25 or 40 kg paper sacks.

The end use mortar mix containing <1% of the notified polymer will be sent to customers for use in commercial premises such as shops and offices. The mortar product is used in smoothing of concrete slabs. The process involves mixing the mortar with water in a ratio of 4:1 in a 20-L pail with a high-speed mixer, and pouring onto the floor. The mortar is hardened within 6 hours, and is insoluble once set.

The most likely exposure routes are inhalation and dermal. Some potential exists for exposure to dust, however, mechanical ventilation and extractors are used to trap airborne dust. The likely occupational exposure scenarios are as follows:

- Three forklift drivers will move the product containing the notified polymer from the warehouse to work area. Exposure will only occur in the event of a spill.
- Three charge hands will add the notified polymer to the system. These workers wear positive pressure airhoods because they handle fine silica particles.
- Three people will work on the pack off line. These workers will wear dust masks, gloves and goggles if dust is dispersed in the air.
- The product will be used by concreters at a construction site. Exposure to the product may be for eight hours per day, for most working days of the year. The applicators will wear overalls, safety boots and gloves. Respiratory protection may also be worn.

## **8. PUBLIC EXPOSURE**

The general public will be exposed to neither the imported product nor the end use product unless there is an accident during transportation.

The powder polymer upon contact with water forms a dispersion, and on drying forms an insoluble and non-bioavailable plastic fill. Hence public exposure to the notified polymer is considered to be negligible.

## 9. ENVIRONMENTAL EXPOSURE

### 9.1. Release

During manufacture into the EUP the notifier estimates that up to 3333 kg dust will be generated from the manufacture of 500 tonnes of dry mortar mix (year 5). Of the 3333 kg of dust generated, < 10 kg will be the notified polymer.

The mortar product is used for smoothing concrete slabs prior to the laying of floor coverings. The mixing process involves the addition of water to the mortar mix at a ratio of 4:1 in a 20 L pail with a high-speed mixer. This produces a pourable fluid, which is then applied to the floor and smoothed over. Large operators may use machines for mixing. Once the mix has set the polymer is insoluble due to a change. Powder polymer upon contact with water forms a dispersion and on drying forms an insoluble plastic fill. Limited waste may occur through excess fluid.

### 9.2. Fate

Dust from the manufacturing process is contained within a closed mixing system with a catching bin. The dust collected from this process will be recycled into concrete or road base.

The notifier has estimated that less than 2 kg of Flowkit FI-51 will be sent to landfill through residues contained in empty bags. This residue will be sent to industrial landfill through a licensed waste disposal contractor.

## 10. EVALUATION OF HEALTH EFFECTS DATA

No toxicological studies were submitted. Some health hazard information is present in the supplied MSDS. The notified polymer is likely to have low oral toxicity. The powder may cause mechanical irritation to the eyes, and to the respiratory tract if inhaled. Repeated or prolonged skin contact may result in mild irritation. Inhalation of powder may also cause irritation to the respiratory tract or choking if large amounts are involved.

Application of the nuisance dust exposure limit of 10 mg/m<sup>3</sup> is recommended (NOHSC:1003, 1995).

<b>Chemical</b>	<b>Health hazards</b>	<b>Regulatory controls</b> (NOHSC, 1995)
<b>Constituents</b>		
Vinyl Acetate		TWA 10 ppm (35 mg/m <sup>3</sup> )

**Hazardous impurities**

None

**Additives/adjuvants**

None

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**11. EVALUATION OF ENVIRONMENTAL EFFECTS DATA**

No ecotoxicological data were provided.

**12. ENVIRONMENTAL RISK ASSESSMENT**

The majority of the notified polymer will be incorporated into the matrix of dry mortar. Once solidified, the notified polymer is expected to pose minimum risk to the environment.

The main environmental hazard would arise from release of the notified polymer during reformulation, storage and transport. The use of bunded containment minimises the risk of release at manufacturing and storage sites. Less than 10 kg of notified polymer may be released to the environment annually via disposal of EUP packaging and manufacture, most of this will be recycled and trapped into concrete or road base.

The new chemical will be used as an ingredient of mortar formulations, and most will eventually be incorporated into the matrix of the mortar and as such pose minimum risk to the environment. The applicant has indicated the polymer has high water solubility but has not provided supporting data. Where high water solubility is indicated any material released would eventually partition to water. However, given the notified chemical's anionic nature it is expected to associate with metal ions in soil and sediments.

**13. HEALTH AND SAFETY RISK ASSESSMENT**

**13.1. Hazard assessment**

The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard.

The powder may cause mechanical irritation to the eyes, and to the respiratory tract if inhaled. Repeated or prolonged skin contact may result in mild irritation.

**13.2. 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 *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008(1999)], workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation must be in operation.

**13.3. Public health**

There is Negligible Concern to public health when the notified polymer is used in the manner outlined in this report.

## **14. MSDS AND LABEL ASSESSMENT**

### **14.1. MSDS**

The MSDS for the product containing 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 part of the assessment report. The accuracy of the information on the MSDS remains the responsibility of the applicant.

The MSDS for the notified polymer provided by the notifier was not in accordance with the NOHSC *National Code of Practice for the Preparation of Material Safety Data Sheets* (NOHSC, 1994a) as the notified polymer is not being manufactured in Australia, or imported other than as an ingredient in the product. It is published here as part of the assessment report. The accuracy of the information on the MSDS remains the responsibility of the applicant.

### **14.2. Label**

The label for the products containing the 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.

## **15. RECOMMENDATIONS**

### *Regulatory controls*

- An atmospheric concentration of 10 mg/m<sup>3</sup> for the imported product, Flowkit FL-51 is suggested, in accordance with section 14.28 of the *NOHSC Exposure Standards for Atmospheric Contaminants in the Occupational Environment*.

### *Control Measures*

#### Occupational Health and Safety

- Employers should implement the following engineering controls to minimise occupational exposure to the notified polymer as introduced in the product Flowkit F1-51:
  - General and/or local ventilation, or dust extraction systems sufficient to ensure the atmospheric concentration of all dust is <10 mg/m<sup>3</sup>
- Employers should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified polymer as introduced in the product Flowkit F1-51:
  - dust masks, gloves and goggles if dust is dispersed in the air.

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

- The following control measures should be implemented to minimise environmental exposure during formulation, and use of the notified polymer:
  - all wastes containing the notified substance should be disposed of in an approved manner by licensed waste contractors;.

#### Disposal

- The notified polymer should be disposed of to landfill.

#### Emergency procedures

- any spilt material must be contained and prevented from entering drains, streams or any water body. The material should be cleaned up and placed into a suitable container for later recycling or disposal of by a licensed waste contractor.

### 15.1 Secondary notification

The Director of Chemicals Notification and Assessment must be notified in writing within 28 days by the notifier, other importer or manufacturer:

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

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.

## 16. REFERENCES

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.

National Occupational Health and Safety Commission (1995) Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment, [NOHSC:1003(1995)]. In: Exposure Standards for Atmospheric Contaminants in the Occupational Environment: Guidance Note and National Exposure Standards. Australian Government Publishing Service, Canberra.

National Occupational Health and Safety Commission (1999) Approved Criteria for Classifying Hazardous Substances [NOHSC:1008(1999)]. Australian Government Publishing Service, Canberra.