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

FULL PUBLIC REPORT

Irgastat P 16 and Polymer in Irgastat P 18

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**Director
NICNAS**

TABLE OF CONTENTS

FULL PUBLIC REPORT	3
1. APPLICANT AND NOTIFICATION DETAILS	3
2. IDENTITY OF CHEMICAL	3
3. PLC CRITERIA JUSTIFICATION	3
4. PHYSICAL AND CHEMICAL PROPERTIES	4
5. INTRODUCTION AND USE INFORMATION	4
6. HUMAN HEALTH IMPLICATIONS	5
6.1. Exposure Assessment	5
6.2. Toxicological Hazard Characterisation	5
6.3. Human Health Risk Assessment	5
7. ENVIRONMENTAL IMPLICATIONS	6
7.1. Exposure Assessment	6
7.2. Environmental Hazard Characterisation	6
7.3. Environmental Risk Assessment	6
8. CONCLUSIONS	7
8.1. Level of Concern for Occupational Health and Safety	7
8.2. Level of Concern for Public Health	7
8.3. Level of Concern for the Environment	7
9. MATERIAL SAFETY DATA SHEET	7
9.1. Material Safety Data Sheet	7
10. RECOMMENDATIONS	7
10.1. Secondary Notification	7

FULL PUBLIC REPORT**Irgastat P 16 and Polymer in Irgastat P 18****1. APPLICANT AND NOTIFICATION DETAILS**

APPLICANT(S)

Ciba Specialty Chemicals Pty Ltd (ABN: 97 005 061 469)
235 Settlement Road
Thomastown Victoria 3074

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
- Molecular Formula
- Structural Formula
- CAS Number
- Polymer Constituents
- Details of use
- Import Volume
- Molecular Weight
- Composition details

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 (DSL)

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

Irgastat P 16 (> 90% notified polymer)
Irgastat P 18 (30-60% notified polymer)

MOLECULAR WEIGHT (MW)

Number Average Molecular Weight (Mn)	>10000
% of Low MW Species < 1000	< 2
% of Low MW Species < 500	< 2

REACTIVE FUNCTIONAL GROUPS

The notified polymer contains only low concern functional groups.

3. PLC CRITERIA JUSTIFICATION

Criterion

Criterion met

	(yes/no/not applicable)
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	Colourless pellets
Melting Point/Glass Transition Temp	159 - 172°C
Density	550-650 kg/m ³
Water Solubility	2.3 × 10 ⁻³ g/L at 23°C The water solubility of the notified polymer was determined using the gravimetric method. Approximately 1 g of the notified polymer was weighed accurately after desiccation. After dissolution of the desiccated polymer in water, the undissolved polymer was collected and reweighed.
Dissociation Constant	The notified polymer contains a functional group, which is expected to have a pKa of 4.0.
Particle Size	The notified polymer is in the form of pellets in the range of 1mm – 5mm.
Reactivity	Stable under normal environmental conditions.
Degradation Products	Temperatures above 300°C cause thermal decomposition giving toxic products such as carbon monoxide, ammonia and amino derivatives.

5. INTRODUCTION AND USE INFORMATION

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

Year	1	2	3	4	5
Tonnes	1-10	1-10	1-10	1-10	1-10

USE AND MODE OF INTRODUCTION AND DISPOSAL

Mode of Introduction

The notified polymer will be present in Irgastat P 16 at a level of > 90% and in Irgastat P 18 at a level of 30-60%. It will be imported as odourless colourless pellets in 25 kg paper bags (Irgastat P 16) or as odourless white pastilles in 2 x 20 kg bags in a fibreboard box (Irgastat P 18). The products will be imported by sea and air and transported by road from the Port of Melbourne or Melbourne airport to the Ciba Specialty Chemicals warehouse site at Thomastown in Victoria. From the Thomastown site, the products will be delivered by road to one customer in Victoria.

The notified polymer will be formulated into thermoplastic polymers.

Reformulation/manufacture processes

Irgastat P 16 and Irgastat P 18 will be compounded at the customer site into a styrenic compound via a twin screw extrusion process. The recommended use levels are 8 – 25% for Irgastat P 16 and 4 – 15% for Irgastat P 18.

During the compounding process, the colourless pellets will be combined with other raw materials to form coloured plastic pellets known as masterbatch. The plant operator manually weighs out the pellets and transfers the requisite amount into plastic bags. These pellets and other ingredients are transferred into a mixer. The mixer is sealed during mixing. After mixing, the extruder operator releases the mixture from the sealed dispenser into the twin screw extruder. In the extruder, the mixture is melted and extruded through die holes in long spaghetti-like strings, passes through a cooling water bath into a pelletiser and classifier, which cuts the strings into pellets, which are graded and conveyed to a hopper for storage. A quality control technician scoops a portion of the masterbatch into a sample container for testing. The quality of the pellets is tested against a number of quality control tests using standard laboratory procedures. Following quality control testing, a packaging operator will bag the masterbatch into 25-kg bags, ready for export distribution. Up to 100 kg of notified polymer will be used in thermoplastic polymers in Australia.

Use

The notified polymer will be used as a component in thermoplastic polymers to form finished articles (e.g. computer housing).

6. HUMAN HEALTH IMPLICATIONS**6.1. Exposure Assessment****OCCUPATIONAL EXPOSURE**

Dermal and ocular exposure can occur during certain formulation processes. However, exposure to significant amounts of the notified polymer is limited because of the engineering controls and personal protective equipment worn by workers.

Workers may be exposed to dust particles generated from the compounding of the thermoplastic polymers. Dermal exposure to the pellets may also occur. However, exposure to significant amounts of the notified polymer is limited because of the engineering controls and personal protective equipment worn by workers.

During transport and storage, workers are unlikely to be exposed to the notified polymer except when packaging is accidentally breached.

PUBLIC EXPOSURE

The notified polymer will not be available to the public as the majority of the final masterbatch product containing the notified polymer will be exported overseas. However, there is potential exposure in the form of finished articles being exported back to Australia (e.g. computer housing). Therefore, there is potential for extensive public exposure to finished articles comprised partly of the notified polymer.

6.2. Toxicological Hazard Characterisation

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

6.3. Human Health Risk Assessment**OCCUPATIONAL HEALTH AND SAFETY**

The OHS risk presented by the notified polymer is expected to be low, given the expected low hazard of the polymer and the engineering controls.

PUBLIC HEALTH

The notified polymer will not be available to the public. Members of the public may make dermal contact with products containing the notified polymer. However, the risk to public health will be negligible because the notified polymer is bound within a matrix and unlikely to be bioavailable.

7. ENVIRONMENTAL IMPLICATIONS**7.1. Exposure Assessment****ENVIRONMENTAL RELEASE**

Since the notified polymer will not be manufactured locally, there will be no environmental exposure associated with this process in Australia. It is estimated that the loss of the notified polymer as residue in empty pellet containers will be up to 0.1% and due to spills during production to be up to 0.1% (up to a total of 10 kg per annum). Spilled material, being solid and in pellet form, will typically be collected with a broom and bagged, and may be melted and reprocessed or disposed of to landfill as normal industrial waste via a waste contractor. The import bags containing the residues may be recycled or sent to landfill.

ENVIRONMENTAL FATE

Some scrap plastic may be reprocessed and reused in commercial applications. It is estimated that <1% of the plastic waste from commercial processing would be released to the environment after recycling. Therefore, up to 100 kg per year may be disposed to landfill as scrap plastic or pellets. The majority of the notified polymer will be incorporated into moulded or extruded plastic articles which will be eventually disposed to landfill at the end of their useful lives. It is anticipated that prolonged residence in an active landfill environment would eventually degrade the notified polymer due to abiotic or slow biotic processes to give water vapour, and oxides of carbon and nitrogen.

7.2. Environmental Hazard Characterisation

No ecotoxicological data were submitted.

Anionic polymers are known to be moderately toxic to algae. The mode of toxic action is overchelation of nutrients elements needed by algae for growth. The highest toxicity is when the acid is on alternating carbons of polymer backbones. This is unlikely to apply to the notified polymer. However, the toxicity to algae is likely to be reduced due to the presence of calcium ions, which would bind to the functional groups.

7.3. Environmental Risk Assessment

Almost all of the notified polymer will be used to manufacture a compound for export. Once incorporated into moulded articles (e.g. computer housing), the notified polymer is expected to be inert and is unlikely to pose a risk to the environment. It is anticipated that the majority of the wastes generated during the manufacture of articles will be collected and reused.

Virtually all of the notified polymer imported (up to 10 tonnes per annum including from spills, container residues, waste from processing of plastic scrap and the plastic articles at the end of their useful lives) will eventually be disposed of to landfill as inert solid waste. In landfill, the polymer contained in waste or the articles is expected to be immobile due to its inert state and low water solubility.

Based on the proposed use pattern, the release of the notified polymer to the environment is expected to be very low. The use pattern of the notified polymer will result in limited if any exposure to the aquatic environment. While no ecotoxicity data are available, it is unlikely to pose adverse ecotoxicological effects in the aquatic compartment. The high molecular weight indicates a low potential for bioaccumulation.

Based on the reported exposure levels and use pattern, the polymer is not considered to pose a risk to the environment when it is stored, transported and used in the proposed manner.

8. CONCLUSIONS

8.1. Level of Concern for Occupational Health and Safety

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

8.2. Level of Concern for Public Health

There is No Significant Concern to public health when used in the proposed manner.

8.3. Level of Concern for the Environment

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

9. MATERIAL SAFETY DATA SHEET

9.1. 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.

10. 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 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 with domestic refuse according to local regulations.
- Contaminated packaging should be recycled once completely emptied.

Emergency procedures

- Spills/release of the notified polymer should be handled by sweeping or shoveling up. The collected material should be placed in a sealable, labeled container and recycled if possible or disposed of to landfill.

10.1. 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.