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

FULL PUBLIC REPORT

Photomer 5930F

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**Director
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Photomer 5930F

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)

Cognis Australia Pty Ltd (ABN 87 006 374 456) of 4 Saligna Drive, Tullamarine, VIC, 3043.

and

BASF Coatings Pty Ltd (ABN 93 080 438 464) of 231-233 Newton Road Wetherill Park, NSW, 2164.

NOTIFICATION CATEGORY

Limited: Polymer with NAMW ≥ 1000

EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication:

Chemical Identity

Molecular weight

Polymer Constituents

Spectral Data

Purity and Identity of impurities

Introduction volume

Details of use

Identity of recipients

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)

Variation to the schedule of data requirements is claimed for physicochemical data.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

CEC/692

NOTIFICATION IN OTHER COUNTRIES

USA

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

Photomer 5930F

Polyetheracrylate in Radiation Curable Coating Mat

METHODS OF DETECTION AND DETERMINATION

METHOD	Elemental analysis and Infrared Spectroscopy
Remarks	Reference data and spectra provided
TEST FACILITY	Bayer (2006)

3. COMPOSITION

DEGREE OF PURITY

> 50%

HAZARDOUS IMPURITIES/RESIDUAL MONOMERS

The notified polymer contains ~ 40% of an impurity with irritant and potentially sensitisation effects.

DEGRADATION PRODUCTS

None identified. The notified polymer is expected to be stable under normal conditions of use.

LOSS OF MONOMERS, OTHER REACTANTS, ADDITIVES, IMPURITIES

The main impurity is of low volatility and as such loss during use is not expected. All other residual monomers and additives are present in low concentrations.

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. The notified polymer will be introduced in a ready to use surface coating at a concentration of 25-50%.

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>	< 10	< 10	< 10	< 10	< 10

USE

The notified polymer is a component of a radiation cured surface coating.

5. PROCESS AND RELEASE INFORMATION

5.1. Distribution, transport and storage

PORT OF ENTRY

Initially Sydney and in future years, possibly other major Australian ports.

IDENTITY OF RECIPIENTS

The notified polymer may be stored by BASF Coatings Pty Ltd prior to distribution to customer sites. At present one site in NSW has been identified.

TRANSPORTATION AND PACKAGING

The surface coating containing the notified polymer will be imported by sea in 200 L closed head steel drums. Transport from wharf in NSW will be by road to the customers' warehouse.

5.2. Operation description

No manufacture, reformulation or repacking is expected to take place in Australia.

Imported drums will be taken from the warehouse and the bung removed at the application point on the coating line. A dip-tube will be introduced and the coating pumped transferred as required into the feed tank of the application head. The coating will be applied by an automatic roller coating system as part of an in-line coating system and cured/hardened within an enclosed UV Curer immediately after application. The coated substrate is collected at the end of the coating line and QC checked following which it is transferred to finished goods warehouse awaiting testing for evaluation.

The imported coating may be subject to QC analysis.

After emptying, the drums that contained coating containing the notified photomer would be rinsed with process fluid into the coating-line vessel as part of the batch charge. Rinsed and drained drums are expected to be sent to a drum recycler.

It is expected that the application line equipment and filling lines will be cleaned after the end of the campaign for a given range of common-base products by flushing the system with process fluid. It is expected that rinsings will be recycled into the first batch of the next campaign.

5.3. Occupational exposure

Number and Category of Workers

<i>Category of Worker</i>	<i>Number</i>	<i>Exposure Duration</i>	<i>Exposure Frequency</i>
Transport	1	none	
Warehouse	2	0.5 – 1.0	24
Coating line operator	9 (3X3 shifts)	0.75	24
Laboratory	1	0.5	24

Exposure Details

During transport and warehousing, workers are unlikely to be exposed to the imported product containing the notified polymer (up to 25-50% notified polymer) except when packaging is accidentally breached. Dockside and warehouse workers routinely wear cotton overalls and steel-capped boots.

Coating line operators have the potential for exposure to the notified polymer at a concentration of 25-50% when transferring the surface coating to the feed tank of the application head. Dermal exposure to drips and spills and contact with the dip-pipe is the most likely route of exposure although accidental ocular exposure to splashes cannot be ruled out. The coating operation is fully automated and enclosed and as such exposure to the notified polymer during this process is not expected. Once the coating surface has been cured, the polymer is bound within an inert matrix and therefore will be unavailable for exposure.

There is also the potential for dermal exposure by contact with contaminated surfaces for workers involved in the cleaning of drums and application equipment.

Coating line operators are expected to wear effective personal protective equipment (PPE) to ensure skin and eye contamination is avoided while the transfer of coating liquid to the coating line is carried out and for the cleansing and disposal of empty drums

There is potential for dermal and accidental ocular exposure to the notified polymer at a concentration of 25-50% during sampling and testing of the imported surface coating formulation. Workers are expected to be provided with appropriate PPE.

5.4. Release

RELEASE OF CHEMICAL AT SITE

There is no reformulation or manufacture of the notified polymer in Australia.

RELEASE OF CHEMICAL FROM USE

The notified polymer is to be used at a specific site, with no significant losses to any compartment of the environment expected. The coating line is automated and is an enclosed system so that no losses are likely. The notified polymer is of relatively high molecular weight (MW) and would be expected to have a low vapour pressure. In addition, coating/s in which the notified polymer will be present, will be free of solvent, therefore, no notified polymer can be carried away by volatilising solvent. The drums in which the coating is imported will be thoroughly drained and rinsed with a process fluid that is added to the coating to be applied. The rinsed drums will be substantially free of the notified polymer and are expected to be sent to a drum recycling facility. Assuming that 1% of the notified polymer residue remains in the empty drums before rinsing and of that 1% remains after rinsing then 0.01% (up to 1 kg) per year of the total import quantity will remain as residue in the empty drums.

There may be a potential for release of the polymer during steps to transfer the coating liquid from drums to the coating line vessel. The transfer is a simple process as described in 5.2 above. Release to the atmosphere will be negligible. Release to waterways or drains will not occur during operations. Fluid used for cleaning operations is expected to be reserved for charging to the first batch of the next campaign. It is expected any significant spillage, if it occurred, will either be salvaged for use or absorbed in dry absorbent and disposed of using a licensed contractor after negotiation with the

respective EPA. It is expected that less than 5 kg per year (of the polymer) could be waste as a result of spill or leak, including during local transport. Direct release to soil will not occur. There will be no release that may reach sewage treatment plants.

During curing the notified polymer is converted to form part of the cured polymer film as part of a solid article. There is only expected to be a small residual amount of the notified polymer in the cured film, and this will be integrally bound in the film and not available for release.

5.5. Disposal

As noted above, drum residues after rinsing will contain only traces of notified polymer and will be sent to drum recycling facilities. Unrecoverable spilled or leaked coating would be absorbed in inert absorbent. Disposal of the used absorbent will be negotiated with the local waste management authority.

5.6. Public exposure

The surface coating containing the notified polymer is supplied for industrial use only. The public may make contact with coated articles, however, once the coatings are cured, the notified polymer is no longer bioavailable.

6. PHYSICAL AND CHEMICAL PROPERTIES

The notified polymer is manufactured with an excess of one polymer constituent. Limited physicochemical data has been provided for the notified polymer at a purity of ~50%. The presence of this unreacted starting material is expected to affect these properties. Modelled data has also been provided for one polymer species with a MW ~ 1400.

Appearance at 20°C and 101.3 kPa		Colourless liquid (notified polymer ~50% purity)
Melting Point/Freezing Point		349.84 °C (modelled data)
Remarks	Determined using MPBPWIN v1.41 (Mean or Weighted MP)	
Boiling Point		1277.42 °C (modelled data)
Remarks	Determined using MPBPWIN v1.41 (Adapted Stein & Brown)	
Density		1130 kg/m ³ at 25°C (notified polymer ~50% purity)
METHOD	ISO 2811-3 Paints and varnishes - Determination of density - Part 3: Oscillation method	
Remarks	Density tested in duplicate.	
TEST FACILITY	Cognis (2005a)	
Vapour Pressure		1x10 ⁻⁴² kPa at 25°C (modelled)
Remarks	Determined using MPBPWIN v1.41 (Modified Grain method)	
Water Solubility		2.69 g/L at 20°C (notified polymer ~50% purity)
METHOD	In house based on OECD TG106 Flask Method	
Remarks	The total carbon content of the aqueous extract was analysed and the water solubility then calculated based on the % carbon content of the polymer.	
TEST FACILITY	Bayer (2006a)	
Hydrolysis as a Function of pH		Not Tested
METHOD	Determined using Hydrowin v 1.67	

<i>pH</i>	<i>T °C</i>	<i>t</i> _{1/2} <i>days</i>
7	25	104
>8	25	10.4

Partition Coefficient (n-octanol/water) log Pow = 3.3 at 25°C

METHOD	OECD TG 117 Partition Coefficient (n-octanol/water).
Remarks	HPLC Method. The column temperature was 40°C. The log Pow value for all peaks ranged from 0 – 6 greater than range for six reference substances. The log Pow value for the compound relates to the largest peak.
TEST FACILITY	Bayer (2006b)

Adsorption/Desorption log K_{oc} = 10.525 (modelled)
– screening test

METHOD	Not Tested. PCKOCWIN v 1.66. The value should be treated with caution due to water solubility and partition co-efficient results.
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Dissociation Constant Not determined

Remarks	The notified polymer is expected to be cationic in the environmental pH range (4-9)
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Particle Size Not determined

Remarks	The notified polymer at the purity introduced is a liquid.
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Flash Point > 100 °C (notified polymer ~ 50% purity)

METHOD	ASTM D93 – Pensky Marten Closed cup
Remarks	The sample polymerised at a temperature above 100 °C without reaching its flash point.
TEST FACILITY	Cognis (2005b)

Flammability Limits Not determined

Remarks	Based on the flash point the notified chemical is not classified as flammable according to the Australian Dangerous Goods classification (FORS, 1998)
TEST FACILITY	

Autoignition Temperature Not determined

Remarks	In a flash point study the sample polymerised above 100 °C, therefore, it is expected that an autoignition temperature could not be measured.
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Explosive Properties Not determined

Remarks	There are no chemical groups that would infer explosive properties. Hence the result has been predicted negative by expert determination.
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Stability Testing

Remarks	Differential Scanning Calorimetry (DSC) has been performed on the notified polymer (~50% purity). A small exotherm commences at approximately 150 °C with decomposition beginning at approximately 230 °C and a decomposition peak at 300 °C.
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Reactivity

Remarks	Expected to be thermally stable under normal conditions of use. Can polymerise if the shelf life or storage temperature are greatly exceeded. Reacts with peroxides and other radical components. The imported product contains stabilisers against spontaneous polymerisation.
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7. TOXICOLOGICAL INVESTIGATIONS

No toxicity data were submitted

8. ENVIRONMENT

8.1. Environmental fate

No environmental fate data were provided. The notified polymer is water soluble and of high NAMW and therefore is unlikely to bioaccumulate.

8.2. Ecotoxicological investigations

No ecotoxicological investigations were provided. The polymer has some cationic functionality. Low molecular weight polycationic polymers have been shown to be very highly toxic to aquatic organisms (Boethling and Nabholz 1997).

9. RISK ASSESSMENT

9.1. Environment

9.1.1. Environment – exposure assessment

The notified polymer is used at a single site and is cured to form a solid film of an article. There is only expected to be a small residual amount of the notified polymer in the cured film, and this will be integrally bound in the film and not available for release. Products containing residual amounts of the notified polymer are likely to be disposed of to landfill at the end of their useful lives, where the chemical will undergo in-situ degradation by abiotic and biotic processes.

The only release of the polymer is expected from residues from empty drums after rinsing and minor spills. The total release from these sources is expected to be up to 6 kg. This will be handled by licensed drum recyclers or other licensed contractor. If the notified polymer is incinerated at these facilities it will be combusted to form oxides of carbon and nitrogen; and water vapour.

9.1.2. Environment – effects assessment

The polymer has some cationic functionality. Low molecular weight polycationic polymers have been shown to be very highly toxic to aquatic organisms (Boethling and Nabholz 1997)

9.1.3. Environment – risk characterisation

A risk quotient (RQ) cannot be calculated as neither a Predicted Environmental Concentration nor a Predicted No Effect Concentration has been established. However, as the release of the polymer to the environment is expected to be minimal with no release to the aquatic environment, the RQ is expected to be minimal. Based on the expected usage pattern the notified polymer is not expected to pose an unacceptable risk to the environment.

9.2. Human health

9.2.1. Occupational health and safety – exposure assessment

Transport and warehouse worker exposure to the notified polymer is expected to be negligible except in the event of an accident..

Worker exposure during coating application is expected to be limited given the largely automated and enclosed nature of this process and the relatively low frequency and duration of exposure. The greatest potential for exposure to the notified polymer at a concentration of 25-50% is during transfer of the surface coating to the feed tank of the application. Dermal exposure to drips and spills and contact with the dip-pipe is the most likely route of exposure although accidental ocular exposure to splashes cannot be ruled out. Inhalation exposure is not expected to be a route of exposure given the predicted low vapour pressure of the notified polymer and the mode and method of application. The notified polymer is introduced in a coating that contains an ingredient that is classified as a skin sensitiser. Measures taken to limit exposure to this ingredient such as use of PPE would also limit exposure to the notified polymer.

Worker exposure could also occur during the cleaning of drums and application equipment and quality control sampling and analysis. Exposure is again expected to be limited by the use of PPE.

9.2.2. Public health – exposure assessment

The public is not expected to make any direct contact with the notified polymer. Although the public may make contact with coated articles, once the coatings are cured, the notified polymer is no longer bioavailable and therefore public exposure is expected to be negligible.

9.2.3. Human health – effects assessment

No toxicological data was available and hence the notified polymer cannot be classified as a hazardous substance in accordance with the NOHSC *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

The notifier has classified the product in which the polymer is found as a skin, eye and respiratory irritant based on the characteristics of similar polymers and the potential effects of the impurity present at ~40%.

The notified polymer, as well as the impurity, contains a structural alert for skin sensitisation. The sensitisation hazard is likely to be limited due to the high molecular weight (MW > 1000), and therefore low skin permeability, of the notified polymer. However sensitisation effects of the product in which the polymer is found cannot be ruled out due to the presence of the low molecular weight species and impurity (MW < 1000).

9.2.4. Occupational health and safety – risk characterisation

Based on the limited worker exposure, the risk to occupational health and safety is expected to be low. However, the notified polymer is expected to have some irritancy effects, and skin sensitisation effects could not be ruled out. Where dermal or ocular exposure to the notified polymer is possible, personal protective equipment (protective clothing, impervious gloves and safety glasses) would limit the risk of irritant/sensitisation effects. The risk of respiratory effects is considered to be low as inhalation exposure is not expected to be a route of exposure.

9.2.5. Public health – risk characterisation

Negligible public exposure is expected and hence the risk to the public is considered to be negligible.

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

10.1. Hazard classification

No toxicological data was available and hence the notified polymer cannot be classified as a hazardous substance in accordance with the NOHSC *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

The notifier has classified the product in which the polymer is found as a skin, eye and respiratory irritant (R36/37/38) based on the characteristics of similar polymers and the potential effects of the impurity present at ~40%.

10.2. Environmental risk assessment

The chemical 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

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

10.3.2. Public health

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

11. MATERIAL SAFETY DATA SHEET

11.1. Material Safety Data Sheet

The MSDS of the notified polymer and products containing the notified polymer provided by the

notifier were in accordance with the NOHSC *National Code of Practice for the Preparation of Material Safety Data Sheets* (NOHSC 2003). It is published here as a matter of public record. The accuracy of the information on the MSDS remains the responsibility of the applicant.

11.2. Label

The label for the notified chemical provided by the notifier was in accordance with the NOHSC *National Code of Practice for the Labelling of Workplace Substances* (NOHSC 1994). The accuracy of the information on the label remains the responsibility of the applicant.

12. RECOMMENDATIONS

CONTROL MEASURES

Occupational Health and Safety

- Employers should implement the following safe work practices to minimise occupational exposure during handling of the notified chemical as introduced:
 - Avoid skin and eye contact
- Employers should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified chemical as introduced:
 - Chemical resistant gloves
 - Protective clothing
 - Safety goggles

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 chemical 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 chemical should be disposed of by licensed contractor.

Emergency procedures

- Spills or accidental release of the notified chemical should be handled by physical containment with reuse of the polymer to the extent practicable. Any residue should be absorbed with dry inert material (sand vermiculite etc.) and placed into suitable containers for disposal.
- Prevent product from entering drains.

12.1. 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 Section 64(1) of the Act; if
 - the polymer has a number-average molecular weight of less than 1000or
- (2) 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.

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