

File No: NA/222

Date: December 20, 1994

**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION
AND ASSESSMENT SCHEME**

FULL PUBLIC REPORT

ACRYLIC RESIN X190-430

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
ACRYLIC RESIN X190-430

1. APPLICANT

Dulux Australia of McNaughton Rd, Clayton VIC 3168 have submitted a limited notification for the assessment of Acrylic resin X190-430.

2. IDENTITY OF THE CHEMICAL

Based on the nature of the chemical and the data provided Acrylic resin X190-430 is considered to be non-hazardous. Therefore, the chemical identity, spectral data, composition, impurities and molecular weight have been exempted from publication in the Full Public Report and the Summary Report.

**Chemical Abstracts Service
(CAS) Registry No.:**

Not available

Other name:

Acrylic resin X190-430

Methods of detection and determination:

Infrared spectroscopy, Gel Permeation Chromatography, Gas Chromatography - Mass Selective Detection.

3. PHYSICAL AND CHEMICAL PROPERTIES

The polymer is manufactured in a 50 % solvent solution and is never isolated. For this reason much of the information on the physical and chemical properties of the notified chemical was unavailable.

Appearance at 20°C and 101.3 kPa:	Polymer solution is a viscous, clear liquid with a solvent odour.
Melting Point/Boiling Point:	Unknown; the polymer solution is expected to boil initially at the boiling point of iso-butanol at 106°C.
Specific Gravity:	Calculated to be 0.932; the specific gravity for the polymer solution is 0.889.
Vapour Pressure:	Not expected to be volatile; the polymer solution is expected to have the vapour pressure of the constituent solvents eg. xylene 1.2 kPa at 20°C
Water Solubility:	Expected to be insoluble in water.
Fat Solubility:	Not provided
Partition Co-efficient	Not provided
Hydrolysis as a function of pH:	Not expected to hydrolyse.

Adsorption/Desorption:	Not measured. As the solvent evaporates from the polymer solution it will become more sticky and viscous and will readily bind to soil thus becoming immobilised.
Dissociation Constant:	Not measured; as the polymer is not expected to be water soluble this is probably inapplicable.
Flash Point:	Not available; The polymer solution will have a flash point of xylene ie 27°C.
Flammability Limits:	Not available. The polymer solution is expected to have limits of its constituent solvents eg xylene 1-7%.
Combustion Products:	Not provided
Decomposition Products:	The polymer is stable and not expected to hydrolyse.
Autoignition Temperature:	Not available. The polymer solution will have an autoignition of its solvents eg. xylene 500°C
Explosive Properties:	Not available. The polymer solution is expected to have explosive properties of the solvents which will form explosive mixtures with air.
Reactivity/Stability:	The polymer and its solution are expected to be stable but like all organic compounds should be segregated from strong oxidising compounds.
Particle size distribution:	Not applicable as the polymer will always be in solution.

Comments on physico-chemical properties:

The polymer contains a number of ester linkages but hydrolysis in the environmental pH range would be precluded by low solubility. The polymer also contains a small amount of free carboxylic acid, expected to have typical acidity.

4. PURITY OF THE CHEMICAL

Degree of purity: 99.31 %

5. INDUSTRIAL USE

Acrylic resin X190-430 will be manufactured in Australia. It will not be used in Australia but will be produced for export after which it will be used in an industrial coating. Dulux reports that no incidences of adverse health effects have been reported to have occurred as a result of the polymer.

6. OCCUPATIONAL EXPOSURE

Approximately 50 tonnes of Acrylic resin X190-430 is expected to be manufactured during the first year and 50 - 200 tonnes per year for the subsequent four years.

Manufacturing will be performed at a single site at Clayton, Victoria. The reactants and solvents will be charged to a closed reaction vessel for polymer formation. The product will then be filled into drums and stored for export.

The monomers used in large quantities will be pumped directly from bulk storage tanks and metered into the reaction vessel. The weight and volume of the monomers will be cross checked by the vessel meter. Monomers used in small volumes will be pumped from drums. These drums are normally bunged and will be uncapped and then lanced to allow withdrawal of the monomer via a pump. After use, the drum is resealed and capped. After the reaction is complete and the polymer has been formed the polymer is filtered and the 200L drums are filled semiautomatically. There is a small risk of spillage at this point. The removal of monomers from their drums and drum filling are both conducted under exhaust ventilation.

Sampling, testing and reactor charging is expected to involve 9 workers for a maximum of 8 hours per day, 10 days per year.

There will be no further occupational exposure as the polymer will not be used in Australia.

7. PUBLIC EXPOSURE

The potential for public exposure to the notified chemical during manufacturing processes is negligible. Accidental release from the manufacturing site will be prevented by engineering controls, and waste material will be disposed of by landfill. In the event of a transport accident, Acrylic resin X190-430 is expected to exhibit very low mobility due to its low vapour pressure and solubility in water.

8. ENVIRONMENTAL EXPOSURE

There is potential for spillage of the polymer solution when filling. However, the spill would be contained at the plant through existing bunding. Some waste will be generated on the production of the polymer. Dulux has developed a method from which waste resin and paint can be processed to reclaim solvents. The residue is converted to an inert solid and disposed of to landfill, although incineration is an option. This process currently meets local statutory requirements. The company has estimated that up to 2000 kg (1%) of waste polymer could be disposed of in this manner.

9. EVALUATION OF TOXICOLOGICAL DATA

No toxicity data were provided which is acceptable according to the *Act* for a polymer of Number Average Molecular Weight (NAMW) > 1000.

10. ASSESSMENT OF ENVIRONMENTAL EFFECTS

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

Due to its high NAMW the polymer is not expected to cross biological membranes.

11. ASSESSMENT OF ENVIRONMENTAL HAZARD

The polymer is being produced for export, with the main release to the Australian environment through disposal of residue at landfill. While this amounts to a significant amount (1% of polymer produced), the residue is converted to an inert solid. Further, the polymer is likely to bind to soil as solvent evaporates. Therefore, it is considered that the polymer does not pose a significant hazard to the environment.

12. ASSESSMENT OF PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY EFFECTS

Acrylic resin X190-430 is a high molecular weight polymer with expected low volatility and low reactivity. Due to its high molecular weight it is unlikely to cross biological membranes and its low volatility suggests that it will not be easily inhaled.

The method of manufacture, using automated techniques, will result in few opportunities for the exposure of workers to the notified chemical. Also, the actual time of worker involvement with the new polymer is limited to 10 days per year for 9 workers. Drum filling is the only activity where exposure is possible and is most likely to be in the form of skin or eye contact resulting from splashes or spills.

Precautions are taken to avoid contact with the volatile solvents in which the polymer is made. These include air monitoring and the use of exhaust ventilation and are expected to be adequate to deal with any possible hazard of the polymer.

In light of the use pattern and the limited physico-chemical data the risk to the health of the public and those who work with the notified chemical and is expected to be minimal.

13. RECOMMENDATIONS

To minimise occupational exposure to Acrylic resin X190-430 the following guidelines and precautions should be observed:

- . If engineering controls and work practices are insufficient to significantly reduce exposure to a safe level, then personal protective devices which conform to and are used in accordance with Australian Standards (AS) for chemical goggles (AS 1336; AS 1337) (2,3), impermeable gloves (AS 2161) (4) and overalls should be worn,
- . good work practices should be implemented to avoid splashing or spillages,
- . good personal hygiene should be adopted,
- . a copy of the Material Safety Data Sheet (MSDS) for products containing Acrylic resin X190-430 should be easily accessible to employees.

14. MATERIAL SAFETY DATA SHEET

The attached MSDS for Acrylic resin X190-430 was provided in Worksafe Australia format (5).

This MSDS was provided by Dulux Australia 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 Dulux Australia.

15. REQUIREMENTS FOR SECONDARY NOTIFICATION

Under the *Industrial Chemicals (Notification and Assessment) Act 1989*, secondary notification of Acrylic resin X190-430 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. Commonwealth Environment Protection Agency, 1992, The Australian Inventory of Chemical Substances Vol 1, 1st ed.
2. Standards Australia, 1982. Australian Standard 1336-1982, *Eye Protection in the Industrial Environmental*, Standards Association of Australia Publ., Sydney.
3. Standards Australia, 1984. Australian Standard 1337-1984, *Eye Protectors for Industrial Applications*, Standards Association of Australia Publ., Sydney.
4. Standards Australia, 1978. Australian Standard 2161-1978, *Industrial Safety Gloves and Mittens (excluding Electrical and Medical Gloves)*, Standards Association of Australia Publ., Sydney.
5. Worksafe Australia, March 1994, *National Code of Practice for the Preparation of Material Safety Data Sheets* [NOHSC:2011(1994)], Australian Government Publishing Service, Canberra.