File No: NA/86

Date:19 November 1992

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME

FULL PUBLIC REPORT

HALOFLEX 281, HALOFLEX EP 281

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Director
Chemicals Notification and Assessment

FULL PUBLIC REPORT

HALOFLEX 281, HALOFLEX EP 281

1. APPLICANT

ICI Australia Operations Pty. Ltd, 1 Nicholson Street, Melbourne 3000.

2. IDENTITY OF THE CHEMICAL

Trade Name: Haloflex 281, Haloflex EP 281

Based on the nature of the chemical and the data provided, Haloflex 281, Haloflex EP 281 is not considered to be hazardous. Therefore the details relating to the chemical name, CAS number, molecular and structural formulae, molecular weight, spectral data and monomers have been exempted from publication in the Full Public Report and the Summary Report.

Number Average Molecular Weight: > 1000

Maximum percentage of low molecular weight species (molecular weight < 1000): <5%

3. PHYSICAL AND CHEMICAL PROPERTIES

The polymer is not isolated and is available only as a 50% aqueous emulsion. The following properties relate to that emulsion.

Appearance at 20°C and 101.3 kPa: milky white emulsion

Boiling Point: 100°C (b.p. of water)

Specific Gravity: 1.11 at 20° C (emulsion)
1.22 calculated (polymer)

Vapour Pressure:	that of water, polymer is not expected to be volatile by analogy with similar polymers.
Water Solubility:	expected to be insoluble by analogy with similar polymers
Partition Co-efficient: (n-octanol/water)	not provided
Adsorption/ Desorption:	not provided
Dissociation Constant:	not provided
Flash Point:	not applicable to an aqueous emulsion
Flammability Limits:	not applicable to an aqueous emulsion
Autoignition Temperature:	not applicable to aqueous emulsion
Pyrolysis products:	Under fire conditions the dried paint film will burn emitting carbon and nitrogen hydrogen chloride.
Explosive Properties:	polymer and emulsion are non-explosive
Reactivity/Stability:	store away from strong oxidising agents. On evaporation of water, the polymer will coalesce to form an insoluble clear solid (glass-like) flakes
Particle size distribution:	not applicable

The following comments on the physico-chemical properties of the notified polymer have been provided by the notifier.

The specific gravity for the polymer was calculated as 1.22. The method of calculation was not specified by the notifier.

By analogy with similar polymers, the notified polymer is not volatile. For the polymer emulsion the vapour pressure would be that for water.

By analogy with similar polymers, the notified polymer is insoluble in water but this has not been measured. If the polymer were water soluble, it would not be possible to form a stable polymer in water emulsion. However, it is dispersible in water.

By analogy with similar polymers, the polymer is not subject to hydrolysis but this property has not been measured. CEPA notes that theoretically the polymer may be hydrolysable but this is not likely to occur under environmental conditions.

Partition coefficient is not applicable because the polymer is not anticipated to cross biological membranes because of its high molecular weight. CEPA notes that such data would not be readily obtainable because the polymer would be unlikely to dissolve in octanol.

No specific information is available for adsorption-desorption. However, on evaporation of water the polymer will coalesce (polymerise) to form an insoluble clear solid (glass like flakes). CEPA expects the polymer would be immobile in soil after drying.

Dissociation has not been measured as it is considered inapplicable due to the nature of the polymer and its water insolubility. CEPA notes the polymer does not contain any readily dissociable groups.

4. PURITY OF THE CHEMICAL

Degree of purity: The polymer is prepared as a 50% emulsion in water.

Maximum content of residual monomers:

The residual monomers do not meet the criteria for classification as a hazardous substance either because of their inherent properties or because of the low concentration in which they are present. The identity and concentrations of these monomers have been exempted from publication in the Full Public Report and the Summary Report.

Additives/Adjuvants

The additives / adjuvants do not meet the criteria for classification as a hazardous substance. The identity of these chemicals has been exempted from publication in the full Public report and the Summary Report.

5. INDUSTRIAL USES

Haloflex 281 will be imported as the 50% water based emulsion in quantities of 10-100 tonne/annum (5-50 tonne of polymer).

It will be incorporated into a waterborne metal primer for application to non-ferrous surfaces by professional painters and home handymen.

6. OCCUPATIONAL EXPOSURE

The polymer will be stored and transported in 200 L plastic lined steel drums and the primer transported in 500 ml, 1 L and 4 L tinplate cans. Exposure is expected to be minimal unless a spill occurs.

Manufacture of primer containing the notified polymer is conducted in mixers fitted with exhaust ventilation to ensure volatile substances are not vented to the workplace. The primer is filled into drums under exhaust ventilation.

Any quality control testing involving spray painting is conducted in an appropriate spray painting booth to minimise exposure to mists and aerosols of the primer containing the notified chemical.

The primer will be applied using brush, roller or spray, and will mainly be used outdoors. Conditions of application are recommended in the material safety data sheet.

7. PUBLIC EXPOSURE

The polymer emulsion will be stored and transported in 200 L steel drums. On reformulation, the polymer emulsion is mixed with other (unidentified) ingredients to produce a water-based primer paint. Spillage will be restricted to the plant and wash-water will be recycled back into the process. Public exposure to the polymer emulsion will therefore be minimal.

The reformulated paint product will be available in 500 mL, 1 L and 4 L tin-plate cans. Public exposure to the paint will be as a liquid (by home handymen) and the dried paint film. Application equipment (spray guns, brushes, rollers) will be washed into drains and residues in spent cans will be disposed of in home garbage and landfill. No information was available regarding the extent to which the polymer will be diluted in the paint.

8. ENVIRONMENTAL EXPOSURE

The polymer emulsion and other ingredients undergo dispersion and blending at high speeds in a mixer. The batch is adjusted, tested, filtered and filled into containers for distribution. Wash water used to clean mixers and other equipment is recycled back into the process.

8.1 Release

The notifier has estimated that ~100 kg per annum of waste polymer will be generated during paint manufacture as the result of spills etc. Spills at the plant are contained through bunding, and will be disposed of according to regulations set down by the NSW Waste Management Authority. Current practice is to send the waste to Castlereagh trade waste dump for treatment. The notifier understands the process adopted is to flocculate out the paint solids and set them in concrete for landfill.

Widely dispersed releases to the environment are likely to occur as the result of cleaning paint application equipment, ie brushes, rollers etc and the disposal of paint cans which may contain small residual quantities of the paint. The notifier states that washings from cleaning equipment are likely to be washed down the drain with copious quantities of water, as already occurs with similar waterbased paints used by the general public. Empty paint cans are generally disposed of via normal household garbage for consignment to council land fills. It is estimated that ~200 kg of polymer waste will be disposed of each year as a result of such use.

8.2 Fate

The notifier states the polymer is essentially stable and will not readily break down. The polymer in the paint further polymerises on drying to form a very high molecular weight stable paint film, that is firmly adherent to the metal surfaces to which it is applied. Very slow deterioration of this film may occur as the result of polymer chain scission through UV absorption from sunlight. This is unlikely to occur as the primed metal surfaces will be further coated with other decorative paints. Under extreme heat conditions, eg fire, the paint film containing the polymer will burn emitting oxides of carbon and nitrogen, and hydrogen chloride.

Water used for cleaning equipment (eg rollers, paintbrushes) is likely to be washed down sinks to mix with other waste streams entering waste water treatment plants. The polymer is likely to remain in suspension because of its miscibility with water. The degree of removal which the polymer will undergo during sewage treatment is unclear, given that it is discharged to sewer as a water miscible emulsion. However, the polymer emulsion will eventually lose its stability and the polymer will deposit on surfaces, to become incorporated in sediment or sludge. Slow degradation (eg dehydrochlorination with subsequent chain scission) may then occur, but significant release of degradates to the water column appears unlikely.

9. EVALUATION OF TOXICOLOGICAL DATA

Under the *Industrial Chemicals (Notification and Assessment) Act, 1989* (the Act), no toxicology testing is required for polymers of average number molecular weight > 1000. No test results were submitted.

10. ASSESSMENT OF ENVIRONMENTAL EFFECTS

Ecotoxicological testing is not required for polymers of molecular weight >1000 under the Act. Such large molecules generally do not exhibit toxic characteristics as they are not transported readily across biological membranes.

11. ASSESSMENT OF ENVIRONMENTAL HAZARDS

Waste polymer generated during paint manufacture (~100 kg per annum) is unlikely to present a hazard to the environment as the polymer is sent to Castlereagh trade waste dump where solids are set in concrete for disposal to land fill. It is unlikely that the paint solids will exit from the concrete.

The disposal of the polymer to sewer as a result of the washing of painting equipment (~200 kg per annum) is unlikely to present a hazard to the environment as the release will be dispersed across Australia (predominantly in the urban regions) and the environmental concentration of the polymer in the receiving waters should be very low. The expected very low concentration of the polymer in aquatic environments and the polymer's high molecular weight indicate the hazard to aquatic organisms should be minimal.

12. ASSESSMENT OF PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY

Haloflex is a polymer of large molecular mass and is unlikely to cross biological membranes. As such, it is expected to have low potential for toxicity. Three free monomers have been identified as impurities in the polymer, one of which is present in significant proportions However this monomer is not classified

as a hazardous substance, occupational exposure is low and, therefore, the occupational hazard from this monomer is considered to be low. Since public exposure to the polymer emulsion is expected to be low, the monomer is not considered to be of significant hazard under the proposed conditions of use. The other two residual monomers are present in extremely low quantities and are not expected to present a toxicity hazard.

Vapour pressure of the compound is likely to be low. There is no information on irritant potential of the notified polymer. Inhalation hazards may arise from spray painting with the primer containing the product but not from vapours of the product itself.

13. RECOMMENDATIONS FOR THE CONTROL OF PUBLIC AND WORKER EXPOSURE

The following guidelines and precautions should be observed when using Haloflex 281:

. workers using Haloflex 281 should wear protective clothing conforming to AS 3765.1 (2) or 3765.2 (3), impervious gloves conforming to AS 2161-1978 (4) and safety glasses conforming to AS 1337-1984 (5).

. spray painting with paints containing Haloflex 281 should be carried out in a proper spray painting booth, where possible.

. if use of a spraypainting booth is not possible, safety glasses conforming to AS 1337-1984 and respirators conforming to AS 1715-1991 (6) should be worn.

. good housekeeping should be observed to avoid splashes and spills.

spills of paint or emulsion should be contained and absorbed with sand or soil.

workers cleaning up spills should wear protective clothing (as above) to avoid skin and eye contact.

workers using Haloflex 281 and products containing it should have access to material safety data sheets (MSDS).

14. MATERIAL SAFETY DATA SHEET

The Material Safety Data Sheet (MSDS) for Haloflex281, Haloflex EP 281 (Attachment 1) was provided in Worksafe Australia format (7). This MSDS was provided by ICI Australia Operations 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 ICI Australia Operations Pty Ltd.

15. REFERENCES

(1) Sax, Irving. Dangerous Properties of Industrial Materials. Van Nostrand Reinhold New York 1991.

(2) Australian Standard 3765.1-1990 *Clothing for Protection against Hazardous Chemicals Part 1 Protection against General or Specific Chemicals* Standards Association of Australia Publ, Sydney 1990.

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

(4) Australian Standard 2161-1978 *Industrial Safety Gloves and Mittens (excluding Electrical and Medical Gloves)*, Standards Association of Australia Publ, Sydney 1978.

(5) Australian Standard 1337-1984 *Eye Protectors for Industrial Applications*, Standards Association of Australia Publ, Sydney 1984.

(6) Australian Standard 1715- 1991 *Selection, use and maintenance of Respiratory Protective Devices*, Standards Association of Australia Publ, Sydney 1991.

(7) Guidance Note for Completion of a Material Safety Data Sheet. [NOHSC : 3001 (1991)], 3rd Edition, October 1991.