

File No PLC/740

11 March 2008

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

**FULL PUBLIC REPORT**

**Polymer in E 440 W**

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, Water, Heritage and the Arts.

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****Polymer in E 440 W****1. APPLICANT AND NOTIFICATION DETAILS**

## APPLICANT(S)

BASF Australia Pty Ltd (ABN: 62 008 437 867)  
Koroit Creek Road  
ALTONA VIC 3018

## NOTIFICATION CATEGORY

Polymer of Low Concern

## 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.

## VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)

No variation to the schedule of data requirements is claimed.

**2. IDENTITY OF CHEMICAL**

## MARKETING NAME(S)

Polymer in E 440 W

## MOLECULAR WEIGHT (MW)

Number Average Molecular Weight (Mn) >1000 Da.

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.

**4. PHYSICAL AND CHEMICAL PROPERTIES**

Appearance at 20°C and 101.3 kPa: White to slightly yellow highly viscous liquid.

Melting Point 25-30°C (estimated)

Density 1062 kg/m<sup>3</sup> at 20°C

Water Solubility Likely to be insoluble in water due to the predominance of hydrophobic and slightly water soluble functional groups in its structure. The polymer is dispersible in water.

Dissociation Constant Contains anionic functionality and is likely to display typical acidity with a pKa of 4-5.

Reactivity	Contains groups that may undergo hydrolysis under extreme pH conditions. However, the notified polymer is considered 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	3 – 10	3 – 10	30 – 100	30 – 100	100 – 200

#### Use

The notified polymer will be used as a binder in paints and varnishes at <32%. The paints and varnishes containing the notified polymer will be applied to wood and metal substrates by professional tradesmen and domestic users.

#### Mode of Introduction and Disposal

The notified polymer will not be manufactured in Australia. The notified polymer will be imported in Intermediate Bulk Containers (IBCs) and steel drums.

#### Operation Description

The notified polymer will be transported by road to customer sites in Victoria and New South Wales for reformulation. The notified polymer will be poured from the import containers into an opened or closed blending vessel using a forklift. Alternatively, electronic or mechanical pumps may be employed to transfer the notified polymer from the import container to the blending vessel. Blending of the notified polymer with co-solvents, additives and pigments will be automated using dissolvers and continuous mixing pearl mills. The finished paints and coatings will be transferred into containers, drums and cans via automatic pumps. The notified polymer will be present in paints and coatings (at <32%).

The finished products containing the notified polymer will be applied by brush or roller and possibly spray. Once the paint or varnish has cured, the notified polymer will be immobilised in an inert cross-linked polymer matrix. The articles coated with the notified polymer will eventually be disposed of to landfill.

## 6. HUMAN HEALTH IMPLICATIONS

### Hazard Characterisation

No toxicological data were submitted. The notified polymer meets the PLC criteria and therefore is assumed to be of low hazard.

### Occupational Health and Safety Risk Assessment

#### Reformulation

Dermal and ocular exposure is also possible from drips, spills and splashes during these blending and mixing processes. Inhalation exposure to the notified polymer (at <42%) during pouring and blending processes in an open mixing vessel and during the use of continuous mixing pearl mills is not expected to be significant due to the low vapour pressure of the imported product containing the notified polymer. It is expected that exhaust ventilation will be used during reformulation to minimise inhalation and workers are expected to wear appropriate Personal Protective Equipment (PPE) including impervious gloves, safety glasses and coveralls to minimise dermal and ocular exposure.

#### Application by professional tradesmen

Professional tradesmen may experience inhalation, dermal and ocular exposure to paint and varnish products containing the notified polymer (at <32%) during spray, roller and brush application. However, exposure is expected to be minimised by the use of appropriate PPE including full-face mask, impervious gloves, safety glasses and coveralls.

After application and once dried, the paint containing the notified polymer will be cured into an inert matrix from which the notified polymer will be unavailable to cause exposure.

Although exposure to the notified polymer could occur during reformulation processes and application of coatings containing the notified polymer, the risk to workers is considered low due to its assumed low hazard.

### **Public Health Risk Assessment**

DIY users may experience dermal, inhalation and ocular exposure to the notified polymer (at <32%) during roller and brush and to a lesser extent, spray application of coatings. Exposure may be minimised by the use of PPE including gloves, safety glasses and coveralls.

After application and once dried, the paint containing the notified polymer will be cured into an inert matrix from which the notified polymer will be unavailable to cause exposure.

Although the DIY users will be exposed to paint and varnish products containing the notified polymer (at <32%) during spray, roller and brush application, the risk to public health is considered to be low due to its assumed low hazard.

## **7. ENVIRONMENTAL IMPLICATIONS**

### **Hazard Characterisation**

No ecotoxicological data were submitted. Polymers without significant ionic functionality are of low concern to the aquatic environment. The polymer has a high molecular weight (>1000 Da), is insoluble in water and is therefore unlikely to cross biological membranes.

### **Environmental Risk Assessment**

The notified polymer will be imported into Australia in IBCs and transported to paint formulators. During reformulation it is expected that 0.5% (< 1 tonne per annum) will remain as residue in the empty import containers and approximately 1% (< 2 tonnes per annum) will be lost from spills and cleaning of equipment during paint formulation. The residue in empty import containers is expected to be sent to drum re-conditioners and after being cross-linked with other polymers sent to landfill for disposal. Paint and varnish from cleaning of equipment and spills will be allowed to cure before being disposed of to landfill.

Once reformulated, the notified polymer will be present as a component of a waterborne paint or varnish, which will be applied to a wide range of substrates such as doors, windows, walls, etc consisting of wood, metal, stone and concrete, etc. The notifier indicates that this will be most likely be performed by roller and brush and estimates that approximately 65% (130 tonnes) of the notified polymer will be used in products for industrial use and 35% (70 tonnes) of the notified polymer will be used in products for domestic use. It is expected that industrial application will be performed by professional tradesmen, whilst domestic applications will be performed by both professional and DIY users. Although unlikely, the possibility remains for paints and varnishes to be applied by spraying. During spraying, waste from overspray may account for as much as 50% of the amount of paint applied. This is expected to be collected using newspaper etc. and disposed of to landfill. For domestic applications it is expected that approximately 50 mL from every application of 10 L ( $\equiv$  0.5% of 70 tonnes; < 350 kg per annum) of paint or varnish will be disposed of as waste from cleaning of equipment. Professional painters are likely to collect rinsings allow them to solidify and then dispose of the cured paint to landfill.

For industrial applications the waste from rinsings and cleaning of equipment is expected to be considerably less than for domestic applications. This is likely to account for 0.05% of the maximum of 130 tonnes per annum of the notified chemical (<65 kg per annum).

Empty paint cans are expected to contain 1% as residue. It is estimated that residue in used paint cans (containing between 1 and 15% residue) will account for approximately 5% of the domestic use of paint containing the notified polymer. The total amount of notified polymer in used paint cans is estimated as 1% of < 130 tonnes for industrial applications plus 5% of < 70 tonnes for domestic use, which is equal to ~ 5 tonnes per annum. Empty paint cans are expected to be disposed of at authorised waste facilities or landfill. The vast majority of the notified polymer will be used for its intended purpose and will share the same fate of the articles at the end of their useful lives. It is expected that the majority of these articles will eventually be landfilled, enter metal recycling or possibly be incinerated. In landfill the notified polymer is expected to be immobile and will eventually undergo *in-situ* degradation by abiotic and biotic processes to landfill gases including methane, ammonia, oxides of carbon and nitrogen, and water vapour. In metal recycling or incineration the polymer is expected to be combusted to oxides of carbon and nitrogen, and water vapour.

If a worst case scenario is considered, where the entire amount of waste waterborne paints and varnishes containing the notified polymer from domestic use generated from unused paint and equipment cleaning ( $\sim 5\% \times 70$  tonnes per annum; 3.5 tonnes per annum) is released to sewer, the predicted environmental concentration (PEC) may be calculated.

The model assumes release to sewer throughout Australia on a daily basis (to allow for industrial and domestic applications) and no adsorption of the polymer by sewage sludge.

PEC for the Aquatic Compartment		
Total Annual Import/Manufactured Volume	200000	kg/year
Proportion expected to be released to sewer	1.75%	
Annual quantity of chemical released to sewer	3500	kg/year
Days per year where release occurs	365	days/year
Daily chemical release:	9.6	kg/day
Removal within STP	0%	
Dilution Factor - River	1.0	
PEC at sewage outfall:	2.27	$\mu\text{g/L}$

No ecotoxicity data were provided and a Predicted No Effect Concentration (PNEC) and risk quotient ( $\text{RQ} = \text{PEC} \div \text{PNEC}$ ) cannot be calculated. However, the worst case PEC is low and polymers without significant ionic functionality are of low concern to the aquatic environment. Further, a more realistic value for the release of waste paint and varnishes to sewer would be of rinsings  $\sim 415$  kg per annum of notified polymer (from industrial and domestic applications), resulting in a PEC of  $0.27 \mu\text{g/L}$ . The risk to the environment is therefore expected to be low.

## 8. CONCLUSIONS AND RECOMMENDATIONS

### Human health risk assessment

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

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

### Environmental risk assessment

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

### 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.

- 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.

- Spray painting applications should be in accordance with the *National Guidance Material for Spray Painting* [NOHSC (1999)].

#### Disposal

- The notified polymer should be disposed of by authorised landfill or authorised waste paint collection depot.

#### Emergency procedures

- Spills and/or accidental release of the notified polymer should be handled by physical containment. Do not allow spill to enter drains, sewers or waterways. Adsorb spill with inert adsorbent (sand vermiculite, universal binder) and place in suitable containers for disposal.

### **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 polymer has changed from a binding agent in paints and varnishes, or is likely to change significantly;
  - the amount of polymer being introduced has increased from 200 tonnes, or is likely to increase, significantly;
  - if the polymer has begun to be manufactured in Australia;
  - additional information has become available to the person as to an adverse effect of the 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 MSDS of products containing 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.