

17 October 2000

**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION
AND ASSESSMENT SCHEME**

FULL PUBLIC REPORT

Ultrarez 58

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Director
Chemicals Notification and Assessment

FULL PUBLIC REPORT**Ultrarez 58****1. APPLICANT**

Eastman Chemical Ltd of level 8, 15 Talavera Road, NORTH RYDE, NSW 2113 (ACN ARBN 001 313417) has submitted a notification statement in support of their application for an assessment certificate for the synthetic polymer of low concern (PLC), Ultrarez 58.

2. IDENTITY OF THE CHEMICAL

The chemical name, molecular and structural formulae, molecular weight, spectral data and details of the polymer composition have been exempted from publication in the Full Public Report.

Trade name: Ultrarez 58

Number average molecular weight: >1000

3. POLYMER COMPOSITION AND PURITY

Details of the polymer composition have been exempted from publication in the Full Public Report. Residual monomer content was below detectable level.

4. PLC JUSTIFICATION

The notified polymer meets the PLC criteria.

5. PHYSICAL AND CHEMICAL PROPERTIES

Property	Result	Comments
Appearance	Light coloured solid in flake form.	
Melting point	Not provided.	
Specific gravity	1.1	Ink vehicle product (SMB 900), containing Ultrarez 58.

Water solubility	Not determined	Expected to be insoluble in water (see below)
Particle size	1-3 cm on any one side	
Flammability	Non-flammable under normal condition of use.	
Flash point	>65 °C	For SMB 900
Autoignition temperature	Not expected to autoignite.	
Explosive properties	Not explosive.	During a fire, oxides of carbon, hydrocarbons, fumes and smoke may be produced.
Stability/reactivity	Not expected to degrade or undergo hazardous polymerisation under normal conditions.	It may react with strong oxidising agents

5.1 Comments on physical and chemical properties

The specific gravity was reported for the imported ink product not the notified polymer as an individual component.

The water solubility was not determined for this polymer. The notified polymer is expected to be insoluble in water due to a high molecular weight, and the main constituent of the polymer is a rosin compound (57%) which is reported to be insoluble in water (Merk Index, 11th Edition).

The notified polymer is stable at ambient conditions, it may however, react with strong oxidising agents.

The polymer is not expected to hydrolyse under environment conditions. The notified polymer does contain ester groups but due to its low water solubility hydrolysis is not anticipated.

6. USE, VOLUME AND FORMULATION

Use:

The notified polymer will be imported into Australia in 200 L drums or 25 000 L isotanks as a resin ingredient at 35-50% within an ink vehicle product, SMB 900. It will be reformulated into a finished ink product at 10-30% for use in the paper printing industry. The resin is used to improve the durability, chemical resistance, appearance, adhesion and speed of drying of the ink vehicle.

Manufacture/Import volume:

The initial import quantity will be a maximum of 5000 tonnes/year of the notified polymer for the first five years.

Formulation details:

The ink vehicle product will be formulated into a finished ink product by mixing it with other raw materials, such as pigments and naphthenic process oils. Reformulation of the product into finished ink will occur in NSW, Australia. The finished ink will be held within 15 kg pails, 200 L drums or 1 200 kg tote tanks and transported for use to customers in the paper printing industry.

7. OCCUPATIONAL EXPOSURE

Task	Exposure route	Exposure details	Controls indicated by notifier
<i>Formulation (5 workers, 8 h/day, 350-365 days/year)</i>			
Transfer of ink vehicle (35-50% notified polymer) to storage tanks and mixing vessels.	Dermal	Ink vehicle will be transferred from drums or iso-tanks to holding tanks from which it will be pumped to mixing vessels.	Automated transfer and formulation processes, enclosed bead mill and local extraction system; gloves, coveralls, safety glasses and safety boots.
Mixing of ink product.	Dermal	Other materials, such as pigments, will be added and mixed.	
Transfer of final ink product (10-30% notified polymer) to containers.	Dermal	The final product will be transferred via a manifold system to product containers.	
Cleaning of equipment.	Dermal	Workers may be exposed to drips and spill of ink while connecting and disconnecting filling pipes.	

QC testing (2 workers; intermittently)

Dermal	Product is expected to be handled in small quantities under laboratory conditions.	Not provided; Overalls, gloves and safety glasses.
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End use (Workers at newspaper printing; 8-10 h/day, 365 days/year)

<i>Transfer of product (10-30% notified polymer) from containers to holding tanks or directly onto the printing material.</i>	Dermal	Workers may be exposed to drips and spill of ink product while connecting and disconnecting transfer lines.	Automatic dispensing of the product; gloves, coveralls and safety boots.
<i>Cleaning of printing equipment.</i>	Dermal	Exposure may occur while washing printing equipment with solvents.	Engineering controls not described; gloves, coveralls and safety boots.
Use of printed paper	None	Exposure to notified polymer not expected. The ink is expected to bind strongly to the printed paper. No detailed information was provided.	None.

Transport and storage (6-10 workers, 8 h/day, 12-20 days/year)

<i>Unloading and transport of drums or iso-tank.</i>	None	Handling sealed drums or iso-tanks; no exposure expected except in case of accident.	None.
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8. PUBLIC EXPOSURE

The public could be exposed to the notified polymer in the event of a spill or leak from the containers. The finished ink product will not be sold to the public. The public will be exposed to the notified chemical by dermal contact with the dried ink on paper. Once the ink is dried, it is reportedly strongly bound to the paper and is unlikely to be removed easily; therefore the potential for public exposure to the notified polymer is expected to be low.

9. ENVIRONMENTAL EXPOSURE

9.1. Release

The ink product vehicle containing up to 50% notified polymer is reformulated, in Australia, into finished ink product that contains up to 30% notified polymer. It is expected that 1% of the finished ink product (100 tonnes) will be lost due to accidents and spills in the reformulation process. This loss equates to 0.6% of the imported ink product vehicle or 30 tonnes of the notified polymer (assuming a maximum of 5000 tonnes of notified polymer imported per year). Any spilled final ink product is collected into drums and disposed of by a licensed waste contractor. The transfer lines associated with the processing equipment are usually not cleaned out as cleaning is only required between different batches. Naphthenic oil, an ingredient in the final ink product, is used to clean the transfer lines. The oil used in the cleaning process is then reused in the next batch of ink reformulation so no oil is disposed off site or to the sewer.

It is estimated that approximately 1% of the imported ink product will remain in the import containers on emptying. The 1% residue equates to 50 tonnes notified polymer per year. The empty drums containing residues of the notified polymer will generally be sent to landfill by a licensed waste contractor.

Estimated losses of the final ink product containing 30% notified polymer at application site is 1% due to spills or leaks. This represents 0.6% of the imported ink vehicle product equating to 30 tonnes/year of the notified polymer. A further 1% of the finished ink product is estimated to remain in empty supply drums. This represents a further 30 tonnes/year notified polymer. Residues from spills and empty containers at the applicator sites would be disposed of to landfill by a licensed waste contractor. Any finished ink product spilt at applicator sites is contained then placed into drums for disposal.

The finished ink product is transferred on to various grades of paper. It is assumed that this is an efficient process and little waste is expected. Once dry it is not expected to be easily removed or enter the environment. The product is designed to be highly durable, chemically resistant, have strong adhesive properties and resist rubbing.

The total amount of notified polymer released to the environment via landfill from empty transport drums, accidents and spills both in reformulation and applicator use is estimated to be 140 tonnes per year.

9.2. Fate

The notifier indicates that substrates such as newspaper and other printed paper, containing the notified polymer in a dry state and no longer required, are expected to be sent for recycling or to landfill.

During recycling, waste paper is pulped and de-inked using dispersing and wetting agents, organic solvents and bleaches. After pulping, the contaminants and ink are separated from the fibres by pumping the stock through heat washing, screening, cleaning, flotation and dispersion stages. Polymer removed from the paper is likely to be incorporated with the sludge remaining from recycling due to its water insolubility. Sludge is likely to be discarded to landfill or incinerated. Combustion products are likely to be water and oxides of carbon and hydrogen.

The notifier has indicated that transport containers are unlikely to be reused or recycled. Once empty, they are likely to be disposed of to landfill.

Once in landfill, leaching of the ink mix is unlikely to occur due to the expected water insolubility. Hydrolysis of the polymer is also unlikely. Any polymer accidentally entering waterways would be expected to settle out onto sediments. The polymer is not expected to cross biological membranes, due to the low solubility and high molecular weight. Therefore the notified substance is not expected to bioaccumulate.

10. EVALUATION OF HEALTH EFFECTS DATA

No toxicological data were provided.

11. EVALUATION OF ENVIRONMENTAL EFFECTS DATA

No ecotoxicological data were provided.

12. ENVIRONMENTAL RISK ASSESSMENT

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

Reformulation in Australia will result in release of approximately 30 tonne/year of the notified polymer as waste to be disposed of to landfill. No loss of the notified polymer is expected from the cleaning process in reformulation as the oil used in cleaning is recycled into the next batch.

Accidental spillage, an estimated 30 tonnes of polymer per year, at the application site would be sent as waste to landfill. Leaching of the polymer from landfill sites is not expected.

Environmental exposure to the notified substance when paper containing the polymer is recycled or disposed of is possible but highly unlikely due to the stability of the finished ink product. The polymer would remain either bound to waste paper, or to sludge that results from the recycling processes and is likely to be sent to landfill or incinerated. Therefore, the

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

13. HEALTH AND SAFETY RISK ASSESSMENT

13.1. Hazard assessment

No toxicological data was submitted on the notified polymer. The notified polymer is unlikely to cross biological membranes due to its negligible water solubility and high number average molecular weight. On the basis of the submitted data, the notified polymer would not be classified as hazardous in accordance with the NOHSC *Approved Criteria for Classifying Hazardous Substances* (National Occupational Health and Safety Commission, 1999).

The MSDS for the ink vehicle product, SMB900, lists a number of potential health effects, namely nausea, vomiting, headache, dizziness and incoordination following ingestion and excessive inhalation, and eye and skin irritation on dermal and eye contact. These are related to the hydrocarbon solvents and additives in the mixture rather than the notified polymer itself.

13.2. Occupational health and safety

Waterside, warehouse and transport workers will only be exposed to the notified polymer in the ink product vehicle or the final ink product in the event of an accident or damage to packaging. The occupational health risk to these workers is negligible, given the low toxicity hazard it presents.

The transfer and reformulation processes in Australia are automated to minimise worker exposure. Plant operators could be exposed, via dermal route, to the notified polymer at up to 50% when connecting transfer lines and hoses or if there are spills or leaks from the containers. Skin contact may also occur during the filling of product containers, particularly if spillage occurs. Local exhaust ventilation is provided during mixing, and production workers will wear overalls, protective gloves, safety glasses and safety footwear to reduce the potential for exposure to hydrocarbon solvents. These industrial controls and personal protective equipment are considered to be sufficient to minimise the health risk from the notified polymer to formulators.

At the printing site, the notified polymer at up to 30% will be automatically dispensed into larger holding tanks from product containers or directly dispensed onto the printing medium. Printing workers may experience skin contact with the notified polymer during direct application and when connecting hoses. However, workers will be required to wear coveralls, safety glasses, impermeable gloves and safety boots, and the machines will be placed in well-ventilated areas to reduce respiratory exposure to the solvents used in the process. Considering all of the above, some dermal and respiratory exposure to the notified polymer during reformulation and printing may occur but the health risk is considered low.

Taking into account the expected low toxicity of the notified polymer, its low potential for absorption and the control measures in place to reduce exposure to organic solvents, the risk of adverse health effects due to the notified polymer is low.

The risk to users of printed paper is negligible as the notified polymer is reportedly bound within the matrix.

Conclusion

Polymer Ultrarez 58 is of low concern to occupational health and safety and no specific risk reduction measures are necessary.

13.3. Public health

The finished ink product will not be sold to the public. The public will be exposed to the notified polymer by dermal contact with the dried ink on paper. Once the ink has dried, it is strongly bound to the paper and is unlikely to be removed easily. Therefore, the potential for public exposure to the notified polymer is expected to be low.

14. MSDS AND LABEL ASSESSMENT

14.1. MSDS

The MSDS of the imported product containing the polymer provided by the notifier was in accordance with the NOHSC *National Code of Practice for the Preparation of Material Safety Data Sheets* (NOHSC, 1994a). It is published here as part of the assessment report. The accuracy of the information on the MSDS remains the responsibility of the applicant.

14.2. Label

The label for the imported product containing the notified polymer provided by the notifier was in accordance with the NOHSC *National Code of Practice for the Labelling of Workplace Substances* (NOHSC, 1994b). The accuracy of the information on the label remains the responsibility of the applicant.

15. RECOMMENDATIONS

No specific precautions are required for the notified polymer. However, as the notified polymer is imported as a product containing liquid hydrocarbon solvents, the following guidelines and precautions should be observed to minimise occupational exposure:

- Protective eyewear, chemical resistant industrial clothing and footwear and impermeable gloves; where engineering controls and work practices do not reduce vapour and particulate exposure to safe levels, an air fed respirator should also be used;
- Spillage of solutions containing the notified polymer should be avoided. Spillages should be cleaned up promptly with absorbents which should then be put into containers for disposal;

- A copy of the product MSDS should be easily accessible to employees.

If products containing the notified chemical are hazardous to health in accordance with the NOHSC *Approved Criteria for Classifying Hazardous Substances* (National Occupational Health and Safety Commission, 1999), workplace practices and control procedures consistent with State and territory hazardous substances regulations must be in operation.

Guidance in selection of protective eyewear may be obtained from Australian Standard (AS) 1336 (Standards Australia, 1994) and Australian/New Zealand Standard (AS/NZS) 1337 (Standards Australia/Standards New Zealand, 1992); for industrial clothing, guidance may be found in AS 3765.2 (Standards Australia, 1990); for impermeable gloves or mittens, in AS 2161.2 (Standards Australia/Standards New Zealand, 1998); for occupational footwear, in AS/NZS 2210 (Standards Australia/Standards New Zealand, 1994a).

16. REQUIREMENTS FOR SECONDARY NOTIFICATION

Secondary notification may be required if:

- (i) any of the circumstances stipulated under subsection 64(2) of the Act arise. If any importer or manufacturer of (the notified polymer) becomes aware of any of these circumstances, they must notify the Director within 28 days; or
- (ii) the notified polymer is introduced in a chemical form that does not meet the PLC criteria.

17. REFERENCES

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