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NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION
AND ASSESSMENT SCHEME

FULL PUBLIC REPORT

Polymer in DYNOADD F-3

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Director
Chemicals Notification and Assessment

FULL PUBLIC REPORT

DYNOADD F-3

1. APPLICANT

Ashland Pacific Pty Ltd of Sir Thomas Mitchell Road CHESTERHILL NSW 2162 has submitted a limited notification statement in support of their application for an assessment certificate for Polymer in DYNOADD F-3

2. IDENTITY OF THE CHEMICAL

Polymer in DYNOADD F-3 is not considered to be hazardous based on the nature of the chemical and the data provided. Therefore the chemical name, CAS number, molecular and structural formulae, exact molecular weight, spectral data and details of the polymer composition have been exempted from publication in the Full Public Report and the Summary Report.

Trade Name:	Dynoadd F-3
Number-Average Molecular Weight (NAMW):	> 1 000
Weight-Average Molecular Weight:	< 5 000
Maximum Percentage of Low Molecular Weight Species	
Molecular Weight < 500:	< 10%
Molecular Weight < 1 000:	< 50%
Method of Detection and Determination:	The polymer has been characterised using infra-red (IR) and proton nuclear magnetic resonance spectroscopy (NMR). The number-average (Mn) and weight average (Mw) molecular weights were determined by size exclusion chromatography (SEC).

3. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa:	clear
Boiling Point:	not applicable (100% non volatile polymer)

Specific Gravity:	1.09 g/cm^3
Vapour Pressure:	not determined
Water Solubility:	not determined (see notes below)
Partition Co-efficient (n-octanol/water):	not determined (see notes below)
Hydrolysis as a Function of pH:	not determined (see notes below)
Adsorption/Desorption:	not determined (see notes below)
Dissociation Constant:	not determined (see notes below)
Flash Point:	> 100°C
Flammability Limits:	not determined
Autoignition Temperature:	no autoignition
Explosive Properties:	not explosive
Reactivity/Stability:	stable if bases, heat and air are avoided

Comments on Physico-Chemical Properties

Given the high number-average molecular weight of the notified polymer, the vapour pressure of the polymer is expected to be low. The water solubility of the polymer is also expected to be low since there are no hydrophilic functionalities that would confer water solubility.

The pendant ester linkages in the polymer backbone could be susceptible to hydrolysis under extreme pH conditions, but this is unlikely in the normal environmental pH range (4-9). The low water solubility also makes hydrolysis unlikely.

The material contains no markedly polar groups and is expected to be hydrophobic. Therefore the octanol/water partition coefficient is expected to be high. Given the expected hydrophobic nature of the notified material, it would adsorb to, and become associated with, the organic components of soils and sediments.

The polymer contains no readily dissociable groups and will therefore have no meaningful dissociation constant.

4. USE, VOLUME AND FORMULATION

The notified polymer will not be manufactured in Australia, but will be imported in 20 L steel drums. Import volumes for the notified polymer are stated by the notifier

to be approximately 300 kg per annum.

The notified polymer is used as a leveling aid in paint formulations intended for metal can (ie food can) coating, and will be blended into the paint formulations at the Courtaulds Australia site at Sunshine Victoria. The notified material will constitute less than 1% of the paint product.

The formulated paint will be used by one or two industrial can producers for application of a heat cured polymer coating to the inside walls and ends of tin plated steel cans intended for processed food storage. The formulation will be applied to coils of plated steel using rollers, and then cured by feeding the coated steel into a continuous drying oven. Once the paint coating has cured the notified material is effectively immobilised in an inert crosslinked polymer matrix.

5. OCCUPATIONAL EXPOSURE

The Polymer in Dynoadd F-3 is a water insoluble viscous liquid. Minimal production of vapour or aerosols is expected during the manufacturing process (due to the low vapour pressure) which consists of a simple sequence of blending, filtration and drum-filling.

At the Courtaulds site, a maximum of 57 workers are likely to be exposed to the material. These include quality control operators, maintainence workers, paint plant operators and development personnel. The notifier states that the latter three categories of workers will use personal protective equipment including overalls, gloves, glasses/goggles, and respirators.

Workers involved in the transportation of Dynoadd F-3 from Ashland Pacific to Courtalds in Victoria are unlikely to be exposed to the chemical, except in cases of accidental spillage. Storage personnel are also unlikely to be exposed to the material.

Local exhaust ventilation will be used during the sampling, testing and drum filling phases of paint production.

Occupational exposure to the notified chemical in the finished paint product is expected to be minimal because of the engineering controls employed during paint application, and the concentration of the notified chemical in the paint product. The formulation will be applied to coils of plated steel using rollers, and then cured by feeding the coated steel into a continuous drying oven. Once the paint coating has cured, the notified material is effectively immobilised in an inert cross-linked polymer matrix.

6. PUBLIC EXPOSURE

DYNOADD F-3 is intended for use in heat cured paints in which it will be present at less than 1%. The formulated paint will be used to coat the inside walls of tin plated steel cans intended for processed food storage. After curing the notified chemical

will be cross-linked and bound into the matrix of the paint. Although contact with the notified chemical may be widespread, exposure is likely to be minimal.

The notified chemical is a non water-soluble viscous liquid. Minimal production of vapour or aerosols is expected during the manufacturing process which consists of a simple sequence of blending, filtration, and drum filling. Exposure of the public to the notified chemical as a result of the manufacturing process is unlikely.

In the event of a transport accident, the physical and chemical properties of the notified chemical will prevent significant dispersion. As the flash point is greater than 100^{o}C, the fire hazard in such circumstances is minimal.

7. ENVIRONMENTAL EXPOSURE

Release

During formulation of the paint product, the notified polymer is blended with other polymeric paint constituents, filtered and then pumped into 200 L steel drums prior to shipping to the sites of application. The notifier anticipates minimal release of the notified polymer during formulation procedures. The notifier indicates 100 g of Dynoadd F-3 are likely to be lost on the product filters per month, and this filter cake would be placed into landfill. Wash solvent residues would be mixed with other solvent and waste streams and be sent to the solvent recovery unit where all residual polymeric material is recovered and either sent to landfill or is incinerated. The notifier estimates that less than 1 kg per month of the notified polymer would be lost via these routes.

Testing of production batches and rejection of product batches which are below specification are also likely to result in small losses of the notified material.

It is estimated that 0.5 to1.0 kg of the notified polymer may remain in the 20 L drums used for importation of the material. This would be removed during drum reconditioning by licensed drum recyclers, and presumably be also sent to landfill after having been mixed and formed into a crosslinked mass with other polymer residues.

Total losses during reformulation are anticipated to be 2 kg per month, with the released notified polymer either being deposited into landfill or incinerated.

Although the notifier supplied no data, release of the notified polymer during application of the formulated product is expected to be small due to the efficient nature of industrial roller coating processes. Any paint residues and spilled paint are likely to be cured and disposed of into landfill.

Almost all the notified material will eventually be released as a consequence of disposal of the used food cans.

Fate

Release of the notified polymer during application of the formulated product is expected to be small due to the efficient nature of industrial roller coating processes. Any paint residues and spilled paint are likely to cure and be disposed of into landfill.

If sent to landfill leaching will be very slow since the polymer will be incorporated in a crosslinked matrix. Instead it will be subject to the slow abiotic and biotic degradation processes operative in landfills. If incinerated in a furnace the notified material will be destroyed with production of water vapour and oxides of carbon.

Almost all the notified material will eventually be released as a consequence of disposal of the used food cans. These are likely to be placed into landfill or recycled for metal recovery.

The notified material which is lost during reformulation and application will be disposed of into landfill or incinerated. If sent to landfill, since the material is likely to be incorporated within a crosslinked matrix with other waste polymers, leaching is likely to be very slow and the polymer will be subject to the slow abiotic and biotic degradation processes operative in landfills. If incinerated in a furnace the notified material will be destroyed with production of water vapour and oxides of carbon. After the food cans have been used they will be either disposed of into landfill or perhaps recycled for metal recovery. If placed into landfill the coating incorporating the notified polymer is likely to be slowly degraded and destroyed as described above, while if sent for recycling the polymers will be destroyed via incineration.

8. EVALUATION OF TOXICOLOGICAL DATA

No toxicology data were provided, which is acceptable for polymers of NAMW greater than 1 000 according to the Act.

9. ASSESSMENT OF ENVIRONMENTAL EFFECTS

No ecotoxicology data were provided, which is acceptable for polymers of NAMW greater than 1000 according to the Act. Data on the monomer constituents, together with the high molecular weight and water insolubility of the polymer, provides substantial assurance of the likely low toxicological hazard presented by the notified chemical

10. ASSESSMENT OF ENVIRONMENTAL HAZARD

The environmental hazard from the notified polymer is considered to be low.

Only small quantities of the notified polymer are likely to be released during reformulation activity, and in the manufacture of the specialised can coating containing the material. The essentially hydrophobic nature of the polymer is such that if released and disposed of into landfills it is likely to be immobilised through

adsorption onto soil and sediment particles.

Almost all the notified material will be either placed into landfill where it could be expected to be slowly degraded, or otherwise be subject to destruction through incineration.

11. ASSESSMENT OF PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY EFFECTS

Although the information provided for the notified polymer is inadequate to characterise its toxicological hazard, data on the constituent monomers, together with the water insolubility of the polymer, provides substantial assurance of the likely low toxicological hazard presented by the notified chemical. With a number-average molecular weight greater than 1000, the polymer is unlikely to pass biological membranes.

Occupational exposure to the notified polymer is expected to be minimal both in the formulation and application of paints containing this chemical. Since the formulated paint will only be used in industries that produce coated tin cans intended for processed food storage, few workers in the paint application industry are likely to be exposed to the polymer. Furthermore, the low levels of polymer in the paint (~ 1%) will ensure minimal contact for the relatively small number of workers involved in this process.

The public will only come into contact with the notified polymer indirectly through contact with the food cans coated in paints containing the polymer. Once the paint coating has cured, the notified polymer is effectively immobilised in an inert cross-linked polymer matrix. Hence the health effects for the public are expected to be negligible.

12. RECOMMENDATIONS

To minimise occupational exposure to DYNOADD F-3 the following guidelines and precautions should be observed:

- Safety goggles should be selected and fitted in accordance with Australian Standard (AS) 1336 {Standards Australia, 1994 #21} to comply with Australian/New Zealand Standard (AS/NZS) 1337 {Standards Australia/Standards New Zealand, 1992 #23};

- Industrial clothing should conform to the specifications detailed in AS 2919 {Standards Australia, 1987 #18}.

- Impermeable gloves or mittens should conform to AS 2161 {Standards Australia, 1978 #17};

- All occupational footwear should conform to AS/NZS 2210 {Standards Australia/Standards New Zealand, 1994 #24};

- Spillage of the notified chemical should be avoided, spillages should be cleaned up promptly with absorbents which should then be put into containers for disposal;

- Good personal hygiene should be practised to minimise the potential for ingestion;

- A copy of the material safety data sheet (MSDS) should be easily accessible to employees.

13. MATERIAL SAFETY DATA SHEET

The MSDS for Polymer in DYNOADD F-3 was provided in accordance with the *National Code of Practice for the Preparation of Material Safety Data Sheets* {National Occupational Health and Safety Commission, 1994 #13}.

This MSDS was provided by the applicant as part of the notification statement. It is reproduced here as a matter of public record. The accuracy of this information remains the responsibility of the applicant.

14. REQUIREMENTS FOR SECONDARY NOTIFICATION

Under the Act, secondary notification of the notified chemical shall be required if any of the circumstances stipulated under subsection 64(2) of the Act arise. No other specific conditions are prescribed.

15. REFERENCES

1. Standards Australia 1994, *Australian Standard 1336-1994, Eye protection in the Industrial Environment*, Standards Association of Australia, Sydney.

2. Standards Australia/Standards New Zealand 1992, *Australian/New Zealand Standard 1337-1992, Eye Protectors for Industrial Applications*, Standards Association of Australia/Standards Association of New Zealand, Sydney/Wellington.

3. Standards Australia 1987, *Australian Standard 2919-1987, Industrial Clothing*, Standards Association of Australia, Sydney.

4. Standards Australia 1978, *Australian Standard 2161-1978, Industrial Safety Gloves and Mittens (excluding electrical and medical gloves)*, Standards Association of Australia, Sydney.

5. Standards Australia/Standards New Zealand 1994, *Australian/New Zealand Standard 2210-1994, Occupational Protective Footwear*, Standards Association of Australia/Standards Association of New Zealand, Sydney/Wellington.

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