

File No: PLC/95

January 1999

**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION
AND ASSESSMENT SCHEME**

FULL PUBLIC REPORT

Ucecryl R290

This Assessment has been compiled in accordance with the provisions of the *Industrial Chemicals (Notification and Assessment) Act 1989* (the Act) and Regulations. This legislation is an Act of the Commonwealth of Australia. The National Industrial Chemicals Notification and Assessment Scheme (NICNAS) is administered by the National Occupational Health and Safety Commission which also conducts the occupational health & safety assessment. The assessment of environmental hazard is conducted by the Department of the Environment and the assessment of public health is conducted by the Department of Health and Aged Care.

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, National Occupational Health and Safety Commission, 92-94 Parramatta Road, Camperdown NSW 2050, between the following hours:

Monday – Wednesday	8.30 am - 5.00 pm
Thursday	8.30 am - 8.00 pm
Friday	8.30 am - 5.00 pm

Copies of the full public report may also be requested, free of charge, by contacting the Administration Coordinator.

Please direct enquiries or requests for full public reports to the Administration Coordinator at:

Street Address: 92 Parramatta Road, CAMPERDOWN NSW 2050, AUSTRALIA
Postal Address: GPO Box 58, SYDNEY NSW 2001, AUSTRALIA
Telephone: (61) (02) 9577 9514
Facsimile: (61) (02) 9577 9465

Director
Chemicals Notification and Assessment

FULL PUBLIC REPORT**Ucecryl R290****1. APPLICANT**

UCB Chemicals of 240 Huntingdale Rd, HUNTINGDALE VIC 3167 has submitted a limited notification statement in support of their application for an assessment certificate for Ucecryl R290.

2. IDENTITY OF THE CHEMICAL

Chemical Name: 2-propenoic acid, 2-methyl, butyl ester, polymer with 2-ethylhexyl-2-propenoate and ethyl-2-propenoate

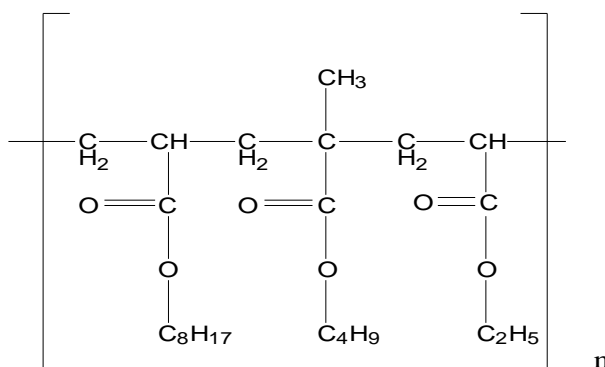
Chemical Abstracts Service (CAS) Registry No.: 170778-73-1

Other Names: butyl methacrylate, polymer with 2-ethylhexyl acrylate and ethyl acrylate

Trade Name: Ucecryl R290

Molecular Formula: $(C_8H_{14}O_2)_a(C_{11}H_{20}O_2)_b(C_5H_8O_2)_c$

Structural Formula:



Number-Average Molecular Weight (NAMW): > 28090 g/mol (GPC; polydispersity = 2.42)

Maximum Percentage of Low

Molecular Weight Species**Molecular Weight < 500:** < 2 %**Molecular Weight < 1 000:** < 5 %**Weight Percentage of
Ingredients:**

<i>Chemical Name</i>	<i>CAS No.</i>	<i>Weight %</i>
2-propenoic acid, 2-ethylhexyl ester	103-11-7	81 %
2-propenoic acid, ethyl ester	140-88-5	11 %
2-propenoic acid, 2-methyl, butyl ester	97-88-1	6 %
2-propenamamide	79-06-1	1 %
2-propenoic acid	79-10-7	1 %

• Due to the low content of the last two components they were not included in the structural formula.

**Method of Detection
and Determination:**

IR spectroscopy

Spectral Data:2959, 2931, 2873, 2860, 1736, 1462, 1380, 1258, 1166,
1110, 1031, 959, 908, 856, 770, 728, 619 cm⁻¹

The polymer was produced by emulsion polymerisation and is characterised by a very high molecular weight and low solubility in all solvents used for Gel Permeation Chromatography measurements. The number average molecular weight is underestimated and the percentage of low molecular weight species is overestimated as the fraction of the polymer soluble in THF (< 3 %) which was used for the GPC analysis will contain only the lower molecular weight species.

3. PHYSICAL AND CHEMICAL PROPERTIES

The polymer Ucecryl R290 is produced by emulsion polymerisation and is never isolated from water. The physical and chemical properties listed below are for the aqueous emulsion.

**Appearance at 20°C
and 101.3 kPa:**

milky liquid

Melting Point:

not applicable

Specific Gravity:

ca 1.03 g/mL

Water Solubility:

< 1 mg/L at 25°C, emulsion is completely miscible with water

Dissociation Constant:

the polymer does not contain any acidic or basic

functional groups which will dissociate in the normal environmental pH range

Flash Point:	not applicable
Flammability Limits:	not applicable
Autoignition Temperature:	not applicable
Explosive Properties:	no explosive properties are expected
Reactivity/Stability:	the polymer will be stable under normal environmental conditions

Comments on Physico-Chemical Properties

Meaningful data for the notified substance is difficult to obtain as the polymer is formulated and stored dispersed in water (36%), and when dried forms a viscous non-reactive matrix with strongly adhesive properties.

The polymer emulsion is completely miscible with water. The polymer is stated to be not soluble in water as it exhibits hydrophobic activity. Very low water solubility would be expected on the basis of the presence of a substantial number of very hydrophobic groups.

The notified substance does contain a number of ester functionalities which are theoretically hydrolysable but this would be precluded by the very low solubility.

4. PURITY OF THE CHEMICAL

Degree of Purity:	56.8 %
Maximum Content of Residual Monomers:	250 ppm

Additives/Adjuvants:

<i>Chemical name:</i>	water
<i>Weight percentage:</i>	35.9 %

Chemical name: D-glucopyranose, oligomeric, C₁₀₋₁₆ alkyl glycosides
Synonyms: Simulsol SL 26
CAS No.: 110615-47-9
Weight percentage: 3.65 %

Chemical name: Poly(oxy-1,2-ethanediyl), -sulpho, -nonylphenoxy, sodium salt, 35 % in water
Synonyms: Rewopol NOS 10
CAS No.: 9014-90-8
Weight percentage: 1.91 %

Chemical name: phosphoric acid, dodecyl ester, potassium salt
Synonyms: Standapol 1014/4
CAS No.: none
Weight percentage: 1.44 %

Chemical name: sodium carbonate
Synonyms: soda ash
CAS No.: 497-19-8
Weight percentage: 0.16 %

Chemical name: 5-chloro-2-methyl-2H-isothiazol-3-one, mixture with 2-methyl-2H-isothiazol-3-one, 3:1
Synonyms: Biocide K10
CAS No.: 26172-55-4 and 2682-20-4
Weight percentage: 0.11 %

Chemical name: Combination of fatty acid addition products and alkane hydrocarbons
Synonyms: Struktol SB2066
CAS No.: none
Weight percentage: 0.06 %

5. USE, VOLUME AND FORMULATION

The notified polymer will be used as a pressure sensitive adhesive for self adhesive labels where easy removal and repositioning are required. The polymer will not be manufactured in Australia. Approximately 50 tonnes per year will be imported for the first 5 years.

The product is imported as an emulsion which is mixed with other components to produce a pressure sensitive adhesive emulsion. The imported emulsion containing the notified polymer comprises 90-95 % of the mixed adhesive. The emulsion is applied to the labels in a coating machine and then passed through a drying oven to produce a solid coating of adhesive on the paper. A typical application would contain 17 g/m² of the notified substance. A layer of silicone release paper is then laminated on to the coated labels. The finished product will normally be used in packaging plants to label plastic or glass containers.

Labels are then packaged and sold to customers who apply them to their products. Adhesive remaining in the coating machine is returned to the bulk tank at the end of the day.

6. OCCUPATIONAL EXPOSURE

The emulsion of the notified polymer will be imported in 216 L polyethylene lined metal drums. The drums will be unloaded and transported to a bunded storage facility at the customer site. The worker exposure involved in unloading the product at the wharf and transporting the drums to the customer site is not documented by the notifier. As the volume of material is not large and it is transferred in sealed drums, the exposure of these workers should be slight except in the case of an accidental spillage.

The drums on pallets will be unloaded by forklift at the customer site. One worker will be involved in the unloading and another worker will maintain the storage area. The emulsion will be transferred by pump from the drums to a mixing vessel where the adhesive is compounded. The product is then transferred to 1000 L containers. Two workers will be involved in the mixing process. The emulsion containing the notified polymer has very low volatility and high viscosity, and vapours and aerosols are unlikely to be formed. Therefore the most likely route of exposure is dermal. Exposure to drips may occur on connecting and disconnecting transfer hoses.

The 1000 L containers will be transferred by forklift to the coating machine. The emulsion will be pumped into the machine where it is spread onto the labels and passed to a drying oven to remove water; any excess adhesive will be pumped back into the 1000 L containers. The dried adhesive layer is then covered with a silicone backing paper. Four workers will be involved in the first step, and three in the second. The transfer of the emulsion to and from the coating machine is another possible opportunity for dermal exposure.

The finished labels will be used industrially in a number of packaging plants, where dermal

contact with the dried adhesive is possible.

The MSDS indicates that workers exposed to the polymer emulsion should wear protective glasses and gloves.

7. PUBLIC EXPOSURE

The notified polymer in emulsion form is used only in an industrial environment. The potential for public exposure to the notified polymer arising from reformulation, waste disposal and transport is negligible.

The polymer in dried form is used as the adhesive on labels for consumer products. The labels typically contain 18 g adhesive/m² paper and the notified polymer represents 90-95 % of the adhesive content. The labels will be used for labelling packaging materials, e.g. glass or plastic containers where the label is required to be removed after some period of time. Extensive public exposure may be expected with a product of this type.

8. ENVIRONMENTAL EXPOSURE

Release

Release to the environment could occur through spillage in transport and in the mixing and application process. Levels of these would be very low. The customer has supplied all relevant data on the bunded storage and mixing facilities as well as procedures for spillage control and cleanup. Application machinery area drainage is protected by an interceptor and settling pit. A Trade Waste agreement exists with the relevant authority for the correct treatment and release of effluent from the factory and compound.

Fate

The notified substance on release to the environment could be expected (on drying) to adhere to a solid surface and remain in situ. In the natural water fraction the polymer would attach to sediment and suspended solids and become immobilised.

The labels containing the notified substance would share the fate of the article to which it was affixed. If incinerated it would produce oxides of carbon and hydrogen. If disposed in landfill it would fix to the organic fraction in the soil.

9. EVALUATION OF TOXICOLOGICAL DATA

Ucecryl R290 has been notified as a Polymer of Low Concern. Polymers which satisfy the criteria for this category are unlikely to have significant toxic effects because of the high

molecular weight and the absence of reactive functional groups. For this reason toxicological studies are not required as part of the notification process.

10. ASSESSMENT OF ENVIRONMENTAL EFFECTS

No ecotoxicological data were provided which is acceptable for polymers of low concern with a NAMW > 1000 according to the *Industrial Chemicals (Notification and Assessment) Act*.

11. ASSESSMENT OF ENVIRONMENTAL HAZARD

The notified polymer is not likely to present a hazard to the environment when it is transported, stored and used in the proposed manner.

There will be limited release to the environment during formulation and use. The main environmental hazard would arise through spillage in transport accidents that may release small quantities of the suspended polymer to drains and waterways. However, the polymer would quickly become immobile on association with soil/sediment layer. The high molecular weight would also not allow the notified substance to cross biological membranes.

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

12. ASSESSMENT OF PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY EFFECTS

The polymer is an acrylic polymer of high molecular weight and without reactive functional groups. This class of polymer is generally considered to be of low hazard. Polymers of high molecular weights and low water solubility do not readily cross biological membranes. The most probable route of exposure to Ucecryl R290 is dermal exposure to drips of the emulsion, or to dried polymer film. Neither type of exposure is expected to pose a significant risk. The exposure of packaging workers to the dried adhesive film is also not expected to produce significant risk.

The MSDS indicates that workers exposed to the polymer emulsion should wear protective glasses and gloves.

There is likely to be extensive public exposure to the notified chemical through contact with the end use product, however the physico-chemical characteristics and end use pattern of the polymer should be sufficient to preclude absorption across the skin or other biological membranes. It is therefore considered that the notified polymer will not pose a significant hazard to public health.

13. RECOMMENDATIONS

To minimise occupational exposure to Ucecryl R290 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) to comply with Australian/New Zealand Standard (AS/NZS) 1337 (Standards Australia/Standards New Zealand, 1992);
- Industrial clothing should conform to the specifications detailed in AS 2919 (Standards Australia, 1987) and AS 3765.2 (Standards Australia, 1990);
- Impermeable gloves or mittens should conform to AS 2161 (Standards Australia/Standards New Zealand, 1998);
- All occupational footwear should conform to AS/NZS 2210 (Standards Australia/Standards New Zealand, 1994);
- 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 MSDS should be easily accessible to employees.

14. MATERIAL SAFETY DATA SHEET

The MSDS for the notified chemical 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).

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.

15. 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.

16. REFERENCES

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.

Standards Australia (1987) Australian Standard 2919-1987, Industrial Clothing. Standards Association of Australia, Sydney.

Standards Australia (1990) Australian Standard 3765.2-1990, Clothing for Protection against Hazardous Chemicals Part 2 Limited protection against specific chemicals. Standards Association of Australia, Sydney.

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

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.

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.

Standards Australia/Standards New Zealand (1998) Australian/New Zealand Standard 2161.2-1998, Occupational protective gloves, Part 2: General requirements. Standards Association of Australia/Standards Association of New Zealand, Sydney/Wellington.