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31 August 2004

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

**FULL PUBLIC REPORT**

**Polymer in Optiflo M2600 / M2600VF**

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**Director  
Chemicals Notification and Assessment**

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**FULL PUBLIC REPORT****Polymer in Optiflo M2600 / M2600VF****1. APPLICANT AND NOTIFICATION DETAILS**

## APPLICANT(S)

Amtrade International Pty Ltd (ABN 49 006 409 936)  
 Level 6, 574 St Kilda Road  
 Melbourne, Victoria 3004

## NOTIFICATION CATEGORY

Self Assessment: Polymer of Low Concern

## EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication:  
 Chemical identity information  
 Percentage of polymer in imported formulations  
 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)

None

## NOTIFICATION IN OTHER COUNTRIES

None

**2. IDENTITY OF CHEMICAL**

## MARKETING NAME(S)

Optiflo® M2600  
 Optiflo® M2600VF also referred to as TX-2050 – Experimental Hydrophone Modified Polymer  
 (No Cosolvent)

**3. COMPOSITION**

## PLC CRITERIA JUSTIFICATION

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

The notified polymer meets the PLC criteria. FGEW requirements do not apply due to the high molecular weight.

#### 4. INTRODUCTION AND USE INFORMATION

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

The notified polymer will not be manufactured in Australia but will be imported as a component of the product Optiflo® M2600. Initially, the imported product will be used at a single site located at Villawood, NSW. However, it is anticipated that market demand will increase and the product will be used Australia wide.

##### 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	< 50	< 50	< 50

##### USE

The notified polymer will be used as an associative thickener in water-based latex architectural paint formulations. The paints will be available for trade and public sale.

#### 5. PROCESS AND RELEASE INFORMATION

##### 5.2. Operation Description

The notified polymer will be imported either as a 23-27% solution in water and a glycol ether (Optiflo® M2600) or as a 18-22% solution in water and a proprietary non-volatile solvent (Optiflo® M2600VF, TX-2050). The polymer solutions will be imported in 200 L steel drums or 1000 L Intermediate Bulk Containers (IBCs). They will be transported from the dockside to an Amtrade chemical warehouse, such as in Ingleburn, NSW, or they will be transported directly to the warehouse of the paint manufacturer. The finished paint products will be sold to consumers through the trade and retail sectors.

At the paint manufacturer's warehouse, imported product drums and IBCs will be stored in banded areas. The drums or IBCs will be transferred via forklifts to the formulation areas. The imported products will be pumped from the containers to an enclosed blender where it will be mechanically mixed under local exhaust ventilation with other paint components, such as aqueous latexes and pigments, to produce finished paints containing <1% notified polymer. Following quality control analysis by laboratory technicians, the paint will be transferred using a mechanical pouring device to a range of containers, such as 1 L and 4 L cans or 20 L pails. The finished paints containing <1% notified polymer will then be transported to trade and retail outlets. Workers will wear appropriate personal protective equipment, including impervious gloves, coveralls, eye protection and respiratory protection, to minimise exposure to the notified polymer.

The finished paints will be used by the public or professional painters. It is expected that about 90% of the paints containing the notified polymer will be applied by paint brushes or rolls and about 10% will be applied using an airless spray. Painters typically lay down protective drop sheets over surfaces to protect them from drips, spills and overspray. Painters will clean the paint brushes and rollers with copious amounts of water.

#### 6. EXPOSURE INFORMATION

##### 6.1. Summary of Occupational Exposure

During transport and storage, workers are unlikely to be exposed to the notified polymer except when packaging is accidentally breached. In this event, they would be exposed to the notified polymer at concentrations of up to 18-27% if handling the imported product, or <1% if handling the finished paint products.

Dermal and ocular exposure may occur during the paint formulation process. Paint formulation workers may be exposed to polymer concentrations of up to 18-27%, depending on the imported product. The use of engineering controls (enclosed blender, local exhaust ventilation) and personal protective equipment (impervious gloves, safety goggles or safety glasses with side shields and

coveralls) will provide a high level of protection against the notified polymer. The MSDS indicate that the gloves should be composed of butyl rubber, nitrile rubber or neoprene. Hence, exposure to significant quantities of the notified polymer will be limited.

Occupational exposure during the sale and professional use of architectural paints is likely to be widespread and often under poorly controlled conditions. During the sale of the paints, retail workers are unlikely to be exposed to the notified polymer except when packaging is accidentally breached. Dermal exposure is likely to occur during paint application. Ocular exposure may also occur, although it is less likely compared to dermal exposure. Retail workers and professional painters would be exposed to polymer concentrations of <1%.

## **6.2. Summary of Public Exposure**

Paint products containing <1% notified polymer will be sold to the general public. Members of the public will make dermal contact and possibly accidental ocular contact with products containing the notified polymer. However, exposure will be low because the notified polymer will be present at low concentrations. After application and once dried, the paint containing <1% notified polymer will be cured into an inert matrix and will therefore, be unavailable to public exposure.

## **6.3. Summary of Environmental Exposure**

### **6.3.1. Environmental Release**

Since local manufacture of the notified polymer will not take place in Australia, there will be no environmental exposure associated with that process.

At the paint manufacturer's warehouse, the drums and IBCs containing the imported products will be stored in bunded areas. Environmental release during the reformulation process will be minimised by the use of sealed systems. The paint manufacturer advised that liquid wastes generated from spills, leaks and equipment cleaning will be directed to an on-site wastewater treatment plant. The wastewater treatment plant is isolated from the sewer system. It only discharges to sewer under licensed conditions in accordance with State/Territory legislative requirements. Due to the chemistry of the polymer, the polymer manufacturer advised that it is expected that the majority of the polymer will adsorb to the latex in the paint formulations and therefore, will partition to the solid phase through the wastewater treatment process. Only a negligible amount may be expected to partition to the water phase during the wastewater treatment process at the paint manufacturer's facility. There is no solvent reclamation process. The sludge generated from the wastewater treatment plant, containing the majority of the polymer, will be disposed of via a licensed waste transporter to a licensed waste facility where it may receive further treatment prior to disposal to landfill or incineration in accordance with State/Territory and Commonwealth legislative requirements.

Imported product containers (IBCs and steel drums) will not be rinsed out at the paint formulation site. They will be recycled by licensed container recyclers in accordance with State/Territory and Commonwealth legislative requirements.

The majority of the notified polymer will be applied by public or professional painters to various substrates and cured into a solid paint coating.

During application, painters will typically minimise environmental release by laying down plastic or material drop sheets to capture and contain any drips, spills or overspray of the finished paint products (containing <1% notified polymer). The drop sheets and paint cans/pails containing residual paint, usually in a hardened, cured form, will typically be disposed of to landfill via domestic waste collection services.

During cleaning of paint application equipment, such as brushes, rollers and possibly airless spray equipment, it is expected that paint waste (containing <1% notified polymer) will be washed into the sewerage system with copious amounts of water.

### **6.3.2. Environmental Fate**

The majority of the notified polymer will be applied to various substrates and cured into a solid paint coating. The polymer will share the fate of these substrates, with eventual disposal to landfill or incineration. The notified polymer is expected to be immobilised within the cured paint matrix and it is

considered unlikely that it would biodegrade or leach from the cured paint. This would also be the case for cured paint on painters' drop sheets or residual cured paint in emptied paint cans/pails that are disposed of to landfill.

The notified polymer is water soluble and will partition to the water phase, which would be the case with paint formulations (containing <1% notified polymer) that are washed into sewerage systems during cleaning of paint equipment. The notified polymer may also leach to a degree from uncured residual paint or sludge, in the event that is disposed of to landfill. Based on the polymer chemistry, it is expected that the polymer could persist in solution as it will most likely be present in concentrations far below its saturation point.

The polymer manufacturer advised that during the wastewater treatment process at the paint manufacturing facility, it is expected that the majority of the polymer will adsorb to the latex in the paint formulations and therefore, is more likely to partition to the solid phase in the wastewater treatment processes.

Polymer sent to landfill is expected to remain associated with the soils and sediments and would not be expected to leach into the aquatic environment when bound into the paint matrix.

In the event that waste material containing the notified polymer is incinerated, it is expected that the likely combustion products will be oxides of carbon and nitrogen.

Distribution of the final paint products is expected to be wide-spread, causing dispersion of the notified polymer in receiving environments, primarily landfills and waterways. However, it is expected to biodegrade slowly to water, carbonate and nitrate or ammonia. The notified polymer is not expected to bioaccumulate or cross biological membranes, due to its high molecular weight (>1,000 daltons).

## 7. ESTABLISHMENT OF LOW PHYSICAL AND CHEMICAL HAZARD

<b>Appearance at 20°C and 101.3 kPa</b>	White solid (notified polymer) White or off-white liquid, mild, not unpleasant odour (Optiflo® M2600)
<b>Melting Point/Glass Transition Temp</b>	0°C (Optiflo® M2600)
<b>Density</b>	1,040 kg/m <sup>3</sup> at 25°C (Optiflo® M2600)
<b>Water Solubility</b>	Moderately soluble (notified polymer)
<b>Reactivity</b>	Stable under normal environmental conditions.
<b>Degradation Products</b>	Under extreme conditions, degradation products may comprise hydrocarbons, CO <sub>2</sub> and acrylonitrile.

### 7.4. Comments

At a concentration of 6% in water, the notified polymer forms a hazy, viscous solution similar to Optiflo® M2600. Viscosity increases with the concentration of the polymer such that 12% polymer in water without cosolvent is described as very thick but still flowable. A 14% polymer solution in water will still solvate but not flow and would not be amenable to filtration. The notified polymer displays similar water solubility characteristics to other nonionic, amorphous, noncrystalline associative thickeners. The cosolvents act to suppress the viscosity of the polymer in order to allow higher polymer concentrations in solution. Hence, polymer concentrations of up to 18-27% is achieved in the Optiflo® M2600 products.

## 8. ESTABLISHMENT OF LOW HUMAN HAZARD

### 8.1. Toxicology

No toxicological data were submitted.

## 8.2. Human Health Hazard Assessment

As no toxicological data were available for the notified polymer the polymer cannot be assessed against the NOHSC *Approved Criteria for Classifying Hazardous Substances*. Due to the high molecular weight and low reactivity of the polymer, the toxicological hazard of the polymer is expected to be low. The polymer is not expected to be hazardous by dermal exposure as the high molecular weight will preclude absorption through the skin.

The Material Safety Data Sheet (MSDS) for Optiflo® M2600 indicates that eye irritation may occur on exposure to the imported product, most likely due to the alkaline nature of the product (pH of 8 to 10). The glycol ether solvent is stated to potentially cause liver and kidney damage if swallowed or on repeated exposure. The residual monomer concentrations in the polymer are below the cutoff levels for classification of the polymer as a hazardous substance.

## 9. ENVIRONMENTAL HAZARDS

### 9.1. Ecotoxicology

No ecotoxicological data were submitted.

### 9.2. Environmental Hazard Assessment

This cannot be determined as no data has been provided. However, nonionic polymers of molecular weight greater than 1000 daltons are considered unlikely to cross biological membranes and therefore, the notified polymer is not considered to be of concern.

## 10. RISK ASSESSMENT

### 10.1. Environment

The majority of the notified polymer will be applied to various substrates and cured into a solid paint coating. The polymer will share the fate of these substrates, with eventual disposal to landfill or by incineration in accordance with State/Territory legislative requirements. Disposal to landfill in this form is unlikely to present a significant risk to the environment as the notified polymer will be contained in a solid matrix that is not expected to biodegrade or leach.

It is estimated that up to approximately 3% notified polymer will be released from the paint formulation site as spilled material, rinsate from equipment cleaning and residual material in containers. It is expected that the majority of this material would be released in the solid phase as sludge generated by licensed wastewater treatment plant at the paint formulation site, and to a lesser degree, at licensed container recycling facilities. A negligible proportion may be expected to be released to sewer from the said licensed wastewater treatment plants, which for the purpose of this assessment has been estimated to be 5% of the aforementioned release from the paint formulation site.

It is estimated that during application up to 5% notified polymer may be released as spilled material, overspray and residual material in containers. Another 5% may be released to sewer during cleaning of paint equipment.

Hence, the total loss of notified polymer that is likely to be disposed of via a licensed waste facility to landfill or incinerator is estimated to be up to 7.85% or 3.14 tonnes notified polymer per year. The greater proportion of this material derived from the application process is likely to be in the cured form and therefore, the notified polymer will be immobile within the cured paint matrix. The smaller proportion that may not be in the cured form, if it were in a landfill, should remain associated with the soil and sediment due to the high molecular weight of the notified polymer. Due to its water solubility, uncured polymer may prove mobile in a landfill to a degree. However, it is expected to biodegrade slowly to water, carbonate and nitrate or ammonia and is not expected to bioaccumulate or cross biological membranes, due to its high molecular weight (>1,000 daltons). In the event that waste material containing the notified polymer is incinerated, it is expected that the likely combustion products will be oxides of carbon and nitrogen.

The total loss of notified polymer to sewer from the paint formulation facility, container recyclers and cleaning of paint application equipment is estimated to be up to 5.15% or 2.06 tonnes notified polymer per year. Based on its use throughout Australia with discharges primarily to metropolitan sewerage systems, the Predicted Environmental Concentration (PEC) would be:

Amount released to sewer per annum:	2.06 tonnes
Population of Australia:	20.1 million
Volume of water/person/day:	200 L
PEC in sewer:	1.4 µg/L
Dilution factor in receiving water:	1:10
PEC in receiving water:	0.1 µg/L

Given that: polymer reformulation and application will not be concentrated in one area of Australia but is likely to be distributed widely; the concentration of the notified polymer in paints is low (<1% notified polymer); the estimated PEC in receiving waters will be low; and the notified polymer is of low concern to the aquatic environment due to its high molecular weight, it is considered that the potential releases of the polymer via sewer, landfill or incinerator will present a low risk to the environment.

### 10.2. Occupational health and safety

There is little potential for significant occupational exposure to the notified polymer in the transport and storage of the imported products or the finished paint products. There will be exposure during paint production and in the use and disposal of paints.

During the paint manufacturing process, the main exposure route for the notified polymer will be dermal. The paints will be viscous and ready formation of aerosols is not expected. The polymer is not expected to be hazardous by dermal exposure as the high molecular weight will preclude absorption through the skin. However, irritation may occur on dermal exposure to the imported products, Optiflo® M2600 and TX-2050, due to the alkaline nature of the products. Exposure to Optiflo® M2600 should also be avoided due to the potential health hazards associated with the glycol ether cosolvent. The engineering controls and use of personal protective equipment (impervious gloves, safety goggles or safety glasses with side shields and coveralls) will provide a high level of protection against the notified polymer. The MSDS indicate that the gloves should be composed of butyl rubber, nitrile rubber or neoprene. No significant occupational health and safety risks are expected when engineering controls and protective measures are implemented.

Occupational exposure during the sale and professional use of architectural paints is likely to be widespread and often under poorly controlled conditions. Dermal contact during handling and application of the paints is likely. The occupational health and safety risk associated with dermal contact with the notified polymer in the form of uncured paints will be low due to the low toxicological hazard of the notified polymer and the low concentration (<1%) of the notified polymer in the finished paint products.

### 10.3. Public health

While dermal and possibly eye contact with the notified polymer may occur during application of the paints containing the polymer by the public, based on its expected low toxicity and low concentration in final paint products, the notified polymer is expected to pose a low risk to public health when used in the proposed manner.

In dried paint films, the notified polymer will be encapsulated in an inert, very high molecular weight matrix, which will render it biologically unavailable, and consequently the risk to public health is considered to be low.

## 10. CONCLUSIONS – ASSESSMENT LEVEL OF CONCERN FOR THE ENVIRONMENT AND HUMANS

### 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

The notified polymer is of Low Concern to occupational health and safety under the conditions of the occupational settings described.

#### 10.3.2. Public health

There is Low Concern to public health when the finished paint products containing the notified polymer are used in the proper manner.

## 11. MATERIAL SAFETY DATA SHEET

### 11.1. Material Safety Data Sheet

The notifier has provided MSDS in accordance with the schedule item B 12 of the *ICNA Act*. The accuracy of the information on the MSDS remains the responsibility of the applicant.

## 12. RECOMMENDATIONS

### Control Measures

#### Occupational Health and Safety

Use the imported products and finished paints containing the notified polymer with adequate ventilation. The MSDS recommends that local exhaust ventilation be used when opening the imported product containers or when the products are transferred.

Protective eyewear, chemical resistant industrial clothing and footwear and impermeable gloves (composed of butyl rubber, nitrile rubber or neoprene) should be worn during occupational use of the imported products containing the notified polymer in concentrated form. Where engineering controls and work practices do not reduce vapour and particulate exposure to safe levels, an air fed respirator should also be used.

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

Spillage of the imported products and finished paints containing the notified polymer should be avoided. Spillages should be cleaned up promptly.

#### Disposal

The notified polymer should be disposed of in accordance with State/Territory and Commonwealth legislative requirements and applicable waste management guidelines.

Waste generated during industrial application of surface coatings containing the notified polymer should be disposed of through a licensed waste transporter to a licensed waste facility, such as a landfill or incinerator, in accordance with State/Territory and Commonwealth legislative requirements and applicable waste management guidelines.

### Emergency procedures

Large spills of the imported products should be contained by dyking, and pumped into resealable, labelled containers for recycling or disposal in accordance with State/Territory legislative requirements and applicable waste management guidelines. Soak up remainder with absorbent material. Small spills should be contained (e.g. by dyking) and absorbed with inert materials (e.g. sand, earth). Collect absorbed material into resealable, labelled containers for disposal in accordance with State/Territory legislative requirements and applicable waste management guidelines. Use caution to avoid slipping. Flush affected area with copious amounts of water but only if waters are collected for appropriate disposal in accordance with State/Territory legislative requirements. Keep spills and cleaning runoff out of municipal sewers, stormwater or open bodies of water.

### 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:

- (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.