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NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME

FULL PUBLIC REPORT

SPENSOL 3964 POLYMER

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

SPENSOL 3964 POLYMER

1. APPLICANT

A C Hatrick Chemicals Pty Ltd, 49-61 Stephen Rd, Botany, NSW, 2019

2. IDENTITY OF THE CHEMICAL

Based on the nature of the chemical and the data provided, Spensol 3964 polymer is considered to be non-hazardous. Therefore, the chemical identity, molecular and structural formulae, exact molecular weight and manufacturing process have been exempted from publication in the Full Public Report and the Summary Report.

Trade name: Spensol 3964 polymer

Other name: Water dispersible alkyd resin

Number-average molecular weight: > 1000

Maximum percentage of low molecular weight species (molecular weight < 1000): 12.2%

Method of detection and determination:

IR spectrum and fatty acid analysis by methyl ester formation and gas liquid chromatography

3. PHYSICAL AND CHEMICAL PROPERTIES

After manufacture of Spensol 3964 polymer, the solvents 2-butoxyethanol and sec-butyl alcohol are added prior to filtration. Some of the properties listed below are those of the polymer and some are those of the solvent solution, Spensol 3964, and this is indicated as appropriate.

Appearance at 20°C and 101.3 kPa:	pale yellow viscous liquid (polymer) amber viscous liquid (Spensol 3964)
Odour:	vegetable oil-like odour (polymer) characteristic of the dilution solvents (Spensol 3964)
Viscosity:	16 Pa.s at 25°C (Spensol 3964)
Boiling Point:	98-171°C (Spensol 3964)
Density:	1183 kg/m^3 (polymer) 1063.3 kg/m^3 (Spensol 3964)
Flash Point:	36°C (Spensol 3964)
Combustion Products:	combustion of the polymer is expected to produce carbon monoxide and/or carbon dioxide
Reactivity:	expected to be low due to the high molecular weight of the polymer. Degradation expected on contact with oxidising agents.

Comments on the physico-chemical properties:

No data were provided for vapour pressure on the grounds that such a measure for the polymer is "not applicable". The polymer would be expected to have low volatility.

No data were provided for water solubility on the grounds that such a measure for the polymer is "not available". However, the high molecular weight suggests solubility will be insignificant. Alkyd resins are known to generally have very low solubility.

No data were provided for partition coefficient on the grounds that the low expected water solubility makes this measure inappropriate.

No data were provided for hydrolysis on the grounds that the low solubility in water would prevent hydrolysis at neutral pH. The polymer contains a number of hydrolysable ester groups that may be subject to hydrolysis in alkaline conditions, but is unlikely in the environmental pH range.

No data were provided for adsorption/desorption on the grounds that the chemical is not volatile, and being a viscous semi-solid liquid would have low mobility and limited movement to the soil, air and water. This is acceptable.

No data were provided for dissociation constant, as it was claimed not to be applicable to a chemical of this type. The given idealised molecular formula contains no acidic hydrogens.

4. PURITY OF THE CHEMICAL

Degree of purity: >96%

Toxic or hazardous impurity/impurities: None known

Non-hazardous impurities: None known

Maximum content of residual monomers: <4%

Additives/Adjuvants: None

5. INDUSTRIAL USE

The notified chemical is used as a vehicle in industrial paint coatings and is expected to be manufactured at up to 60 tonnes per year over the next five years.

6. OCCUPATIONAL EXPOSURE

The chemical is manufactured in a sealed reactor vessel. The hot resin is pumped from the reaction vessel into a thinning tank containing the solvents (30% by weight being 1:1 2-

butoxyethanol and sec-butyl alcohol). The thinned product is then filtered through a sealed system or one where an extractor is employed over the filter directly into drums prior to sealing.

During manufacture, the only exposure is during sampling. The maximum time of exposure is expected to be 75 minutes in a 24 hour period once per month. Twenty persons will be engaged in filling, sampling and packing operations as well as quality control.

There is no direct contact with the notified chemical during the manufacturing process.

7. PUBLIC EXPOSURE

There is low potential for public exposure to the notified polymer during manufacture, storage, distribution, use and disposal.

8. ENVIRONMENTAL EXPOSURE

. Release

Manufacturing of the polymer solution will take place in a closed reactor. Samples taken from the reactor are recycled back into the reactor. Residues collected in filter bags during the manufacturing process are sent to approved landfills. Spills occurring during drum filling will be contained by bunding on site.

Spensol 3964 is to be transported to other A.C. Hatrick company sites, or to the customers, in 200 L steel drums, by road transport. Details of environmental exposure during paint manufacture are very brief, but is expected to be limited to during sampling and filling operations.

As the chemical itself is not volatile, release to the environment during paint application processes would be of the solvents only. Such discharges would be contained within the paint application area, and would be expected to be collected in the atmosphere scrubber apparatus, or by filters within paint booths at painting plants. Any wastes generated during the painting process will be disposed of in landfill.

A.C. Hatrick estimate that of the 60 tonnes per annum to be ultimately manufactured, 50% of that will be applied by spray application. The company estimated that "an absolute maximum of 7.5 tonnes " could be disposed of to landfill as a result of this process. There is little anticipated waste from dip application as drips would be collected in the tank, which is only likely to be cleaned out annually. The amount of environmental release and waste produced from brush application is less clear. While there will be some release to the aquatic compartment as a result of brush clean-up, this process is only expected to be used for a minor proportion of the imported chemical.

. Fate

On application to landfill the polymer is expected to remain immobile and inert. While the polymer contains ester groups that are theoretically vulnerable to hydrolysis and metabolism, these processes are unlikely under landfill pH conditions due to low solubility. Note the molecular weight of the cured polymer disposed of to landfill is expected to be significantly higher than at manufacture.

The manufacturer states that the resin in the paint formulation when applied is in a form that is not readily susceptible to breakdown in the environment. Incomplete combustion can yield carbon monoxide and toxic vapours of unknown composition.

If the product is exposed to the atmosphere, losses of the additives n-butoxyethanol and sec-butyl alcohol can be expected. Losses by exudation and leaching are not expected.

9. ASSESSMENT OF ENVIRONMENTAL EFFECTS

No ecotoxicological data were provided, which is acceptable for polymers of NAMW > 1000 according to the Act.

10. ASSESSMENT OF ENVIRONMENTAL HAZARD

The polymer is unlikely to present a hazard to the environment when it is incorporated into the paint solution, as further polymerisation is expected to occur as the paint dries, thereby increasing the molecular weight.

The polymer is also unlikely to present a hazard to aquatic organisms due to the low exposure from the end-use application and the polymer's high molecular weight.

The main environmental exposure arises from landfill disposal of approximately 7.5 tonnes waste paint from the spraying process.

Accidental spillage during transport is another possible source of environmental hazard. Both land and aquatic contamination could result. If a land spill occurred, the polymer would bind to the soil and become immobilised. Contaminated soil could then be collected and disposed of in land fill. Spillage into water also should not pose a problem, as the polymer would settle to the bottom of the water body and bind to the sediment. It is unlikely to pose a hazard to aquatic organisms, as its high molecular weight makes transport across biological membranes unlikely.

11. ASSESSMENT OF PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY EFFECTS

To minimise occupational exposure to Spensol 3964 polymer the following guidelines and precautions should be observed:

. if engineering controls and work practices are insufficient to reduce exposure to Spensol 3964 polymer to a safe level, then personal protective devices which conform to and are used in accordance with Australian Standards (AS) for eye protection (AS 1336, AS 1337) (1,2), impermeable gloves (AS 2161) (3) and protective clothing (AS 3765.1, 3765.2) (4,5) should be worn;

. good housekeeping and maintenance should be practised. Spillages should be cleaned up promptly with absorbents which should then be put into containers for disposal in accordance with local or State regulations;

. a copy of the Material Safety Data Sheet should be easily accessible to employees.

13. MATERIAL SAFETY DATA SHEET

The Material Safety Data Sheets (MSDS) for Spensol 3964 polymer and Spensol 3964 (Attachments 1 and 2) were provided in Worksafe Australia format (Ref No:6).

These MSDS were provided by A C Hatrick Chemicals 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 A C Hatrick Chemicals Pty Ltd.

14. REQUIREMENTS FOR SECONDARY NOTIFICATION

Under the *Industrial Chemicals (Notification and Assessment) Act 1989*, as amended (the Act), secondary notification of Spensol 3964 polymer 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. Australian Standard 1336-1982, *Recommended Practices for Eye Protection in the Industrial Environment*, Standards Association of Australia Publ., Sydney, 1982.

2. Australian Standard 1337-1984, *Eye Protectors for Industrial Applications*, Standards Association of Australia Publ., Sydney, 1984.

3. Australian Standard 2161-1978, *Industrial Safety Gloves and Mittens (excluding Electrical and Medical Gloves)*, Standards Association of Australia Publ., Sydney, 1978.

4. Australian Standard 3765.1-1990, *Clothing for Protection Against Hazardous Chemicals, Part 1: Protection Against General or Specific Chemicals*, Standards Association of Australia Publ., Sydney, 1990.

5. Australian Standard 3765.2-1990, *Clothing for Protection Against Hazardous Chemicals, Part 2: Limited Protection Against Specific Chemicals*, Standards Association of Australia Publ., Sydney, 1990.

6. National Occupational Health and Safety Commission, *Guidance Note for the Completion of a Material Safety Data Sheet*, 2nd. edition, AGPS, Canberra, 1990.