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

FULL PUBLIC REPORT

SC721-3

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**Director
Chemicals Notification and Assessment**

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FULL PUBLIC REPORT

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1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)

Sharp Corporation of Australia Pty Ltd of 1 Huntingwood Drive, Blacktown NSW 2148 (ABN 40 003 039 405)

NOTIFICATION CATEGORY

The notified polymer meets the PLC criteria.

EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Chemical name, CAS number, molecular formula, spectral data, polymer constituents, residual monomers and impurities, functional group equivalent weight, import volume, site of manufacture.

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

None

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

SC721-3

MOLECULAR WEIGHT

Number Av MW > 1000

3. COMPOSITION

DEGREE OF PURITY

>98%

POLYMER CONSTITUENTS

The notified polymer is composed of monomers listed on AICS

RESIDUAL MONOMERS

All residual monomers are below the relevant cut-offs for classification of the notified polymer as a hazardous substance (NOHSC 1999a).

4. INTRODUCTION AND USE INFORMATION

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

Imported

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>	< 1	< 1	< 1	< 1	< 1

USE

The notified polymer is a component in photocopy toners.

5. PROCESS AND RELEASE INFORMATION

5.1. Distribution, Transport and Storage

PORT OF ENTRY

Not stated.

TRANSPORTATION AND PACKAGING

The notified polymer will be imported. Details of container/cartridge type/size/mass were not stated. In general, these are typically 200 to 1500 g sealed cartridges or 0.2 to 4 L bottles containing approximately 100 to 2500 g of toner.

5.2. Operation Description

The notified polymer will be imported as a component of the product, AR-C26YE, AR-C26ME and AR-C26CE comprising 85-95% of the product. No formulation will occur in Australia.

5.3. Occupational exposure

Number and Category of Workers

<i>Category of Worker</i>	<i>Number</i>
Copier maintenance workers	800
Copier operators	450

Exposure Details

Copier maintenance workers may be exposed to the notified polymer while cleaning the developing unit, collecting waste toner and maintaining the copier. Photocopier operators may be exposed during replacement of the toner cartridge.

5.4. Release

RELEASE OF CHEMICAL AT SITE

The notified polymer will be imported in packages in purpose-built containers (cartridges and bottles). Release of the toner containing the notified polymer to the environment is not expected under normal transportation, handling and storage as each toner container is designed to prevent leakage.

RELEASE OF CHEMICAL FROM USE

Release of the toner containing the notified polymer to the environment is not expected under normal use as each toner container is designed to prevent leakage.

Environmental release may result from disposal of the toner-impregnated paper and discarded bottles/cartridges that are not recycled, or from accidental spills from the bottles/cartridges during use.

5.5. Disposal

Some waste paper may be disposed of directly to landfill with the notified polymer strongly bound to the paper. It is anticipated that prolonged residence in a landfill environment would eventually degrade the notified polymer. Incineration of waste paper will destroy the notified polymer and generate water vapour and oxides of carbon.

No data on the mass of toner residue in emptied toner containers was stated; however, it is expected that 1 to 5% (1 to 125 g) of the notified polymer may remain in the used bottle/cartridge.

In addition to landfill, some of the printed-paper will enter the paper recycling process. During such processes, waste paper is repulped using a variety of alkaline, dispersing and wetting agents, water emulsifiable organic solvents and bleaches. These agents enhance fibre separation, toner detachment from the fibres, paper brightness and whiteness. Wastewaters from this process are likely to be discharged to on-site wastewater treatment plants (WWTP). The repulping process is estimated to extract about 30-60% of the toner from the pulped paper (eg. <300-<600 kg), with the remainder (40 to 70%; <400-<700 kg) incorporated into the new recycled paper product. On-site WWTPs generate wastewater effluents and sludges. WWTP effluents are typically recycled and reused in the pulping facility, although disposal to sewer is an option. Sludges are disposed of to landfill or incinerated. Due to low water solubility and potential for partitioning to particulate matter, it is likely that sludges will contain the bulk of the notified polymer and very little of the notified polymer is expected to partition to the supernatant water which is released to the sewer.

As printed-paper products are disposed of over time, practically all of the total import volume of the notified polymer with eventually be disposed of to landfill or incinerated.

5.6. Public exposure

The public will be exposed to the toner after use, when it is expected to be fixed to the paper.

6. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa	Pale yellow powder (odourless)
Melting Point/Freezing Point	110-135°C
Density	1.3 kg/m ³ at 20°C
Water Solubility	Not determined quantitatively. Stated as insoluble. Estimated by QSAR using USEPA Biowin Version 4 at 0.0005 mg/L at 25°C

Remarks: QSAR (USEPA Biowin Version 4) calculations for high molecular weight polyesters with no functional groups predict negligible solubility (0.5 ppb).

Particle Size

Particle size (µm)	% by weight
>500	38.6
500-355	18.0
355-150	30.1
150-100	11.2
100-75	0.4
<75	1.7

Flammability Not measured.

Remarks The notified polymer is combustible.

Explosive Properties Not measured.

Remarks The notified polymer is not expected to be explosive.

Degradation Products None

Loss of monomers, other reactants, additives impurities

Remarks None

ADDITIONAL TESTS

Hydrolysis as a Function of pH

Not measured.

Remarks The notified polymer contains ester groups but is unlikely to hydrolyse at environment pH range of 4 to 9 due to its probable low water solubility.

Partition Coefficient (n-octanol/water)

Not measured.

Remarks Log K_{OW} estimated by QSAR using USEPA Biowin Version 4 at 3.82 at 25°C, therefore will favour octanol phase.

Adsorption/Desorption

Not measured.

Remarks Likely to adsorb to organic matter due to its estimated high partition co-efficient and low water solubility.

Dissociation Constant

Not determined.

Remarks The notified polymer is expected to contain some free carboxylic acid with typical acidity.

7. TOXICOLOGICAL INVESTIGATIONS

No toxicological data were submitted.

8. ENVIRONMENT

No aquatic ecotoxicological data were submitted.

9. RISK ASSESSMENT

9.1. Environment

9.1.1. Environment – exposure assessment

Negligible environmental release of the notified polymer is likely to occur during importation, transportation, storage, handling and use due to packaging specifications, small quantities per container, product management procedures, and use pattern (ie. photocopiers/printers).

Environmental release may occur following disposal of the printed-paper product or from paper recycling, with the majority sent to landfill for disposal either in paper or in WWTP sludges. A small proportion (eg. 1-5%) may also be sent to landfill in emptied toner containers that are not recycled. The use pattern is likely to be widespread throughout Australia (ie. <1 tonne Australia-wide). Notified polymer in recycled paper waste sludges may also be incinerated, thus destroying the notified polymer.

As a consequence of its low water solubility, the notified polymer is likely to be immobilised through adsorption to organic components of soils and landfilled waste material. As such, it is unlikely that the notified polymer would mobilise into landfill leachate or leachate-affected groundwater. In general, the long residence time in landfills would allow abiotic and slow biotic processes to degrade the notified polymer in landfilled wastes.

The notified polymer may potentially bioaccumulate as it has an estimated log K_{OW} of approximately 3.8; however, the high molecular weight of the compound would limit passage through biological membranes (Connell, 1989).

9.1.2. Environment – hazard assessment

The notified polymer is expected to have a low acute toxicity due to its low water solubility and high molecular weight.

9.1.3. Environment – risk characterisation

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

9.2. Human health

9.2.1. Occupational health and safety – exposure assessment

Dermal and inhalation exposure of office workers to the notified polymer will potentially occur when replacing spent cartridges and clearing paper jams from the printer or photocopier.

Dermal and inhalation exposure of maintenance workers to the notified polymer is possible during routine maintenance. The national exposure standard for nuisance dusts is 10 mg/m³ TWA [NOHSC, 1995]. Australia has no exposure standard for respirable dust, however, the ACGIH TLV of 3 mg/m³ TWA is recommended [ACGIH, 2001]. The design of the cartridges is such that exposure to the notified polymer should be low. The predicted airborne concentration of toner dust in the vicinity of a photocopier is <0.1 mg/m³ (EASE).

9.2.2. Public health – exposure assessment

Public exposure is expected to be limited, as the notified polymer is bound to the paper after use and is unlikely to be bioavailable.

9.2.3. Human health - effects assessment

The notified polymer meets the PLC criteria and therefore low hazard is expected due to the lack of reactive functional groups and the inability of the polymer to penetrate biological membranes. The dust may cause mechanical irritation to the eyes, and to the respiratory tract if inhaled.

9.2.4. Occupational health and safety – risk characterisation

Based on the low hazard of the notified polymer and the predicted low exposure, the OHS risk presented by the notified polymer is expected to be low.

9.2.5. Public health – risk characterisation

As there will be no exposure of the public to the notified polymer or products containing the notified polymer, the risk to the public from exposure to the notified polymer is considered low.

10. CONCLUSIONS – ASSESSMENT LEVEL OF CONCERN FOR THE ENVIRONMENT AND HUMANS**10.1. Hazard classification**

Based on the available data the notified polymer is not classified as hazardous under the NOHSC *Approved Criteria for Classifying Hazardous Substances* (1999b).

10.2. Environmental risk assessment

The polymer 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 Low Concern to public health when used in the manner described.

11. MATERIAL SAFETY DATA SHEET**11.1. Material Safety Data Sheet**

The MSDS of the toner containing the polymer 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 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 toner containing the polymer 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.

12. 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.
- Service personnel should wear cotton or disposable gloves and ensure adequate ventilation is present when removing spent toner cartridges containing the notified polymer and during routine maintenance and repairs.
- 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.

Environment**Disposal**

- The notified polymer should be disposed of in accordance with the methods described in the Material Safety Data Sheet, including by licensed waste contractor and in accordance with local jurisdiction waste management guidance.

Emergency procedures

Spills/release of the notified polymer should be handled by wiping off with a clean cloth. Do not use a vacuum cleaner when large amount is released, as the toner is capable of creating a dust explosion.

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 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.

No additional secondary notification conditions are stipulated.

13. BIBLIOGRAPHY

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