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NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME

FULL PUBLIC REPORT

SYNOCURE 899.SA

This Assessment has been compiled in accordance with the provisions of *the Industrial Chemicals (Notification and Assessment) Act 1989,* 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 Human Services and Health.

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

SYNOCURE 899.SA

1. APPLICANT

T.R. (Chemicals Australia) Pty Ltd of 195 Briens Road, Northmead NSW 2152 has submitted a limited notification statement in support of their application for an assessment certificate of Synocure 899.SA

2. IDENTITY OF THE CHEMICAL

Synocure 899.SA is not considered to be hazardous based on the nature of the chemical and the data provided. Therefore the chemical name, CAS number, exact molecular weight and molecular and structural formulae have been exempted from publication in the Full Public Report and the Summary Report.

Trade name: Synocure 899.SA

Number-average molecular weight: > 1000

Maximum percentage of low molecular weight species (molecular weight < 1000): Molecular weight determinations were obtained from two batches. The low molecular weight fraction (<1000) represents less than 0.1% by weight of the polymer.

Method of Detection and Determination

The notified polymer is detected by gas phase chromatography

Spectral data:

Not provided

3. PHYSICAL AND CHEMICAL PROPERTIES

The following data refer to the product containing approximately 60% of the notified chemical and 40% butyl acetate.

Appearance at 20°C and 101.3 kPa:	Clear 'water white' to yellow liquid
Odour:	Of butyl acetate (threshold 7 ppm)
Boiling Point:	120-129°C
Density:	1020 at 20°C
Vapour Pressure:	Not provided
Water Solubility:	Not provided

Partition Co-efficient (n-octanol/water) log P_{OW}:	Not provided
Hydrolysis as a function of pH:	Not provided
Adsorption/Desorption:	Not provided
Dissociation Constant pKa**:**	Not provided
Flash Point:	24°C open cup
Flammability Limits:	Combustible and may emit toxic fumes and acrid smoke.
Combustion Products:	Carbon Monoxide Carbon Dioxide Aldehydes
Autoignition Temperature:	Not determined
Explosive Properties:	Not explosive
Reactivity:	Will react with acid functional resins releasing heat and possible emission of acid fumes containing oxides of carbon and formaldehyde.
Particle size distribution:	Not applicable

Comments on physico-chemical properties:

Specific data for the polymer are not available. Properties of the solution are those of butyl acetate.

The polymer itself would be expected to have low water solubility and low vapour pressure. Low water solubility was confirmed by removing the butyl acetate solvent, heating under reflux for 6 hours in water, setting aside for 120 hours at room temperature, and evaporating the water. The solubility obtained (0.14%) is considered an overestimate as it would include residues from hydrolysis of the polymer.

The polymer contains no dissociable groups. The epoxy-functionality reacts with acid functional groups (hence the use as a cross linking agent) and is also susceptible to hydrolysis, as indicated by the solubility determination.

4. PURITY OF THE CHEMICAL

Degree of purity : > 99%

Toxic or hazardous impurity/impurities:

. **Chemical name:** 2-Ethylhexylmethacrylate
CAS No.: 688-84-6
Weight percentage: 0.30%

. **Chemical name:** 1,3-Dichloro-2-propanol
CAS No.: 96-23-1
Weight percentage: 0.20%

. **Chemical name:** Glycidyl methacrylate
CAS No.: 106-91-2
Weight percentage: 0.01%

. **Chemical name:** Chloro-propane-1,3-diol
CAS No.: 1331-07-3
Weight percentage: 0.01%

Additives/Adjuvants: None

5. INDUSTRIAL USE

Synocure 899.SA is an epoxy copolymer curing agent which will be used with the CRAY VALLEY range of acid functional acrylic resins. The combination produces isocyanate free two pack coating systems for long lasting vehicle refinishing and general maintenance enamels.

Synocure 899.SA will be imported from Cray Valley Limited UK in annual volumes of 5-10 tonnes initially, increasing to 30-50 tonnes after 5 years. Import volumes are relatively low for this market segment, reflecting performance and cost factors.

6. OCCUPATIONAL EXPOSURE

The notified polymer will be imported in 200 litre closed head drums.

Categories of workers potentially exposed to the polymer include storeman, repackers, blenders and spray painters.

Blenders (up to 1000) would be involved working the Synocure 899.SA with the acrylic resin prior to spray painting procedures, this is usually carried out by the spray painter.

Re-packing would expose the operators to fumes, which would comprise essentially of butyl acetate. This would involve an estimated 5 hours per day per operator for 220 days per year. Blending and spray painting personnel would be involved for a similar period.

Paint application will be conducted in spray booths equipped with exhaust ventilation and filtering systems.

7. PUBLIC EXPOSURE

Public exposure to the notified polymer is expected to be negligible. It will be distributed in vehicles licensed and identified to carry Class 3 flammable goods. No public exposure to the notified polymer is expected to occur during repacking, storage or the distribution of Synocure 899SA.

Prior to use, Synocure 899SA will be blended with 'non-isocyanate acrylic coating systems' and will constitute 15% of the final blend. Given that no vapours of the notified polymer are expected to occur and that spraying procedures will be conducted in spray booths equipped with exhaust ventilation and filtering systems, no public exposure to the notified polymer is expected to occur during blending or spraying procedures.

8. ENVIRONMENTAL EXPOSURE

. Release

Synocure 899SA will be repacked directly from 200 L steel drums to smaller packs, with estimated loses of 20-30 g per drum. Repackaging will occur at two sites. Synocure 899SA will be blended at approximately 15% of the finished coating with acid functional acrylic polymers prior to use.

Spills will be absorbed using sand or sawdust before disposal to landfill. Estimated losses are 6 kg polymer per tonne of solution.

Waste from spray painting operations is generally collected by aqueous scrubbing and filtration, and disposed of to landfill.

Synocure 899SA will be applied as a spray by the above two companies and numerous vehicle refinishers. Major users will apply the coating in spray booths equipped for filtration of overspray, which is expected to represent 5-20% of applied (up to 10 tonnes per annum at product maturity). Waste resin recovered by filtration from spray painting operations will be consigned to landfill. Alternatively, overspray may be collected on protective paper and disposed of to landfill or by incineration.

. Fate

Synocure 899SA will mainly be disposed of to landfill as residues from spray painting operations. Like other acrylic polymers, it is expected to have minimal mobility in the environment because of its high molecular weight, low water solubility and low vapour pressure. Residues consigned to landfill will remain immobile. Incineration of residues collected on protective paper will result in their destruction.

9. EVALUATION OF TOXICOLOGICAL DATA

Toxicological data are not required for polymers of number-average molecular weight (NAMW) > 1000 according to the *Industrial Chemicals (Notification and Assessment) Act, 1989* and no data were submitted for the notified polymer.

10. ASSESSMENT OF ENVIRONMENTAL EFFECTS

Environmental effects testing is not required for high molecular weight acrylic resins. Acrylic polymers with molecular weight above 1000 are too large to cross biological membranes.

11. ASSESSMENT OF ENVIRONMENTAL HAZARD

Like other acrylic polymers, Synocure 899SA is expected to present a negligible hazard to the environment because of its lack of mobility and inability to cross biological membranes. The US EPA considers polynonionic polymers with molecular weights above 1000 to be of low concern (4). The use of Synocure 899SA will result in its encapsulation in a durable and inert cross-linked acrylic resin of negligible environmental hazard.

12. ASSESSMENT OF PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY EFFECTS

No toxicological data were submitted for the new polymer. However, as the notified polymer has a number-average molecular weight (NAMW) > 1000, it is unlikely to pass biological membranes and cause systemic effects. The polymer contains a number of hazardous impurities. These are present at levels well below the cut-off concentrations necessary to classify the polymer as a hazardous substance (5) and are therefore not expected to cause any significant toxicological concerns. The polymer also contains low levels of low molecular weight species (~0.1% < 1000). At these levels, any toxicological hazards associated with the low molecular weight component of the polymer should be minimal.

The notified polymer will arrive in Australia as a 60% component in 40% butyl acetate. As the polymer is available in liquid form, skin and eye contact will be the main sources of occupational exposure during paint preparation, equipment loading and equipment cleaning. Inhalational exposure during these activities is unlikely as the polymer vapour pressure is expected to be low at room temperature. Inhalational exposure during paint application, however, will be significant as the spray process will generate aerosols.

The applicant has stated that a number of engineering controls and personal protective devices will be used to limit exposure. The use of a well ventilated spray booth for spray applications will reduce worker exposure to overspray. Exposure to overspray will be further reduced by the wearing of respiratory protection. The use of overalls, gloves and eye protection will reduce worker exposure in the event of splashings and spillages. Therefore, worker exposure to the notified chemical should be low when the paint product is used in the proposed manner.

No public exposure to the notified polymer is expected to occur.

13. RECOMMENDATIONS

To minimise occupational exposure to Synocure 899SA the following guidelines and precautions should be observed:

- if engineering controls and work practices are insufficient to reduce exposure to a safe level, then the following personal protective devices should be worn:
  - impervious gloves conforming to Australian Standards (AS) AS 2161 (6),
  - protective eye goggles conforming to AS/NZS 1337 (1),
  - protective clothing conforming to AS 2919 (7), and
  - protective footwear conforming to AS/NZS 2210 (8).
- if aerosols are generated, and engineering controls are not sufficient to control exposure, the following protective equipment should also be worn:
  - air purifying respiratory protection conforming to AS/NZS 1715 (2).
- a copy of the Material Safety Data Sheet (MSDS) should be easily accessible to employees.
- well ventilated spray booths with local exhaust ventilation should be used for spray application where necessary

14. MATERIAL SAFETY DATA SHEET

The attached MSDS for Synocure 899SA was provided in suitable format.

This MSDS was provided by T.R. (Chemicals Australia) 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 T.R. (Chemicals Australia) Pty Ltd.

15. REQUIREMENTS FOR SECONDARY NOTIFICATION

Under the *Industrial Chemicals (Notification and Assessment) Act 1989*, secondary notification of Synocure 899SA shall be required if any of the circumstances stipulated under subsection 64(2) of the Act arise. No other specific conditions are prescribed.

16. REFERENCES

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

2. Standards Australia, Standards New Zealand 1994, Australia/New Zealand Standard 1715-1994, *Selection, Use and Maintenance of Respiratory Protective Devices*, Standards Association of Australia Publ., Sydney, Australia, Standards Association of New Zealand Publ., Wellington, New Zealand.

3. Standards Australia, Standards New Zealand 1991, Australia/New Zealand Standard 1716-1991, *Respiratory Protective Devices*, Standards Association of Australia Publ., Sydney, Australia, Standards Association of New Zealand Publ.,. Wellington, New Zealand.

4. J V Nabholz, P Miller and M Zeeman, "Environmental Risk Assessment of New Substances under the Toxic Substances Control Act Section Five", pp 40-55 in W G Landis, J S Hughes and M A Lewis (Eds), *Environmental Toxicology and Risk Assessment*, American Society for Testing and Materials, ASTM STP 1179, Philadelphia, 1993.

5. National Occupational Health and Safety Commission, Approved Criteria for Classifying Hazardous Substances. Australian Government Publishing Service, Canberra, 1994.

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

7. Standards Australia. 1987, Australian Standard 2919-1987 Industrial Clothing, Standards Association of Australia Publ., Sydney, Australia

8. Australian/New Zealand Standard 2210-1994, Occupational Protective Footwear. Standards Association of Australia, Standards Association of New Zealand, 1994.