File No: **NA/26**

Date: 4 February 1992

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME

FULL PUBLIC REPORT

URALAC CP 1090 SN

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 Arts, Sport, the Environment and Territories and the assessment of public health is conducted by the Department of Health, Housing 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 8.30 am and 6.00 pm Monday - Thursday and between the hours of 8.30 am and 5.00 pm Friday except on public holidays.

Please find enclosed order form for Full Public Reports.

For Enquiries please contact Ms Mai Le at:

Street Address: 92 Parramatta Rd Camperdown, NSW 2050, AUSTRALIA
Postal Address: GPO Box 58, Sydney 2001, AUSTRALIA
Telephone: (61) (02) 565-9466 **FAX (61) (02) 565-9465**

Director
Chemicals Notification and Assessment

FULL PUBLIC REPORT

URALAC CP 1090 SN

1. IMPORTER

Robert Decker & Co Pty Ltd, 68 Alexander St, Crows Nest, NSW, 2065.

2. IDENTITY OF THE CHEMICAL

Marketing Name: Uralac CP 1090 SN

Other Names: saturated polyester resin; oilfree alkyd

Molecular Weight: The number average molecular weight was demonstrated to be about 4000 by gel permeation chromatography.

Uralac CP 1090 SN is classified as a non-hazardous chemical to humans because polymers with a molecular weight of >1000 are unlikely to be able to cross bioligical membranes. For this reason, the chemical name, Chemical Abstract Registry Number (CAS No.:) and the molecular and structural formulae have been exempted from publication.

3. PHYSICAL AND CHEMICAL PROPERTIES

At room temperature and atmospheric pressure, the polymer in Uralac CP 1090 SN is a clear, yellowish, solid resin. Uralac CP 1090 SN is imported as a solution in xylene and as such is a clear, yellowish, viscous liquid.

Specific gravity: 1,100 kg/m^3 (30% xylene solution)

Glass transition temperature: 17°C

Thermal decomposition products:	water vapour and oxides of carbon under extreme heat. At temperatures above 150°C, the polyester degrades to its original components.
Reactivity:	the OH groups can react at temperatures above 100°C with COOH groups and NCO groups.

Comments on Physico-Chemical Properties

Data on Flash point, Flammabilty limits, Autoignition temperature and Explosive properties are not required for a polymer of this type.

No data were provided for vapour pressure and water solubility on the grounds that "The solubility of polyesters in water under normal conditions is very low". The literature supports that polyesters of this type are highly insoluble and difficult to hydrolyse.

No data were provided for partition coeffient, adsorption/desorption and dissociation constant on the grounds that the polymer is insoluble in water. The high molecular weight of the polymer is likely to prevent it from crossing biological membranes and the partition coefficient test would be difficult to perform and interpret. The molecular weight of the polymer and its expected water insolubility suggests the polymer is likely to be immobile in soil. Again measurement and interpretation of a result for this property would be difficult due to the complexity of this substance. The polyester, due to its nature, is unlikely to dissociate.

4. METHOD OF DETECTION AND DETERMINATION

Infrared spectroscopy is used to detect the polymer in Uralac CP 1090 SN.

5. PURITY OF THE CHEMICAL

Degree of purity of polymer: 100% w/w polymeric material

Amount of polymer in Uralac CP 1090 SN: 70%

6. INDUSTRIAL USE

Uralac CP 1090 SN is used in paints for coating steel, and is mixed with pigments and other additives prior to being cured to

produce a pigmented film on coils of steel for use in the building industry.

The estimated quantity to be imported is 50 tonnes per year for the next five years.

7. OCCUPATIONAL EXPOSURE

Uralac CP 1090 SN is delivered direct from the carrying ship to a paint manufacturer. The paint is then transported to a coil coating factory where it is applied to metal by a roller-coater and cured in a hot air convection oven.

At the paint manufacturing plant, closed drums are transported by fork lift from the storage area to the production area. A mechanical device tilts the drum and pours the resin through the bung into the mixer. After the manufacturing process has been completed, the finished product is strained and pumped into overhead drums which are then sealed manually with lids. As the mixing related to the manufacturing process involves the emission of vapours, control of these vapours is achieved through dust/vapour extraction hoods located at all primary mixing points. Further control of the emission of vapour following completion of the batch is by the use of lids to cover the mixing tanks once these are removed from the mixer. It is expected that these controls would minimise exposure to Uralac CP 1090 SN as well as solvent vapours.

At the coil coating plant, the lid of the drum is replaced by a device resembling a drum lid with a mixer attached. The paint is mechanically mixed and pumped into the tray that feeds the coating line. All solvents emitted during the baking process are passed through scrubbers and after-burners. Any evaporation of solvents on the roll coater application is minimised by two complete changes of air in the area every hour. These containment practices which are in place to minimise exposure to solvent would also be expected to minimise exposure to the polymer.

8. PUBLIC EXPOSURE

Under normal circumstances, public exposure to liquid Uralac CP 1090 SN would be very low since its use is confined to a small number of industrial sites. Exposure via coated steel products

may occur but is unlikely to present any significant risk because the polymer will be in the form of an inert solid resin.

9. ASSESSMENT OF PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY EFFECTS

The polymer component of Uralac CP 1090 SN has a high molecular weight (>2000) and is therefore considered unlikely to be absorbed across biological membranes such as the skin, gastrointestinal tract or respiratory system.

Although there is no toxicity data on the polymer itself, the proposed use pattern involves solely a solvent solution. Any toxicity data on the polymer solution would be confounded by the presence of solvent. It is expected that methods used for containment of the highly volatile and flammable solvent component of Uralac CP 1090 SN will also serve to minimise exposure to the polymer component.

Residual monomers are present at <0.1% and thus there is little potential hazard from this source.

At temperatures above 150°C in a humid atmosphere the polymer has a tendency to degrade to constituent monomers. However, this is only likely to occur during emergency situations and should not constitute a hazard under normal use conditions.

Low molecular weight polymers constitute a significant, albeit low, percentage of Uralac CP 1090 SN. It is expected that the low molecular weight polymers would be less hazardous than their constituent monomers. As they are present at a level which is less than that at which individual monomers are considered hazardous, the low molecular weight polymers should not constitute a hazard under normal use conditions.

Due to extremely low public exposure under normal use conditions, it is unlikely that Uralac CP 1090 SN will pose any serious health or safety hazard to the public.

10. ENVIRONMENTAL EXPOSURE

Release

The polymer solution is despatched to a paint manufacturer where it is formulated with additives and pigment and fed from the

mixing tank into steel containers to be delivered to the coil-coating site.

The control of emitted solvent vapours from the mixing process is through dust/vapour extraction hoods located at all primary mixing points.

The company states that in the unlikely event that a faulty formulation batch can not be reworked, disposal should take place by controlled incineration carried out by a Waste Management Authority of NSW approved contractor.

The surface coating is applied to coils of steel sheet by a continuous process. This process involves chemical treatment of the uncoiled metal, priming, finish coating, curing and recoiling of the metal. The finish coating process uses a reverse roller coater which leads to negligible loss of paint during application. This process obviates the need for painting lines and spray booths. The only paint loss appears to be the small amount left over at the bottom of the 200 L paint drum which is estimated to be less than 0.1%.

Solvent vapours and gases from the coil coating and curing processes are passed through scrubbers and after burners. The discharged emissions to the atmosphere are expected to be oxides of carbon and nitrogen.

The substance is expected to further polymerise during the curing/drying process and drying of the residue at the bottom of the 200 L paint drum to a higher molecular weight polymer.

Fate

By nature of the application, the polymer is required to be stable under a wide range of conditions. The polymer will form water vapour and oxides of carbon on combustion. As the substance is a fully saturated polyester in combination with other materials to form a coating resistant to weather and environmental conditions, biodegradation is expected to be an extremely slow process. The expected biodegradation products are oxides of carbon.

Results of degradation studies indicate that the substance does not undergo degradation under ambient conditions over a 5 year period (FT-IR and GPC methods).

11. ASSESSMENT OF ENVIRONMENTAL EFFECTS

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

The notified substance is not expected to exhibit toxic characteristics because large polymers of this nature are not readily absorbed by biota.

12. ASSESSMENT OF ENVIRONMENTAL HAZARD

The polymer is unlikely to present a hazard to the environment at any stage of its use, whether it be when incorporated into the paint, applied to the steel coils in the factory or in its end-use applications, since little is released.

The notified substance is not expected to exhibit toxic characteristics because large polymers of this nature are not readily absorbed by biota.

The notifier does not forsee the likelihood of landfill disposal of waste polymer as any off-grade paint would be returned to the manufacturer for reworking. This is expected to be unlikely as the paint manufacturer has adopted strict quality controls conforming to Australian Standard AS 3902 (1).

13. RECOMMENDATIONS FOR SAFETY PROCEDURES TO CONTROL OCCUPATIONAL EXPOSURE AND OCCUPATIONAL HAZARDS

Because Uralac CP 1090 SN is always dissolved in a solvent, precautions for spill and leakage, storage etc. appropriate to that solvent should be observed including:

. the workplace should be well ventilated and enclosed systems fitted with local exhaust ventilation should be used in polymer and paint mixing and handling operations;

. good work practices should be followed to avoid spillages or splashings;

. good housekeeping and maintenance are essential. Empty drums or cans should be removed to a safe place whilst awaiting disposal. Disposal should be in accordance with local regulations. Should there be an accidental spillage or leakage, make sure sources of ignition are absent and ventilate the area affected; for small quantities, absorb onto paper towels and evaporate the solvents in a fume hood, larger quantities should be collected and atomised in a suitable combustion chamber. Full personal protection should be worn in the event of a spillage or leakage.

. sources of ignition should be eliminated from work areas. Devices should be constructed of non-sparking material. All electrical equipment should meet the requirements of AS 3000 - *Electrical Installations - Buildings, Structures and Premises* (2), and conductive articles should be electrically grounded;

. a copy of MSDS for the polymer and paints should be easily accessible to employees.

The recommendations outlined in the MSDS for Uralac CP 1090 SN with regard to Precautions for Use and Safe Handling Information should be followed.

14. RECOMMENDATIONS FOR MATERIAL SAFETY DATA SHEET (MSDS)

The MSDS for Uralac CP 1090 SN has been compiled in accordance with Worksafe Australia format (3).

15. REQUIREMENTS FOR SECONDARY NOTIFICATION

Under the Industrial Chemicals (Notification and Assessment) Act 1989 (the Act), secondary notification of Uralac CP 1090 SN by Robert Decker & Co Pty Ltd shall be required if any of the circumstances stipulated under section 64(2) of the Act arise.

16. REFERENCES

1. Australian Standard 3902-1987 *Quality Systems - Model for Quality Assurance in Production and Installation*, Standards Association of Australia Publ., Sydney, 1987.

2. Australian Standard 3000-1986 *Electrical Installations - Buildings, Structures and Premises*, Standards Association of Australia Publ., Sydney, 1986.

3. National Occupational Health and Safety Commission *Guidance Note for the Completion of a Material Safety Data Sheet*, 2nd Edition, Australian Government Publishing Service Publ., Canberra, 1990.