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**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION
AND ASSESSMENT SCHEME**

FULL PUBLIC REPORT

F-210

This Assessment has been compiled in accordance with the provisions of the *Industrial Chemicals (Notification and Assessment) Act 1989, as amended* and Regulations. This legislation is an Act of the Commonwealth of Australia. The National Industrial Chemicals Notification and Assessment Scheme (NICNAS) is administered by Worksafe Australia which also conducts the occupational health & safety assessment. The assessment of environmental hazard is conducted by the Department of the Environment, Sport, and Territories and the assessment of public health is conducted by the Department of Health, Housing, Local Government and Community Services.

For the purposes of subsection 78(1) of the Act, copies of this full public report may be inspected by the public at the Library, Worksafe Australia, 92-94 Parramatta Road, Camperdown NSW 2050, between the hours of 10.00 a.m. and 12.00 noon and 2.00 p.m. and 4.00 p.m. each week day except on public holidays.

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Director
Chemicals Notification and Assessment

FULL PUBLIC REPORT**F-210****1. APPLICANT**

Inchcape Office Products, 12 Barcoo Street, East Roseville NSW
2069

2. IDENTITY OF THE CHEMICAL

Based on the nature of the chemical and the data provided, F-210 is considered to be non-hazardous. Therefore the chemical name, CAS number, structural and molecular formulae, molecular weight, spectral data, monomer composition, specific use and the import volume have been exempted from publication in the Full Public Report and Summary Report.

Other names: F-210 F-210

Trade name: RICOH FT Toner Type SI (product
containing the notified polymer)

Number-average molecular weight: >10000

**Maximum percentage of low
molecular weight species
(molecular weight < 1000):** <0.2%

3. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa: white granular powder

Melting Point: 130°C

Boiling Point: could not be determined as the
chemical began thermal
decomposition at 250°C

Specific Gravity/Density: 1200 kg/m³ @ 25°C

Vapour Pressure:	negligible (<0.67 kPa @ 25°C for the toner formulation)
Water Solubility:	negligible (<1 x 10 ⁻⁴ g/L @ 30°C)
Adsorption/Desorption:	not provided
Flash Point:	could not be ignited (Setaflash Closed Cup)
Flammability Limits:	not flammable (based on vapour pressure and flash point)
Combustion Products:	carbon dioxide and trace amounts of hydrogen fluoride (carbon monoxide if combustion is incomplete)
Autoignition Temperature:	> 250°C (based on boiling point, vapour pressure, flash point and flammability)
Explosive Properties:	not explosive under influence of heat (based on boiling point data: did not explode before decomposition at 250°C)
Reactivity/Stability:	not considered reactive (based on boiling point data)
Particle size distribution:	not relevant, polymer is a liquid

Comments on Physico-Chemical Properties:

The polymer is described as insoluble, however the presence of ester groups in the polymer indicates a potential for hydrolysis to products with increased water solubility. This is unlikely at environmental pH, and given the high molecular weight of the polymer.

The partition coefficient was not determined for F-210, on the grounds that the substance is of low water solubility. This is acceptable.

Adsorption/desorption data were not provided, on the grounds that the low volume of importation and method of use of the chemical "will present opportunities for release of any significant quantity into any compartment of the environment". Given the anticipated low water solubility and low risk of environmental exposure, this is acceptable.

Data regarding the dissociation constant were not provided, on the grounds that given the low water solubility of F-210, dissociation will not occur. There are no acidic hydrogens within the polymer that would indicate that dissociation could occur.

4. PURITY OF THE CHEMICAL

Degree of purity: >99.8%

Toxic or hazardous impurities: <0.1%

One hazardous impurity was identified to be present in F-210. The identity of this impurity has been exempted from publication in the Full Public Report, as it is present at levels below the cut-off concentration for classifying F-210 as a hazardous substance (1).

Non-hazardous impurities: none (> 1% by weight)

Maximum content of residual monomers: <0.2%

Additives/Adjuvants: none

5. INDUSTRIAL USE

F-210 will be imported into Australia as a photocopier toner additive. Less than 1000 kg of F-210 will be imported per annum.

6. OCCUPATIONAL EXPOSURE

F-210 will not be manufactured in Australia. Ready to sell packages of photocopier toner containing < 1% of the notified polymer, will be imported into Australia and distributed to

office photocopier users Australia-wide. The toner is contained in a sealed tin container with a spring loaded cap which can not release product during normal operation and which is opened only once the tin container is installed in the machine. Any risk of worker exposure during use, storage and transport is unlikely.

Workers likely to be exposed to F-210 are photocopier service engineers involved in the installation and maintenance of liquid process photocopiers. Approximately 50-60 service engineers will be involved in these tasks in Australia and will be servicing many machines on a daily basis. Office workers who add toner to photocopiers *in situ*, including workers involved in full time photocopying and machine upkeep, may also be potentially exposed to F-210.

The number and categories of workers using the product in Australia will be numerous depending on the number of machines used and the amount of photocopying carried out on each machine. The product containing the chemical is in a sealed tin container thus minimising direct contact of humans with the notified chemical.

7. PUBLIC EXPOSURE

The material safety data sheet for the toner solution indicates there are no special requirements for transport. Due to the low concentration of the notified polymer in the toner solution there is low potential for public exposure during storage and distribution.

As the concentration of the notified polymer in the toner solution is low it is expected to have a low vapour pressure (boiling point data indicated there was no decrease in weight of a sample of the notified polymer until thermal decomposition occurred at 250°C), public exposure to the notified chemical is not expected to occur during the replacement of toner solution in photocopying machines.

Toner solution, containers and materials contaminated with toner solution will be disposed of by landfill (for 'small quantities') or by incineration (for 'significant quantities') in accordance with local regulations.

Due to the low concentration of notified polymer in the toner solution public exposure resulting from contact with residues on photocopier paper is expected to be minimal. Further, due to the high number-average molecular weight of the notified polymer, absorption through biological membranes would not be expected to occur.

8. ENVIRONMENTAL EXPOSURE

. Release

As all formulation and packaging will be carried out overseas, no environmental exposure is expected in Australia from these processes.

Toner is added to photocopiers as required. The contents of the entire packet is added to the machine, and the empty toner container is discarded. The product, its containers and materials contaminated with the product can be disposed of as domestic waste to landfill or by incineration, in accordance with local, State and Federal regulations.

Releases to the environment may occur through spills during transport, disposal of spilt material or processing of waste paper. This possibility is explored further below.

. Fate

Unless incinerated, the polymer is likely to arrive in a dispersed manner in landfill bound to waste paper. As such, it will be immobile, and no leaching from landfill would be expected despite the polymer's expected persistence.

Paper recycling is a growing industry in Australia. Wastepaper is repulped using a variety of alkalis, dispersing agents, wetting agents, water emulsifiable organic solvents and bleaching agents. These chemicals enhance fibre separation, ink detachment from the fibres, pulp brightness and whiteness of the paper. After pulping, the contaminants and the ink are separated from the fibres by pumping the stock through various heat washing, screening, cleaning, flotation and dispersion stages.

The notifier has provided no data on the likely behaviour of the polymer during the recycling process. The presence of ester

groups in the polymer indicate a potential for hydrolysis to products with increased water solubility. The polymer is likely to survive the above conditions, either remaining bound to the pulp or becoming associated with the sludge. In the latter case, the polymer will either arrive in landfill where it can be expected to remain intact, or be destroyed through incineration.

Spillage during transport or during filling of toner packages during use would be disposed of to landfill, following collection of spills into suitable containers, and placement into domestic waste containers.

9. EVALUATION OF TOXICOLOGICAL DATA

Under the *Industrial Chemicals (Notification and Assessment) Act, 1989, as amended* (the Act) toxicity data are not required for chemicals manufactured or imported in volumes less than 1 tonne/year or for chemicals with number-average molecular weight (NAMW) > 1000. However, a genotoxicity study was provided (the original was in Japanese, but was summarised in English by the notifier) and is assessed below:

9.1 *Salmonella typhimurium* Reverse Mutation Assay (2)

This study was described as being conducted in accordance with *OECD Guidelines for Testing Chemicals No: 471* (3).

F-210 was tested for potential gene mutation according to the direct plate incorporation method using *Salmonella typhimurium* strains TA 98, TA 100, TA 1535, and TA 1537, both in the presence and absence of microsomal activation. Positive controls used were 2-aminoanthracene, 2-(2-furyl)-3-(5-nitro-2-furyl) acrylamide, sodium azide and ICR-191. In a range finding test (0, 3, 10, 30 or 100 µg/plate), as well as in a second trial (0, 0.62, 1.25, 2.5, 5 or 10 µg/plate), no significant increase in the number of revertant colonies (ie. 2-fold above background) was observed in any of the strains exposed to F-210, both in the presence and absence of microsomal activation. Distinct increases in the number of revertant colonies were reported after dosing with the positive controls.

The results of this study suggest that F-210 is not genotoxic towards *Salmonella typhimurium*.

10. ASSESSMENT OF ENVIRONMENTAL EFFECTS

No ecotoxicological data were provided, which is acceptable for polymers of NAMW > 1000 according to the Act. The notified substance would not be expected to exhibit toxic characteristics because large insoluble polymers of this nature are not readily absorbed by biota.

11. ASSESSMENT OF ENVIRONMENTAL HAZARD

The low environmental exposure of the polymer as a result of normal use indicates that the overall environmental hazard should be negligible.

Spillage during transport or disposal of spilt material in landfills should represent very minor risk to the environment, as the concentration of F-210 is low. Carbon black and petroleum naphtha (other ingredients of the product) represent greater risks. Accidental spillage of the polymer should result in negligible hazard as it will be marketed in small packages for direct insertion into photocopier machines.

Environmental exposure to the notified substance could occur when paper containing the polymer is recycled or disposed of, or through accidental spillage during transport of the toner. In each case, the final destination is likely to be landfill where the polymer can be expected to persist but remain immobile, being either bound to paper or to the sludge from the recycling process.

12. ASSESSMENT OF PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY EFFECTS

F-210 will not be manufactured in Australia, but will be imported in low amounts as an ingredient (<1% concentration) in a formulated product. The main occupational exposure to F-210 is likely to be by skin and eye contact, however as the notified chemical is a polymer with NAMW > 10000, it is unlikely to cross biological membranes and cause significant systemic effects. F-210 contains <0.1% of a hazardous impurity, however this level is below the concentration cut-off for classifying the chemical as a

hazardous substance (1). F-210 was shown to be non-mutagenic in a bacterial mutation assay.

The number of workers potentially exposed to F-210 is high, however, as the product will be contained in a sealed can, direct contact with the notified chemical should be minimal.

Due to the low concentration of the notified polymer (<1%) and the hazardous impurity (<0.001%) in the toner solution, public exposure is expected to be low and there should be negligible risk to public safety.

Under normal use conditions, the notified chemical will be of low risk to human health.

13. RECOMMENDATIONS

To minimise occupational exposure to F-210 the following guidelines and precautions should be observed:

- . Good work practices should be implemented to avoid spillages.
- . Good personal hygiene should be observed.
- . A copy of the Material Safety Data sheet for F-210 and products containing it should be easily accessible to workers.

14. MATERIAL SAFETY DATA SHEET

The Material Safety Data Sheet (MSDS) for product containing F-210 (Attachment 1) was provided in Worksafe Australia format (4). The MSDS was provided by Inchcape Office Products Pty Ltd as part of their notification statement. It is reproduced here as a matter of public record. The accuracy of this information remains the responsibility of Inchcape Office Products Pty Ltd.

15. REQUIREMENTS FOR SECONDARY NOTIFICATION

Under the *Industrial Chemicals (Notification and Assessment) Act 1989, as amended* (the Act), secondary notification of F-210 shall be required if any of the circumstances stipulated under

subsection 64(2) of the Act arise. Also, if import volumes rise above 1 tonne per annum, additional environmental information will be required. This would need to include the hydrolytic fate of the polymer during paper recycling.

16. **REFERENCES**

1. National Occupational Health and Safety Commission, *Guidance Note for Determining and Classifying a Hazardous Substance*, Australian Government Publishing Service Publ., Canberra, 1991.
2. English translation of: *Ames Test Report for F-210* - Report No. NS91-02315 (in Japanese).
3. OECD Guidelines for Testing of Chemicals - *Genetic Toxicology: Salmonella typhymurium, Reverse Mutation Assay* No: 471, 1983.
4. National Occupational Health and Safety Commission, *Guidance Note for Completion of a Material Safety Data Sheet*, 3rd Edition, Australian Government Publishing Service Publ., Canberra, 1991.