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

**FULL PUBLIC REPORT**

**Polymer in Witcoflex 974**

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**Director  
Chemicals Notification and Assessment**

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## **FULL PUBLIC REPORT**

### **Polymer in Witcoflex 974**

#### **1. APPLICANT**

Crompton Specialties Pty Ltd (ABN 18 005 225 507) of Unit 2/13 Stanton Road Seven Hills NSW 2147 has submitted a notification statement in support of their application for an assessment certificate for the synthetic polymer of low concern (PLC), Polymer in Witcoflex 974.

#### **Notification in Other Countries:**

Canada 1991.

#### **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:**

Polymer in Witcoflex 974 (45% notified polymer in butanone)

#### **3. POLYMER COMPOSITION AND PURITY**

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

#### **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	The imported product containing 45% notified polymer in butanone is a clear viscous liquid.
<b>Melting point</b>	180°C	Test report not provided.
<b>Density</b>	1.15 kg/m <sup>3</sup>	Test report not provided.
<b>Water solubility</b>	Not determined	The notifier indicates that the polymer is not soluble in water. This is consistent with the hydrophobic structure of the polymer, although the high proportion of one monomer would impart some solubility. Also, it appears that its use would require a low water solubility..
<b>Hydrolysis as a function of pH</b>	Not determined	The notified polymer is not expected to hydrolyse under the environmental pH range of 4-9.
<b>Partition coefficient (n-octanol/water)</b>	Not determined	Given its low water solubility, the polymer is expected to partition into the octanol phase.
<b>Adsorption/desorption</b>	Not determined	Given its low water solubility, the polymer is expected to associate with soils and sediments.
<b>Dissociation constant</b>	Not determined	The polymer does not contain any groups which can undergo dissociation.
<b>Particle size</b>	Not applicable	The notified polymer is supplied as a 45%

<b>Flammability</b>	Not flammable	solids content in butanone. Test report not provided. Butanone solvent is highly flammable.
<b>Autoignition temperature</b>	Not determined	Butanone solvent ignites at -515°C.
<b>Explosive properties</b>	Not applicable	
<b>Stability/reactivity</b>	Stable	The polymer is relatively un-reactive.

## 6. USE, VOLUME AND FORMULATION

### Use:

A component of a waterproof, breathable coating agent applied on fabrics such as ski and camping garments.

### Import volume and duration:

1-10 tonners per year in the first five years.

### Formulation details:

Witcoflex 794 containing 45% notified polymer in butanone will be imported in 205 L steel drums for use in formulation of a fabric waterproof coating agent. The final concentration of the notified polymer in the coating mixture is between 9%-31.5%.

## 7. OCCUPATIONAL EXPOSURE

### Number and Category of Workers

<i>Category of Worker</i>	<i>Number</i>	<i>Exposure Duration</i>	<i>Exposure Frequency</i>
Transport and storage workers	6-8	--	--
R&D and QC (laboratory) staff	Not stated	1 h	30 days/year
Formulation operators	4-6	8 h	30 days/year
Coating applicators	4-6	8 h	30 days/year

### Exposure Details

The imported product will be shipped in 205 L steel drums directly from the docks to Crompton Specialties warehouse in St Marys NSW for storage. It will be then sent to a customer site in VIC for use in the formulation of a fabric coating agent. Transport and storage workers will wear overalls and safety shoes. They would only be exposed to the notified polymer in the event of an accident. Spills will also be absorbed with vermiculite, dry sand or earth and disposed of in accordance with regulations.

Laboratory staff will be involved in preparation and testing of trial batches of blend. This involves mixing the notified polymer solution with other components in laboratory mixers and sampling the ingredients and final formulation. They will wear laboratory coats, protective gloves and safety glasses.

Formulation operators will weigh out and pour the polymer solution and other ingredients into 500 kg steel enclosed mixing vats using a forklift. After mixing, the blend will be transferred via transfer lines to a blend holding tank which then will be used to feed coating machines.

Coating applicators will be involved in operation of the coating machine consisting of rollers saturated with the blend. The garments will pass through the rollers and excess blend will be removed from the fabrics by a doctor blade. The treated garments will be dried in an oven allowing the butanone solvent to evaporate.

Potential exposure of these workers would be predominantly via inhalation (solvent vapour), ocular exposure and skin contact. Formulation and coating workers will wear respiratory protection, chemical goggles/face shields to prevent eye contact, and impermeable gloves and protective overalls to prevent skin contact. All work areas will be fitted with local and general ventilation. Taking all into

consideration, worker exposure to the notified polymer is determined to be low under the proposed occupational conditions.

## **8. PUBLIC EXPOSURE**

Public exposure to the notified polymer may occur as a result of rupture of the container in a transport accident. In the event of a spill, the MSDS advises that potential ignition sources should be removed, the material be contained and collected by absorption and disposed of in accordance with regulations. Public exposure thus will be negligible during importation and transportation.

Formulation of the product into a blend mix for use in fabric coating will occur in Australia. However, the public will not be exposed to the blend. Significant public exposure will be through dermal contact with treated fabrics, but once the fabric is dried the polymer is irreversibly bound to the fibres and is not bioavailable.

Residues in drums (<1%) will be air dried and disposed of in landfill. Waste liquid from application process will be collected and later disposed of by licensed disposal contractors. Hence, public exposure through waste is considered negligible.

## **9. ENVIRONMENTAL EXPOSURE**

### **9.1. Release**

The notifier estimates that approximately 2 kg of the polymer could remain as residue in empty import drums after decanting into the mixing vats. Polymer residue thus can be as high as 1% or 100 kg per annum. The drums will be disposed of in landfill.

Up to 2% of the notified polymer may be disposed of in landfill as a result of spills during formulation and application of the waterproofing agent. This equates to a release of up to 200 kg per annum. A further 2%, or 200 kg per annum, may be disposed of in landfill following cleaning of mixing vessels and transfer lines.

The majority of the notified polymer will be stabilised in the fabric by virtue of the formation of its three-dimensional structure in the matrix of the fabric, and not be released directly to the environment. The use of fabric treated with the notified polymer would be subject to 'wear and tear' during outdoor activities. Leaching of the polymer from treated fabrics is not expected to be significant because of the low water solubility of the notified polymer and its considerable affinity for textile surfaces. In addition, such release would be quite diffuse. At the end of their useful lives garments coated in the waterproof formulation will be disposed of in landfill where the notified polymer may be released as the fabric degrades.

### **9.2. Fate**

The majority of the notified polymer will be bound to the fabric acting as a waterproofing agent for fabrics used for garments for outdoor activities and remain in this form until these articles are disposed of and the fabric degrades. Up to 400 kg per annum of the notified polymer may be disposed of in landfill during the formulation and application processes. In landfill the polymer would be expected to associate with soils and sediments and not leach into the water compartment given its predicted low solubility in water. The polymer is likely to be degraded very slowly through abiotic and then biotic processes.

The notified polymer is not expected to bioaccumulate due to its high molecular weight (Connell, 1990).

## **10. EVALUATION OF HEALTH EFFECTS DATA**

No toxicological data were submitted.

## **11. EVALUATION OF ENVIRONMENTAL EFFECTS DATA**

No ecotoxicological data were provided.

## **12. ENVIRONMENTAL RISK ASSESSMENT**

The notified polymer is not likely to represent a risk to the environment when it is used in the proposed manner, ie as a component of a waterproof coating for garments used in outdoor activities. Most of the notified polymer will be stabilised in the matrix of the treated fabric and not be available to the environment. There will be minimal release to the environment during the formulation and application of the coating agent.

Under normal usage, the notified polymer is not expected to enter the aquatic environment or pose any significant hazard to aquatic organisms. In the event of an accidental spill into the water compartment, the polymer's large molecular size will prevent movement across biological membranes and bioaccumulation. Overall the product is not expected to pose a significant risk to the environment.

## **13. HEALTH AND SAFETY RISK ASSESSMENT**

### **13.1. Hazard assessment**

No toxicological data were provided. The notified polymer has a high molecular weight and is not expected to be water soluble. It meets the criteria for classification as a PLC. Based on the available information, the notified polymer is not classified as hazardous under the NOHSC *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 1999).

### **13.2. Occupational health and safety**

Transport and storage workers will handle the 45% solution of the notified polymer in steel drums are not expected to come into contact with notified polymer. They will wear overalls and safety shoes. In the event of an accident, spills will be absorbed and disposed of in accordance with State/Territory regulations. Therefore, there would be no occupational health risk posed by the polymer during transportation and storage.

Laboratory staff will be potentially exposed to small amounts of the notified polymer when involved in preparation and testing of trial batches of the blend mix. However, given the small quantities handled, their training and appropriate PPE worn, no significant health risk would be expected.

Potential exposure of the formulation and coating workers would be predominantly via inhalation, ocular exposure and skin contact. On the basis of the available data, the notified polymer is not anticipated to pose a significant health hazard. However, the solvent (butanone) is irritant and flammable. During formulation and application of the coating, it is expected that workers would observe safe work practices, including wearing appropriate industrial standard PPE and using adequate engineering controls to minimise exposure, and hence a health risk. It is the responsibility of the employer to ensure that environmental concentrations of butanone are maintained below the NOHSC exposure standard. Overall, 'Polymer in Witcoflex 974' is of low concern to human health and safety under the proposed occupational settings.

### **13.3. Public health**

There will be significant public exposure to products containing the notified polymer as it is used in fabric coating. However, the notified polymer is bound to the fabric and is as such not bioavailable. Therefore, there is unlikely to be any public health risk posed by the polymer when used in the proposed manner.

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

### **14.1. MSDS**

The MSDS of the imported product, Witcoflex 974 containing 45% notified polymer in butanone, 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.

#### **14.2. Label**

The label for the import product, Witcoflex 974, 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**

#### *Control Measures*

##### Occupational Health and Safety

No specific measures are required for the notified polymer. However, in the interest of good occupational health and safety, the following guidelines and precautions should be observed for use of Witcoflex 974:

- Employers should implement the following engineering controls to minimise occupational exposure to the notified polymer supplied in the butanone solvent:
  - Appropriate local and general ventilation during formulation and application of the fabric coating agents.
- Employers should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified polymer supplied in the butanone solvent:
  - Laboratory coats, protective gloves and safety glasses for R&D and QC staff.
  - Protective overalls, impermeable gloves, chemical goggles/face shields and respiratory protection for workers involved in formulation and application of the fabric coating agents.

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.

##### Disposal

- The notified polymer should be disposed of in landfill.

##### Emergency procedures

- Spills/release of the notified polymer should be contained, absorbed in vermiculite, dry sand or earth, and the resulting waste disposed of in accordance with State/Territory regulations.

#### **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:

- (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.
- and

- (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.

## **16. REFERENCES**

Connell DW (1990) General characteristics of organic compounds which exhibit bioaccumulation. In: Connell DW ed. Bioaccumulation of xenobiotic compounds. Boca Raton, USA, CRC Press, pp 47-57.

NOHSC (1994a) National Code of Practice for the Preparation of Material Safety Data Sheets [NOHSC:2011(1994)]. National Occupational Health and Safety Commission, Canberra, Australian Government Publishing Service.

NOHSC (1994b) National Code of Practice for the Labelling of Workplace Substances [NOHSC:2012(1994)]. National Occupational Health and Safety Commission, Canberra, Australian Government Publishing Service.

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