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May 2000

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME

FULL PUBLIC REPORT

KG16470

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Director
Chemicals Notification and Assessment

FULL PUBLIC REPORT

KG16470

1. APPLICANT

DuPont (Australia) Ltd of 49-59 Newton Road WETHERILL PARK NSW 2164 has submitted a standard notification statement in support of their application for an assessment certificate for KG16470.

2. IDENTITY OF THE CHEMICAL

The chemical name, other name, CAS number, molecular and structural formulae, molecular weight, spectral data, purity, impurities, additives/adjuvants, details of the chemical composition and details of exact import volume have been exempted from publication in the Full Public Report and the Summary Report.

Marketing Name: KG16470

3. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa: A clear to light yellow liquid

Boiling Point: >300°C

Specific Density: 0.985 g/cm^3 at 25°C

Vapour Pressure: 1.33×10^{-32} kPa at 25°C

Water Solubility: 1.45×10^{-18} mg/L

Partition Co-efficient (n-octanol/water): log P_{OW}= 20.52

Hydrolysis as a Function of pH: $T_{1/2}$ at pH 7.0 = 5.3 years
$T_{1/2}$ at pH 8.0 = 193 days

Adsorption/Desorption: log K_{OC} = 12.835

Dissociation Constant: Does not dissociate

Flash Point:	Not determined
Flammability Limits:	Not determined
Autoignition Temperature:	>449°C (estimated)
Explosive Properties:	No intrinsic explosive properties.
Reactivity/Stability:	Stable

Comments on Physico-Chemical Properties

The notifier did not determine the boiling point, vapour pressure, water solubility and partition coefficient of the notified chemical. The values stated were estimated from a physical property software package from the Syracuse Research Corp. The values were based on a major component of the notified chemical. These results were confirmed by undertaking an ASTER Ecotoxicity Profile on another major component of the product (US EPA, 1996). The results are summarised below:

Boiling Point:	> 651ºC
Specific Gravity:	0.985 g/cm^3 at 25ºC
Vapour Pressure:	6.28 x 10^{-21} kPa (4.71 x 10^{-20} mm Hg)
Water Solubility:	9.94 x 10^{-8} mg/L
Hydrolysis:	Half life > 1 000 days
Partition Coefficient:	Log P_{OW} = 11.1
Adsorption/Desorption:	Log K_{oc} = 7.37

The value for the partition coefficient Log P_{OW} was also estimated to be 13.41 from the physical property software package from the Syracuse Research Corp. that may be accessed on the internet (http://esc.syrres.com/).

The notifier indicates that the notified chemical is expected to be of low solubility due to its high molecular weight and hydrophobic character. The water solubility of the notified chemical is expected to be low, that is < 1 mg/L, as demonstrated by the calculated solubility of the two components.

The chemical contains ester linkages that could be expected to undergo hydrolysis under extreme pH conditions. However, due to the low water solubility, this is unlikely in the environmental pH range of between 4 and 9, again the calculated values confirm this.

It was noted that the determination of partition coefficient and adsorption/desorption could not be undertaken as the notified chemical is expected to be insoluble in water and will largely partition into n-octanol rather than water. Due to its low water solubility, the chemical is expected to become associated with the organic component of soils and sediments. This is indicated by the calculated value of Log P_{OW} = 20.52 for the partition coefficient of the major component by the notifier and confirmed by the value determined through ASTER Ecotoxicity Profile. The calculated Log P_{OW} values are very high, which is indicative of either strong binding or association with soil and sediment.

The notifier did not determine the dissociation constant of the notified chemical. The notifier states that the notified chemical does not dissociate. It is noted that at very high pH the hydroxyl functionality in the notified chemical may be deprotonated, however, the notifier indicates that it is highly stable under normal conditions and considered unreactive.

4. PURITY OF THE CHEMICAL

Degree of Purity: High

5. USE, VOLUME AND FORMULATION

The notified chemical, KG16470 is a component of a paint formulation used mainly for heavy vehicles and earth moving equipment.

KG16470 will not be manufactured or reformulated in Australia but will be imported as an ingredient (30-60%) in a solvent-based paint formulation, Imron 6000 8960S Binder in 3.78 litre Dangerous Goods approved containers. No reformulation or repackaging of the imported notified chemical will occur prior to distribution to spray painting companies. Less than 50 tonnes of the notified chemical will be imported per annum for the first five years.

The notified chemical is manufactured as a resin solution and not separately available.

6. OCCUPATIONAL EXPOSURE

Transport and Storage
The notified chemical will be imported in 3.78 L Dangerous Goods approved cans. The notifier has provided no detail on the type of packaging for the overall shipment of imported individual containers or the handling involved in breaking up the shipment into individual containers for dispatch to the customer sites. The notifier states that the individual product containers are not opened before arrival at the end use site and that the likelihood of a spill is low.

The product is stored in a Dangerous Goods approved warehouse and transported in small lots to the customer facility. Waterfront, transport and warehouse workers are not expected to be exposed to the notified chemical except in the case of an accident involving spillage of the paint.

End Use
The notifier estimated that up to 1 425 spray painters across Australia could be exposed to the notified chemical. The spray painters who will be exposed to the notified chemical will be fully TAFE trained. The spray painter will measure the appropriate amounts of the different components required in a particular formulation and mix them together in a mechanical paint shaker. The concentration of the notified chemical in the final preparation is estimated to be

36%. The painter then pours this mixture into a spray gun. The notifier states that weighing and mixing are carried out in a well ventilated area.

The spraying of vehicles or equipment will be carried out in a laminar flow downdraft spray booth, which is designed to rapidly remove aerosol particles and solvent vapour from the atmosphere. Several possible booth designs may be used. In a dry floor booth, the overspray will be collected in filters contained in the floor of the booth; any unremoved particulates will reach the exhaust stack with the solvent vapours. In a wet floor booth, overspray will collect in a pool of water below the grill floor or in a wet scrubber in the exhaust and will be removed with a filter. The residual solids will be disposed of to secure landfill. The spray booths are subject to AS/NZS/4114.1:1995 *Spray Painting Booths–Design, Construction and Testing* (Standards Australia/Standards New Zealand, 1995a) and AS/NZS/4114.1:1995 *Spray Painting Booths–Selection, Installation and Maintenance* (Standards Australia/Standards New Zealand, 1995b).

Residual paint mixture will be washed from the equipment manually, using recycled paint solvent, and the washings will be disposed of by solvent recyclers. The notifier states that the weighing station has exhaust ventilation.

The notified chemical is of 50% in the dried paint film. Once residual final paint mixture has dried, the notified chemical will be irreversibly bound within the cured matrix and not separately available for either exposure to workers, or for dermal absorption.

Spray painters will wear appropriate personal protective equipment at all times; goggles or safety spectacles, gloves and overalls while weighing and mixing the paint, and cleaning spray equipment. In addition, a full face shield and respirator are worn by workers operating inside the spray booth.

7. PUBLIC EXPOSURE

Paints containing the notified chemical will be sold only to licensed professional spray painters and will not be available to the general public. The potential for public exposure to the notified chemical during transport and coating operations or from disposal is assessed as negligible. Although members of the public will make dermal contact with vehicles and equipment coated with products containing the notified chemical, exposure will be negligible because of the cured state of the notified chemical in the coatings.

8. ENVIRONMENTAL EXPOSURE

Release

There is potential for release of the notified chemical during the paint formulation and the paint application. The paint is applied to automotive surfaces with approximately 50-80% efficiency in spray booths with control measures, such as a filtering system and masking materials, in place. Cleaning of the spray gun and mixing equipment will generate waste that will be collected and disposed of in the same manner as wastewater from the spray booth.

During coating application, it is expected that up to 3 tonnes of notified chemical waste by year 5 will be produced.

Some residue will also remain in the 'empty' containers after use. It is estimated that 150 kg of the notified chemical by year 5 (5% of the container contents of which 50% is the notified chemical) will remain as residue in the containers.

A further 150 kg of the notified chemical by year 5 will remain as residues in spray equipment.

Fate

Once applied to the metal panels of heavy trucks and equipment the notified chemical will be incorporated in a hard, durable, inert film and would not present a significant hazard. Any fragments, chips and flakes of the lacquer will be of little concern as they are expected to be inert. The metal panels coated with the chemical are likely to be either recycled for steel reclamation or be placed into landfill at the end of their useful life. When recycled the chemical would be destroyed in the blast furnaces and converted to water vapour and oxides of carbon.

The solid waste generated in the formulation and application of the coating will be disposed to landfill, although incineration is an option. The product when sprayed will be catalysed with an isocyanate activator. Therefore, all overspray will become crosslinked and become totally insoluble due to high molecular weight. The containers and their residue will also be disposed in this manner, which are expected to dry out to a hard residue. Leaching of the notified chemical from landfill from these sites is unlikely, given the low solubility of the substance and very high molecular weight. Under these conditions, the notified chemical waste would be slowly degraded to gases such as carbon dioxide through the agency of abiotic and bacteriological processes.

Mixing containers and spray equipment will be washed with solvent that is collected and sent to solvent recycling. The resulting dried solid residues will be also disposed to landfill.

The notifier also calculated the adsorption/desorption of the notified chemical triester with a Mackay Level 1 model which estimates partitioning of 51.7% and 48.2% to the soil and sediment compartments, respectively, and essentially none to the air and water compartments (Mackay, 1991). The ASTER Ecotoxicity Profile carried out on the corresponding diester confirmed these results.

The notified chemical is not expected to cross biological membranes, due to the low solubility, high molecular weight and strong adsorption to soil, and as such should not bioaccumulate (Connell, 1989).

9. EVALUATION OF TOXICOLOGICAL DATA

No toxicological test data was available for the notified chemical. The notifier provided a combination of literature searches and toxicological modeling reports for two related chemicals, Castor oil and trimethylolpropane. These comprised the following:

- Toxicological studies in the literature,
- BIBRA toxicity profile of Castor oil (Bibra, 1990),
- NTP technical report on Castor oil (Irwin, 1992),
- DuPont Haskell Laboratory review of trimethylolpropane (DuPont, 1996),
- Copy of New Substance Notification to Environment Canada under the Canadian New Substances Regulation,
- DuPont Central Research and Development correspondence, and
- Chemical databases searches for Castor oil and trimethylolpropane e.g. HSDB, RTECS.

9.1 Castor Oil

9.1.1 Summary of Toxicity Studies

Castor oil is a viscous liquid miscible with ethanol, diethyl ether and chloroform. The main ingredient in Castor oil is ricinoleic acid (87-90%). The other constituents include oleic acid, linoleic acid, palmitic acid, stearic acid and dihydroxystearic acid.

An administration by stomach tube of approximately 12 g/kg in rats caused certain biochemical changes in colon. Oral doses approximately 0.17 g/kg or more are laxative in humans. High doses may cause vomiting, nausea and colic. Castor oil was of very low acute oral toxicity in humans with an estimated lethal oral dose approximately 7 500 mg/kg. The lowest dose of ricinoleic acid at which mortality occurred following an accidental ingestion was 5 000 mg/kg.

Castor oil was a slight skin and eye irritant in mice and rabbits. However, irritation effects are not observed in humans. A few cases (5-6) of sensitisation (contact dermatitis), which were reported in the literature, were probably due to the ingredient of Castor oil in cosmetics and other products (BIBRA, 1990).

Daily repeated subcutaneous injection of Castor oil (5 g/kg for 4 weeks) produced weight change in adrenal glands in mice. In two repeat dose dietary studies (5-24.2 g/kg/day for 25-40 days), no reduction of bodyweight gain, gross abnormalities or fatty tissue changes in adult rats. However, some reduction in weight gain was observed in young rats at 20 g/kg/day for up to 8 weeks.

Castor oil was neither a carcinogen in female mice after repeated intravaginal injections of ricinoleic acid (0.1 g/kg) over 50 weeks, nor a tumour promoter in mice via dermal applications over 40 weeks. However, subcutaneous neoplasm was noticed in rabbits after intermittent subcutaneous injections of 3 120 mg/kg ricinoleic acid for 52 weeks.

Castor oil was not mutagenic or clastogenic in several *in vitro* or *in vivo* genetic toxicological assays (detailed in 9.1.3 below).

9.1.2 13-Week Repeated Dose Toxicity (Irwin, 1992)

Part 1: Rat Study

Species/strain:	Rats/F344/N
Number/sex of animals:	10/sex/group (terminated at Day 21), 10/sex/group (terminated at Day 90).
Method of administration:	dietary
Dose/Study duration::	0, 0.62, 1.25, 2.5, 5, and 10% Castor oil in feed mixture for 13 weeks. Actual doses (mg/kg bodyweight/day) were 0, 404, 809, 1 583, 3 067 and 5 835 in males and 0, 401, 797, 1 569, 3 045 and 5 725 in females.
Test method:	Similar to OECD TG 407

Clinical observations:
All rats survived. No treatment-related effects were observed in food consumption and bodyweight gain in both male and female rats at all dose levels.

Clinical chemistry/Haematology
Blood samples were taken at days 5, 21 and 90 for haematology and clinical chemistry assays.

Clinical chemistry studies showed that an increase in the activity of serum alkaline phosphatase was treatment- and dose-related in male rats at 10% and female rats at 5% and 10%. Other findings such as slight increases in total bile acids in males, and minor changes in albumin and urea nitrogen in male and female rats were not considered to be treatment-related.

Minor haematological changes were noted, including decreases in mean corpuscular hemoglobin concentration (MCHC), mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH) and increase in platelets count in males, and decrease in reticulocytes in females. However, these changes were not considered to be biologically significant.

Pathology:
Both absolute and relative liver weights were increased in males at 10% dietary dose.

There was no statistical difference of absolute heart weights in males, however, the heart/bodyweight ratio was higher than the controls in males at 0.62, 2.5 and 10% dose levels. The differences in bodyweight among animals were relatively small, and no corresponding morphological changes were found under microscopic examination. Hence,

these changes were not considered to be treatment-related.

A slight decrease in epididymal weight was observed in the male 5% and 10% dose groups, but it was not dose-related. Castor oil did not produce any effects on other male (testis weight, sperm count or sperm motility) or female (oestrous cycle length, or time spent in each phase of the cycle) reproductive endpoints.

Histopathologic examination did not show any treatment-related lesions in organ or tissue in treated rats.

Comment:	The minor changes in liver weight were not accompanied by any corresponding histopathological lesions or clinical chemistry parameters indicative of liver toxicity. Also statistically significant enzyme changes were confined to increased alkaline phosphatase activity in the serum of male and female rats at high doses. These observations are consistent with an increase in the metabolic activity associated with increased lipid absorption rather than a toxic response.
Result:	A NOAEL for Castor oil in rats was established at 5 725 mg/kg/day based on the absence of specific organ or systemic toxicity in the study.

Part 2: Mouse Study

Species/strain:	Mouse/B6C3F$_1$
Number/sex of animals:	10/sex/group
Method of administration:	dietary
Dose/Study duration::	0, 0.62, 1.25, 2.5, 5, and 10% Castor oil in feed mixture for 13 weeks. Actual doses (mg/kg bodyweight/day) were 0, 917, 2 022, 3 800, 7 823 and 15 017 in males and 0, 1 153, 2 282, 5 009, 9 627 and 16 786 in females.
Test method:	Similar to OECD TG 407

Clinical observations:
All mice survived. No treatment related effects were observed in food consumption in both male and female rats. Generally, mean bodyweights of exposed males were lower than the controls, while mean bodyweights of exposed females were higher. Bodyweights of male mice at 10% dose were consistently lower than that of the controls from week 3 through the end of the study.

Pathology:
A slight increase in liver weights was observed in both male and female mice at 5% and

10% dose levels. Kidney weights were increased slightly in females at 5% and 10% dose levels. Microscopic examination did not reveal any morphologic findings associated with the slight differences between groups in organ weights. Histopathologic examination did not show any treatment-related lesions in organ or tissue among treated mice.

There were no effects of Castor oil observed in reproductive parameters among male and female mice.

Comment: Clinical chemistry and haematology tests were not performed in this study.

The minor changes in liver and kidney weight were not accompanied by any corresponding histopathological lesions. Therefore these changes are likely to be related to increased metabolic activity rather than a toxic response.

Result: Under the conditions of the study, NOAEL for Castor oil in mice was 15 000 mg/kg/day based on the absence of specific organ toxicity.

9.1.3 Genotoxicity

9.1.3.1 *Salmonella typhimurium* Reverse Mutation Assay (Zeiger et al., 1988; Irwin, 1992)

Strains: TA97, TA98, TA100, and TA1535

Concentration range: 0, 100, 333, 1 000, 3 333 and 10 000 μg/plate (vehicle: DMSO).

Metabolic activation: Both S9 metabolic activation systems from Aroclor 1254-induced hamster liver and Aroclor 1254-induced rat liver were used at 10% and 30%.

Test method: OECD TG 471

Comment: The study was performed by SRI International. At all doses, the number of revertants/plate was similar to the controls. There were 2 sets of study data without S9. In the presence of S9, 2-aminoanthracene was used as positive for all strains. In the absence of S9, 4-nito-o-phenylenediamine, sodium azide and 9-aminoacridine were used on TA98, TA100/TA1535, and TA97, respectively. All positive controls had appropriate responses. No cytotoxicity was observed in the study.

Result: Castor oil was not mutagenic in *S. typhimurium* under the

study conditions.

9.1.3.2 Chromosome Aberration Study with Chinese Hamster ovary Cell in vitro (Galloway et al., 1985; Galloway et al., 1987; Irwin, 1992)

Cell culture:	Chinese hamster ovary (CHO) cells
Concentration range:	0, 1 600, 3 000 and 5 000 μg/mL (vehicle: DMSO) with and without metabolic activation.
Metabolic activation:	S9 metabolic activation system was prepared from livers of Aroclor 1254–induced male Sprague-Dawley rats.
Test method:	Similar to OECD TG 473
Comment:	The study was performed at Environment Health Research & Testing Inc. At all doses, the number of aberrations was similar to that of the solvent control, with and without metabolic activation. Mitomycin-C and cyclophosphamide served as positive controls for the studies without and with S9, respectively. The positive controls had appropriate responses.
Result:	Castor oil did not induce chromosomal aberrations in cultured CHO cells under the study conditions.

9.1.3.3 Sister Chromatid Exchange Study with Chinese Hamster ovary Cell in vitro (Galloway et al., 1985; Galloway et al., 1987; Irwin, 1992)

Cell culture:	Chinese hamster ovary (CHO) cells
Concentration range:	0, 160, 500, 1 600, and 5 000 μg/mL (vehicle: DMSO) with and without metabolic activation.
Metabolic activation:	S9 metabolic activation system was prepared from livers of Aroclor 1254–induced male Sprague-Dawley rats.
Test method:	Similar to OECD TG 479
Comment:	The study was performed by Environment Health Research & Testing Inc. At all doses, the number of SCEs per chromosome was similar to that of the solvent control. Mitomycin-C and cyclophosphamide served as positive controls for the studies without and with S9, respectively.

	The positive controls had appropriate responses.
Result:	Castor oil did not induce sister chromatid exchanges in cultured CHO cells under the study conditions.

9.1.3.4 Micronucleus Assay in Peripheral Blood Erythrocytes of Mice (MacGregor et al., 1983a &b; Irwin, 1992)

Species/strain:	Mouse/B6C3F$_1$
Number and sex of animals:	10/sex
Doses:	0, 0.6, 1.3, 2.5, 5.0 and 10.0% in feed for 13 weeks
Method of administration:	dietary
Test method:	Similar to OECD TG 474
Comment:	No significant increase in the frequency of micronucleus erythrocytes was observed at any dose. Urethane was given in water (0.2%) to 3 male mice for 4 weeks to be served as the positive control. The positive had appropriate response despite not being a part of the 13-week study.
Result:	Castor oil did not produce micronuclei in the polychromatic erythrocytes in mice under the study conditions.

9.2 Trimethylolpropane

9.2.1 Summary of Toxicity Studies

Trimethylolpropane (CAS no. 77-99-6) is a white powder with a melting point of 58°C. Trimethylolpropane has a low acute oral toxicity in rodents (LD_{50}=8 355-14 700 mg/kg), and a very low dermal LD_{50} in rabbits of > 10 000 mg/kg. Four hour inhalation exposure in rats showed a LC_{50} was greater than 2 000 mg/m^3. Trimethylolpane is practically non-irritating to eyes in rabbits.

Repeated dermal application (0.5 mL of a 50% solution) for 3 months in rabbits did not produce any toxic effects. No toxic effects including bodyweight gain were observed in rats after administration of 1.5-3 mg trimethylolpropane/kg/day in diet.

9.3 Structure activity relationship (SAR) analysis

A QSAR model, TOPKAT (from Health Designs Inc., Rochester, NY), was used to estimate acute oral toxicity and genotoxicity for Castor oil, trimethylolpropane and Caspol 1962 (KG16470). As ricinoleic acid comprises greater than 87% of Castor oil, the structure of ricinoleic acid was used for Castor oil in the estimation.

The estimated oral LD_{50} in rats for trimethylolpropane, ricinoleic acid and Caspol 1962 were 6 400 mg/kg, >10 000 mg/kg and >10 000 mg/kg, respectively. Both trimethylolpropane and Caspol 1962 were predicted to be non-mutagenic.

9.4 Overall Assessment of Toxicological Data

Based on the toxicological data available for two related chemicals, castor oil and trimethylolpropane, the notified chemical would be expected to have the following toxicological profile.

Acute toxicity Both castor oil and trimethylolpropane have very low acute toxicity by all routes, so the notified chemical would be expected to have very low acute toxicity by all routes.

Irritation Based on the absence of irritant effects in humans for castor oil and the low level of irritation to rabbit eye for trimethylolpropane, the notified chemical would be at most a slight skin and eye irritant.

Skin sensitisation. A number of cases of contact dermatitis have been observed in humans exposed to castor oil, however, no animal studies were available. No sensitisation data were available for trimethylolpropane. Therefore, the notified chemical may possess some sensitisation potential.

Repeated dose toxicity. In two 13-week NTP studies conducted in rats and mice, no specific organ or systemic toxicity was observed at doses up to 5725 and 15000 mg/kg/d, respectively. Minor changes in liver weight and alkaline phosphatase activity were observed in the rat study, however, these were consistent with changes in metabolic activity rather than a toxic response. No significant effects on reproductive parameters were observed in both studies.

No significant effects have been revealed in a limited number of other repeated dose studies with castor oil and trimethylolpropane. Based on the these results, repeated exposure to the notified chemical is unlikely to result in chronic toxicity.

Genotoxicity. Based on the absence of genotoxic effects in a number of *in vitro* and *in vivo* studies with castor oil, and the QSAR predictions, the notified chemical is not expected to be genotoxic.

Based on its predicted toxicity, the notified chemical cannot be classified as a hazardous substance in accordance with the NOHSC *Approved Criteria for Classifying Hazardous Substances* (National Occupational Health and Safety Commission, 1999a). In the absence of

confirmative test data, the evidence for skin sensitisation is insufficient to warrant classification.

10. ASSESSMENT OF ENVIRONMENTAL EFFECTS

No ecotoxicology data were provided. However, the physico-chemical properties of major components of the notified chemical, calculated by the notifier and the Syracuse Research Corp. software indicate that the chemical will be very insoluble in water and consequently aquatic toxicity is likely to be low. The notified chemical will also partition readily to soil; bioaccumulation in aquatic systems is, therefore, not expected.

11. ASSESSMENT OF ENVIRONMENTAL HAZARD

The notified chemical cross-links with other paint components to form a very high molecular weight and stable film that adheres firmly to the primer layer to which it is applied. The notified chemical, as part of this surface coating, will therefore share the fate of the vehicle panel. The paint will slowly deteriorate under the action of UV light, but this is expected to be negligible over the life of the heavy truck and equipment surfaces. When the vehicle panel is recycled, the notified chemical would be destroyed through incineration.

The notifier has put forward a concise account of the life cycle of the notified chemical from importation to end-use as an automotive binder resin. It is also noted that no repackaging of the notified chemical will occur and it will only be supplied to licensed professional spray painters who will formulate with pigments and activator on site directly prior to use. Overspray will be captured and disposed of to landfill as will paint residues in empty cans. Equipment residues will be washed with solvent and sent for solvent recycling and disposal of solid residues, again, to landfill. The paint film will contain the notified chemical as part of a crosslinked matrix. The final fate of the notified chemical will presumably be the same as the final fate of the vehicle. That is either to landfill or to recycling where it will be incinerated to water vapour and oxides of carbon.

In the event of accidental spillage of the resin solution into waterways, while of low molecular weight, the chemical is not expected to disperse into the water, but settle out onto sediments. If the chemical is spilt on land, either during usage or transport, it is expected that the chemical would become immobilised in the soil layer. Contaminated soil can then be collected and disposed to landfill. The small container sizes would also limit any hazard in the event of a spill.

Given the above, environmental exposure and the overall environmental hazard is expected to be low.

12. ASSESSMENT OF PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY EFFECTS

No toxicological data on the notified chemical have been submitted. Based on the information for two related chemicals, the notified chemical is unlikely to be classified as a hazardous substance according to NOHSC *Approved Criteria for Classifying Hazardous Substances* (National Occupational Health and Safety Commission, 1999a).

The notified chemical will be imported as a component of the product, Imron 6000 8960S Binder. The product contains methyl amyl ketone, which is on the NOHSC *List of Designated Hazardous Substances* (National Occupational Health and Safety Commission, 1999b). In addition, NOHSC has established exposure standards (National Occupational Health and Safety Commission, 1995) for the product components isopropyl alcohol (TWA 983 mg/m^3), methyl n-amyl ketone (233 mg/m^3) and ethyl acetate (1 440 mg/m^3).

According to the Material Safety Data Sheet (MSDS) provided for the product, the product will produce gastro-intestinal distress on ingestion and may also be an eye and skin irritant. Inhalation may cause respiratory irritation and central nervous system depression. Prolonged overexposure may cause permanent brain and nervous system damage. These effects relate mainly to the solvents and additives, rather than the notified chemical.

Occupational Health and Safety
There is little potential for significant occupational exposure to the notified chemical in the transport and storage of the paint product containing this chemical. As the product is classified as a Class 3 Dangerous Good, the ADG code requires chemically resistant gloves or gauntlets and electric torch complying with AS2380.7 or other approved Code to be carried on road vehicles. The greatest exposure is in the use and disposal of the paints.

The final paint mix, including the pre-prepared paint containing the notified chemcial, could contain a wide variety of additional ingredients once fully mixed. This is likely to introduce human health hazards because, apart from a range of potentially toxic solvents, there may be components containing resins with pendant isocyanate groups. The spraying procedure also produces a dense aerosol of paint particles, which would adversely affect human health even in the absence of additional hazardous components. It is also probable that professionals involved in the spray painting industry will use a number of different paint formulations.

For these reasons, the notified chemical must be assessed for the contribution it makes to the hazards associated with use of the spray paints. The presence of many potential and actual hazardous substances in the formulation requires the use of stringent engineering controls, such as a correctly constructed and maintained spray booth, and a high level of personal protective equipment, such as impermeable overalls, gloves, full face shield and goggles during mixing and cleaning. A respirator should be used during spraying operation. The use of the paint containing the notified chemical should be in accordance with the NOHSC *National Guideline Material for Spray Painting* (NOHSC, 1999c). The level of protection from exposure afforded by the standard protective measures will provide adequate protection from the notified chemical, which is likely to be less intrinsically toxic than most of the solvents, pigments and other paint resins.

Once the applied final paint mix has hardened, the chemical will not be separately available for exposure or absorption.

There are NOHSC exposure standards for the components identified as ingredients in the pre-prepared paint product (National Occupational Health and Safety Commission, 1995). The employer is responsible for ensuring that these exposure standards, and exposure standards pertaining to other final paint mix additives, are not exceeded in the workplace.

The paint product containing the notified chemical are flammable due to their solvent content. Precautions must be taken to avoid sources of ignition, e.g. use of earthing leads. Operators should wear antistatic overalls and footwear.

Similar considerations apply in the disposal of the chemical. The wastes containing the notified chemical may be hazardous substances on the basis of the solvent and other resin content, and the precautions used on the basis of these additional materials should be adequate for protection from the notified chemcial. In addition, much of the chemical will be crosslinked, hardened and immobilised by the time of disposal.

Public Health
The notified chemical in the paint formulation will be used only in heavy vehicle and equipment coatings. Although members of the public will make dermal contact with vehicles and equipment coated with products containing the notified chemical, exposure will be negligible because of the cured state of the notified chemical in the coatings, from which the notified chemical is not likely to be bioavailable. It is considered that the notified chemical will not pose a significant hazard to public health when used in the proposed manner.

13. RECOMMENDATIONS

Occupational Health and Safety
To minimise occupational exposure to KG16470 the following guidelines and precautions should be observed:

- Use of the paint containing the notified chemical should be in accordance with the NOHSC *National Guidance Material for Spray Painting* (NOHSC, 1999c);

- Employers should ensure that NOHSC exposure standards for all of the components of the final paint mix are not exceeded in the workplace;

- 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 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.

Public Health
To minimise public exposure to KG16470 the following guidelines and precautions should be observed:

If the conditions of use are varied from the notified use (as a coating for automobile bodies), greater exposure of the public may occur. In such circumstances, secondary notification may be required to assess the hazards to public health.

14. MATERIAL SAFETY DATA SHEET

The MSDS for the Imron 6000 8960S Binder, the product containing the notified chemical, was provided in a format consistent with the NOHSC *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 may be required if any of the circumstances stipulated under section 64 of the Act arise. No other specific conditions are prescribed.

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