

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

### POLYMER OF LOW CONCERN PUBLIC REPORT

#### Polymer in PERFAD 3050

This Assessment has been compiled in accordance with the provisions of the *Industrial Chemicals (Notification and Assessment) Act 1989* (Cwlth) (the Act) and Regulations. The National Industrial Chemicals Notification and Assessment Scheme (NICNAS) is administered by the Australian Government 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 Australian Government Department of Sustainability, Environment, Water, Population and Communities.

For the purposes of subsection 78(1) of the Act, this Public Report may be inspected at our NICNAS office by appointment only at Level 7, 260 Elizabeth Street, Surry Hills NSW 2010.

This 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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## SUMMARY

The following details will be published in the NICNAS *Chemical Gazette*:

ASSESSMENT REFERENCE	APPLICANT	CHEMICAL OR TRADE NAME	HAZARDOUS SUBSTANCE	INTRODUCTION VOLUME	USE
PLC/1135	Croda Singapore Pte Ltd (trading as Croda Australia)	Polymer in PERFAD 3050	No	≤ 300 tonnes per annum	Additive for machine oils and lubricants.

## CONCLUSIONS AND REGULATORY OBLIGATIONS

### **Human Health Risk Assessment**

Based on the assumed low hazard and the assessed use pattern, the notified polymer is not considered to pose an unreasonable risk to the health of workers and the public.

### **Environmental Risk Assessment**

Based on the assumed low hazard and the assessed use pattern, the notified polymer is not considered to pose an unreasonable risk to the environment.

### **Health and Safety Recommendations**

- 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 (M)SDS should be easily accessible to employees.
- If products and mixtures containing the notified polymer are classified as hazardous to health in accordance with the *Globally Harmonised System for the Classification and Labelling of Chemicals (GHS)*, as adopted for industrial chemicals in Australia, workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation should be in operation.

### **Environmental Recommendations**

- No specific control measures are required to minimise release of the notified polymer to the environment.

### **Disposal**

- The notified polymer should be disposed of in accordance with local regulations for recycling, re-use or recovery of calorific content.

### **Emergency Procedures**

- Spills and/or accidental release of the notified polymer should be handled by physical containment, collection and subsequent safe disposal.

### **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 polymer 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 polymer, have post-assessment regulatory obligations to notify NICNAS when any of these circumstances change. These obligations apply even when the notified polymer 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 notified polymer has changed from an additive in machine oils and lubricants or is likely to change significantly;
  - the amount of notified polymer being introduced has increased from 300 tonnes, or is likely to increase, significantly;
  - the notified polymer has begun to be manufactured in Australia;
  - additional information has become available to the person as to an adverse effect of the notified 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 (M)SDS of a product containing the notified polymer was provided by the applicant. The accuracy of the information on the (M)SDS remains the responsibility of the applicant.

### **ASSESSMENT DETAILS**

#### **1. APPLICANT AND NOTIFICATION DETAILS**

##### **Applicants**

Croda Singapore Pte Ltd, trading as Croda Australia (ABN 34 088 345 457)  
Suite 102, 447 Victoria Street  
WETHERILL PARK NSW 2164

##### **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 and identity of analogue polymer.

#### **2. IDENTITY OF POLYMER**

##### **Marketing Name(s)**

PERFAD 3050 (product containing the notified polymer)

##### **Molecular Weight**

Number Average Molecular Weight (Mn) is > 1,000 Da.

### 3. PLC CRITERIA JUSTIFICATION

<i>Criterion</i>	<i>Criterion met</i>
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	Dark brown viscous liquid <sup>1</sup>
Melting Point/Glass Transition Temp	> 21 °C (pour point) <sup>2</sup>
Density	0.97 kg/m <sup>3</sup> at 40 °C <sup>2</sup>
Water Solubility	Not determined. The notified polymer forms emulsions in water.
Reactivity	Stable under normal environmental conditions
Degradation Products	None under normal conditions of use
<sup>1</sup> PERFAD 3050 containing the notified polymer	
<sup>2</sup> Determined for an analogue of the notified polymer	

### 5. INTRODUCTION AND USE INFORMATION

#### 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>
Tonnes	300	300	300	300	300

#### Use

The notified polymer will not be manufactured in Australia. The notified polymer will be imported into Australia at concentrations of 10-100% and will be reformulated into machine oils and lubricants (at a concentration of < 10%). The formulated products are intended to be used without further dilution and may be used by consumers.

### 6. HUMAN HEALTH RISK ASSESSMENT

The notified polymer meets the PLC criteria and is therefore assumed to be of low hazard. This is supported by tests submitted on an analogue polymer for the following toxicological endpoints.

<i>Endpoint</i>	<i>Result</i>	<i>Effects Observed?</i>	
1. Rat, acute oral	LD50 > 2000 mg/kg bw	no	Not stated
2. Rat, acute dermal	LD50 > 2000 mg/kg bw	no	Not stated
4. Rabbit, skin irritation*	mildly irritating	yes	Not stated
5. Rabbit, eye irritation*	mildly irritating	yes	Not stated
6. Skin sensitisation - adjuvant test	no evidence of sensitisation	no	Maximisation test
8. Genotoxicity - bacterial reverse mutation	non mutagenic	no	OECD TG 471 – 472

\*Conducted with 10% of test substance in mineral oil (test substance contained analogue polymer at > 95% in xylene).

Slight skin and eye irritation effects were noted in the abovementioned studies. No skin and eye irritation studies were performed with the neat analogue polymer. A 10% preparation of the analogue polymer in mineral oil indicated slight irritation to rabbit skin and eyes. This preparation of analogue polymer also contained 0.5% xylene, which is irritating to skin. It is possible that the slight skin and eye irritation observed was due to xylene rather than the analogue polymer.

Overall, the notified polymer is considered to be of low hazard. Therefore, the risk of the notified polymer to occupational and public health is not considered to be unreasonable given the low hazard and the assessed use pattern.

## 7. ENVIRONMENTAL RISK ASSESSMENT

No ecotoxicological data were submitted. Polymers without significant ionic functionality are generally of low concern to the environment.

The notified polymer may be reformulated into finished products in Australia and used as a component of lubricants (75% of the total import volume) or metal working fluids (25%). During the reformulation processes, approximately 1% of the notified polymer is estimated to be released to the environment as accidental spillage. Any spills are expected to be collected and disposed of according to local regulations. The lubricants containing the notified polymer will be used in sealed units and the release of the notified polymer to the environment is expected to be limited. Metal working fluids containing the notified polymer will be applied to metal parts via spraying in a semi-enclosed circulatory system. Any spills and splashes during this use are expected to be contained by splash guards in manufacturing industrial sites and be reused, recycled or disposed of in accordance with local regulations.

Most of the notified polymer will be either thermally decomposed during use, recycling or refinement. A small amount of the notified polymer is expected to be sent to landfill as residues in containers or as a component of waste oil. It is estimated by the notifier that 15% of the waste metal working fluid will be directly disposed of to public sewage and 35% will be treated onsite prior to disposal to sewage. Therefore, up to 4.6%  $[(25\% \times 15\%) + (25\% \times 35\% \times 10\%)]$  of the notified polymer may be released to sewers as a result of disposal of waste metal working fluids. Under a worst case scenario, it is assumed that the release occurs on 260 working days and to a middle size sewage treatment plant (STP) with an average daily flow of 115 ML (Brisbane Water, QSL). Assuming that 90% of the notified polymer is removed via adsorption to sludge in the STP (Boethling RS & Nabholz JV, 1997), the resultant predicted environmental concentration in rivers ( $PEC_{river}$ ) is calculated as 46.15  $\mu\text{g/L}$  [ $PEC_{river} = (300000 \text{ kg/year} \times 4.6\% \times 10\%) \div (260 \text{ days} \times 115 \text{ ML/day})$ ]. The remainder of the notified polymer will partition to biosolids with an estimated concentration of 4.15 g/kg (dry wt), and is expected to be disposed of to landfill or applied to agricultural soils for soil remediation.

The notified polymer has potential to be readily biodegradable based on its functional groups. The notified polymer is not expected to be bioaccumulative or bioavailable to aquatic organisms due to its high molecular weight and expected low water solubility. The notified polymer is expected to be degraded into water and oxides of carbon by thermal decomposition in industrial facilities or by natural processes in landfill. Therefore, based on its assumed low hazard and assessed use pattern, the notified polymer is not considered to pose an unreasonable risk to the environment.

## **BIBLIOGRAPHY**

Boethling RS & Nabholz JV (1997) Environmental Assessment of Polymers under the U.S. Toxic Substances Control Act. In: Hamilton JD & Sutcliffe R, ed. Ecological Assessment of Polymers; Strategies for product stewardship and regulatory programs. New York, Van Nostrand Reinhold, pp 187–234.