

File No PLC/475

19 December 2005

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

FULL PUBLIC REPORT

Polymer in Hybridur 570/580

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**Director
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FULL PUBLIC REPORT**Polymer in Hybridur 570/580****1. APPLICANT AND NOTIFICATION DETAILS**

APPLICANT(S)

Swift and Company Ltd (ABN 44 000 005 578) of 372 Wellington Road Mulgrave VIC 3170

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, 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

Canada (1997)

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

Hybridur 570/580

3. COMPOSITION

PLC CRITERIA JUSTIFICATION

<i>Criterion</i>	<i>Criterion met (yes/no/not applicable)</i>
Molecular Weight Requirements	Yes
Functional Group Equivalent Weight (FGEW) Requirements	Not applicable
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. INTRODUCTION AND USE INFORMATION

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

The notified polymer will be imported as a liquid (< 35% notified polymer) in 20 kg and 220 kg cans.

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>
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<i>Tonnes</i>	10-30	10-30	10-30	10-30	10-30
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USE

An ingredient in adhesives, binders and coaters.

5. PROCESS AND RELEASE INFORMATION**5.1. Operation Description**

The notified polymer will not be manufactured in Australia but will be imported as a component of Hybridur 570/580 Dispersion for use in formulation of clear and pigmented industrial surface coatings.

At formulation areas, the product will be weighed and manually added to a mixing vessel with other ingredients and mechanically mixed under local exhaust ventilation. The resulting dispersions (containing < 35% notified polymer) will be pumped to an automated filling unit for packaging into containers. The QC technician will perform testing and adjustment to the formulation if necessary.

At the application site, the coating is transferred to an appropriate container for application, such as a roller pan, or spray paint reservoir. Alternatively, the coating is applied directly from the original container as in brush application. The personal protective equipment will typically include suitable gloves, goggles, and aprons. Protective suits and respirators may be worn for certain spray applications. In addition, the application area must be equipped with adequate ventilation.

The mixing and application equipment will be cleaned. Cleaning solution is disposed of in accord with the MSDS and government regulations. Unused paint is either disposed or saved for later use.

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.

Inhalation, dermal contact and some ocular exposure due to splashes and spillages can occur during certain formulation processes, equipment cleaning and spray paint applications. However, exposure to significant amounts of the notified polymer is limited because of the engineering controls and personal protective equipment worn by workers.

All loading, unloading and handling of the polymer dispersions within the formulation facility are expected to be performed by well-trained staff. Industrial hygiene programs are implemented which include the provision and routine use of personal protective equipment (eg safety goggles, safety boots, chemically resistant gloves, aprons, or other impervious clothing, and respiratory protection), and hazard communication programs designed to inform workers about the identity and potential hazards (if any) of chemicals used in their respective work areas. Periodic workplace inspections are also carried out to ensure that all safety procedures are in place and that employee exposures are below acceptable thresholds.

In the case of industrial spray painters, they will wear appropriate respiratory protection, goggles, impermeable gloves and overalls to minimise exposure in accordance with the MSDS. Appropriate engineering controls will also be in place.

6.2. Summary of Public Exposure

The coating containing the notified polymer is intended for use in industry only. The public may come into contact with the finished cured surfaces however in this form the notified polymer is bound in an inert matrix and hence not biologically active.

The only other potential health exposure would arise from a spill during the transport of the product. This would be dealt with by the containment and clean up procedures recommended in the MSDS.

6.3. Summary of Environmental Exposure

6.3.1. Environmental Release

Since the notified polymer is manufactured overseas there will be no release in Australia due to manufacture. Until it reaches the paint manufacturing site, release to the environment during shipping, transport and warehousing will only occur through accidental spills or leaks.

The polymer will be blended with coating raw materials to produce surface coatings used to paint a variety of surfaces. Residual coatings remaining in the mixing container is washed out, accounting for approximately 2% of the notified polymer. The finished coatings are used by industrial coating operations. The surface coating manufacturers and industrial painting operations have their own waste capture and will be disposed off in the same manner as their current trade waste. It is assumed that 5% will be captured and be landfilled. It is likely that the coatings would be applied through spraying, rollers and paint brushes. For spray, it is assumed that 20% overspray to landfill and that 5% of the brush and roller use mainly by handyman will be released to the sewer through washing of painting equipment.

It is expected that after use the empty containers will only contain hang up on the sides and rim of the can and the surface coating will have solidified into a surface film. It is expected that there would only be 1-2% of the product in the container. Empty containers would be disposed of to landfill in domestic recycling programs.

Hence the maximum total amount of the notified polymer released during use would correspond to about 7% discharged to sewer and 21% disposed of to landfill.

After application to surfaces and once dried, the coating containing the notified polymer is cured into an inert matrix and is hence unavailable for exposure.

6.3.2. Environmental Fate

The notified polymer's high molecular weight suggests that it is unlikely to cross biological membranes and bioaccumulate.

Although the disposal quantity of the notified polymer is relatively large, the waste will be disposed of in landfill in a dispersed manner and in solid form. Waste water containing the notified polymer from cleaning of the application/manufacture equipment is treated at the waste treatment plant. Given the notified polymer's hydrophobic nature, its removal from the wastewater stream is expected to be high. In landfill, solid wastes containing the polymer will be immobile and not leach into the aquatic compartment, but should slowly degrade and become associated with the soil matrix. Although the notified polymer contains hydrolysable groups, hydrolysis will not occur under environmental pH range due to low water solubility

7. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa	Flexible plastic
Melting Point/Glass Transition Temp	The polymer will never become a true liquid. Glass transition = -20°C
Density	1030 kg/m ³ at 21°C (40% polymer dispersion)
Water Solubility	Dispersible in water
Dissociation Constant	Not determined, the notified polymer contains acidic functional groups which are expected to display typical acidity
Reactivity	Stable under normal environmental conditions
Degradation Products	None under normal conditions of use

8. HUMAN HEALTH IMPLICATIONS

8.1. Toxicology

There were no toxicity data available for the notified polymer. The following toxicological end-points in relation to a structural analogue of the notified polymer were submitted.

<i>Endpoint</i>	<i>Result</i>	<i>Classified?</i>	<i>Effects Observed?</i>
Rat, acute oral LD50 >5000 mg/kg bw	low toxicity	no	yes
Rat, acute dermal LD50 >2000 mg/kg bw	low toxicity	no	yes
Rabbit, eye irritation	slightly irritating	no	yes
Guinea pig, skin sensitisation – non-adjuvant test.	no evidence of sensitisation	no	no

8.1.1. Discussion of observed effects

OECD TG 401 Acute Oral Toxicity:

All animals survived the 5000 mg/kg oral dose in good health. No abnormal physical signs were noted. Body weight changes were normal in 9/10 animals. One female lost weight during the second week of the observation period. Necropsy results were normal.

OECD TG 402 Acute Dermal Toxicity:

All animals survived the 2000 mg/kg dermal application. One instance of yellow nasal discharge was noted during the observation period. Dermal reactions, well defined to moderate at 24 hours, were absent to severe on day 7 and absent to well defined on day 14. Body weight changes were normal. Necropsy results were normal in 3/10 animals. Treated skin abnormalities were noted in seven animals.

OECD TG 405 Acute Eye Irritation/Corrosion:

There was no corneal opacity noted at any observation period. Iritis, noted in 1/3 eyes, cleared by 24 hours. Conjunctival irritation, noted in 3/3 eyes, cleared by 48 hours. There were no abnormal physical signs noted.

TSCA Protocol No. 112B-03 (similar to OECD TG 406 Skin Sensitisation):

Erythema was absent to faint during the induction phase, and was absent during the challenge in the induced and uninduced animals. The test substance was used as received. All animals appeared normal during the observation period. Body weight changes were normal.

8.2. Human Health Hazard Assessment

The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard. However, dermal reactions were noted in the acute dermal study with a polymer analogue indicating a potential for skin irritation.

9. ENVIRONMENTAL HAZARDS**9.1. Ecotoxicology**

No ecotoxicological data were submitted.

9.2. Environmental Hazard Assessment

No ecotoxicity data were provided for the notified polymer. Anionic polymers are known to be moderately toxic to algae. The mode of toxic action is overchelation of nutrient elements needed by algae for growth. The highest toxicity is when the acid functionalities are on alternating carbons of the polymer backbone. This is not likely to apply to the notified polymer. Furthermore, the toxicity to algae is likely to be further reduced due to the presence of calcium ions, which will bind to the functional groups.

10. RISK ASSESSMENT

10.1. Environment

Waste polymer from reformulation into coatings or residues in containers (either polymer transport drums or paint tins) will be disposed of to landfill as an inert solid. A small amount of polymer may be incinerated as part of the drum reconditioning process. Incineration of the polymer would destroy the material with the production of water vapour, and oxides of carbon and nitrogen.

Waste from the washing of application equipment will be washed down the drain where it will be removed as part of the sewage treatment process and buried in landfill.

The majority of the waste is likely to be generated through overspray during industrial applications, where up to 20% of paint could be lost, depending on the type of spray equipment used. However, in most industrial situations, it is expected that spray application will occur in spray booths, in which engineering controls, such as filters systems, are used to trap the overspray. The cured trapped wastes arising from industrial application are expected to be periodically removed and disposed of into landfill through a licensed waste contractor.

In a worst case based on maximum annual imports of 30 tonne per annum, 5% of which is released to sewer through washing of brushes and assuming that none is removed during sewage treatment processes, assuming a national population of 20,100,000 and that each person contributes an average 200 L/day to overall sewage flows, the predicted concentration for release to ocean and river on a nationwide basis are 0.007 and 0.07 µg/L, respectively.

million	Amount of entering sewer annually	1500 kg
	Population of Australia	20.1
	Amount of water used per person per day	200 L
	Number of days in a year	365
	Estimated PEC _{Ocean}	
	0.1 µg/L	
	Estimated PEC _{River}	
	1.0 µg/L	

The above PEC is likely to be reduced through removal of the polymer during sewage treatment. The low level of exposure of the polymer to the aquatic compartment indicates that the polymer is unlikely to have an adverse effect on aquatic organisms.

The majority of the notified polymer will be applied to surfaces and either share the fate of the surface at the end of its useful life (most likely to landfill) or be removed by sanding. If removed by sanding the coating containing the notified polymer will be broken up into solid particulate matter and most likely disposed to landfill.

10.2. Occupational Health and Safety

The OHS risk presented by the notified polymer is expected to be low, given the automated process and engineering controls implemented at the formulation and application sites, the industrial hygiene, the good work practices and safety measures including use of appropriate personal protective equipment by workers. Moreover, the notified polymer will be used at industrial facilities where operatives are familiar in using such products and good handling procedures and housekeeping are the norm.

The notified polymer may be present in formulations containing hazardous ingredients. If these formulations 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.

10.3. Public Health

The dispersions of the notified polymer are intended for use by professional painters in the surface coating industry and will not be sold to the public. Following application, the notified

polymer will be trapped within a coating and will not be bioavailable. Therefore, the risk to public health from exposure to the notified polymer is considered low.

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

11.1. Environmental Risk Assessment

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

11.2. Human Health Risk Assessment

11.2.1. Occupational health and safety

There is Low Concern to occupational health and safety under the conditions of the occupational settings described.

11.2.2. Public health

There is Negligible Concern to public health when used in the proposed manner.

12. MATERIAL SAFETY DATA SHEET

12.1. Material Safety Data Sheet

The notifier has provided MSDS as part of the notification statement. The accuracy of the information on the MSDS remains the responsibility of the applicant.

13. 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.
- In the interest of occupational health and safety, the following guidelines and precautions should be observed for use of the notified polymer as a component of paint products:
 - Adequate training for staff in handling paint products, including training of industrial spray painters with respect to the NOHSC *National Guidance Material for Spray Painting*;
 - Implementation of general health surveillance and monitoring programs as required.
- 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.

Disposal

- The notified polymer should be disposed of by incineration or to landfill.

Emergency procedures

- Spills/release of the notified polymer should be contained by absorbent material (eg sand), manually collected (along with absorbent material) and placed in a sealable, labelled container for disposal to landfill.

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:

- (1) Under subsection 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 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.