

File No: NA/432

Date: August 1996

**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION  
AND ASSESSMENT SCHEME**

**FULL PUBLIC REPORT**

**Copolymer in E5723**

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 Worksafe Australia which also conducts the occupational health & safety assessment. The assessment of environmental hazard is conducted by the Department of the Environment, Sport, and Territories and the assessment of public health is conducted by the Department of Health and Family 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 10.00 a.m. and 12.00 noon and 2.00 p.m. and 4.00 p.m. each week day except on public holidays.

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Director  
Chemicals Notification and Assessment

**FULL PUBLIC REPORT****Copolymer in E5723****1. APPLICANT**

Ethyl Asia Pacific Company Pty Ltd of 20 Berry Street Level 12 North Sydney NSW 2060 has submitted a limited notification statement for an assessment certificate for Copolymer in E5723.

**2. IDENTITY OF THE CHEMICAL**

Copolymer in E5723 is not considered to be hazardous based on the nature of the chemical and the data provided. Therefore the chemical name, CAS number, molecular and structural formulae, molecular weight, spectral data and details of the polymer composition have been exempted from publication in the Full Public Report and the Summary Report.

**2. IDENTITY OF THE CHEMICAL**

**Trade name:** E5723, dispersant olefin copolymer in oil

**Number-Average  
Molecular Weight:** > 1000

**Maximum percentage of low  
molecular weight species  
< 1000 and 500:** approximately 5% of the starting polymer has a molecular weight < 5000. It has been deducted from the fact that the starting polymer is distilled at 208°C, that very low concentrations of particles are below 500 and 1000

**Method of detection  
and determination:** no specific analytical methods are available for this polymer, an infrared (IR) spectrum for Copolymer in E5723 (in oil) was provided

### Comments on Identity

No CAS number has been assigned to this chemical. It is referenced on the US EPA TSCA confidential inventory via Accession Number 104520.

The 5% polymer below 5000 molecular weight was determined by using a vapour pressure osmotic method with gel permeation chromatography. The submission states the starting polymer is believed to be distilled at around 298°C and it is assumed very low concentrations of polymer below 500 and 1000 molecular weight would exist. The above method is not suitable to measure low concentrations of low molecular weight polymers.

### 3. PHYSICAL AND CHEMICAL PROPERTIES

The notified polymer is synthesised overseas in the presence of diluent oil and is not isolated during the manufacturing process. Consequently, all analytical data are for E5723, the polymer in diluent oil.

<b>Appearance at 20°C and 101.3 kPa:</b>	dark viscous liquid, amine like odour
<b>Boiling Point:</b>	unknown but expected to be very high based on the molecular weights of the synthetic polymer and the diluent oil
<b>Specific Gravity:</b>	870 kg/m <sup>3</sup>
<b>Vapour Pressure:</b>	not provided, however expected to be that of the diluent oil < 0.1 mm Hg (0.013 kPa at 25°C)
<b>Water Solubility:</b>	estimated to be < 0.1% w/w
<b>Partition Co-efficient (n-octanol/water):</b>	not provided but expected to partition to the hydrophobic compartment due to base oil
<b>Hydrolysis as a function of pH:</b>	not provided but this polymer is not expected to readily hydrolyse at ambient temperature based on the structure of the polymer functionality
<b>Adsorption/Desorption:</b>	not provided but this polymer is not expected to readily hydrolyse at ambient temperature based on the structure of the polymer functionality
<b>Dissociation Constant:</b>	expected to be low because of the chemical functionality. It has one basic nitrogen but dissociation would be hard to measure in view of the low water solubility

<b>Flash Point:</b>	193°C (Cleveland Open Cup )
<b>Flammability Limits:</b>	not available
<b>Autoignition Temperature:</b>	not provided, but is expected to be similar to that of similar base oil products (approximately 354°C)
<b>Explosive Properties:</b>	does not exhibit explosive properties when exposed to heat, friction or flame
<b>Reactivity/Stability:</b>	reacts vigorously with strong oxidisers, but not with air, water or under normal heating conditions

### **Comments on Physico-Chemical Properties**

On combustion the notified polymer produces carbon monoxide and carbon dioxide.

It should be noted, the company states there are no intermediate streams which contain the final polymer in a concentrated form. Consequently the notifier is not able to provide analytical or toxicity data on the pure polymer.

The following comments on physico-chemical properties have been provided by the company:

The exact boiling point has not been determined. However the product has a very high boiling point based on the molecular weights of the synthetic polymer and the diluent oil.

The vapour pressure will be very low based on the molecular weight of the polymer and the diluent oil.

Water solubility has not been determined but will be very low based on the molecular weight and structure of the polymer and diluent oil. The maximum water solubility for the product is estimated to be less than 0.1% in water.

Hydrolysis has not been determined. The polymer should not readily hydrolyse under environmental conditions.

Dissociation constant has not been determined. This polymer should have a very low dissociation constant based on the chemical functionality. It has one basic nitrogen but dissociation would be hard to measure in view of the low water solubility.

#### 4. PURITY OF THE CHEMICAL

**Degree of purity:** high

**Toxic or hazardous impurities:**

All the hazardous impurities (listed in 1,2 3) are at levels below which a hazardous classification is required according to Worksafe Australia's *List of Designated Hazardous Substances* (4).

**Maximum content of residual monomers:** < 0.1%

**Non-hazardous impurities (> 1% by weight):** none

**Additives/Adjuvants:**

<i>Chemical name:</i>	mineral oil, petroleum distillates, solvent-dewaxed heavy paraffinic
<i>Synonyms:</i>	distillates (petroleum), solvent-dewaxed heavy paraffinic (9CI) distillate; SNO-100 oil
<i>CAS No.:</i>	64742-65-0
<i>Weight percentage:</i>	approximately 84, range 80.01 - 89%
<i>Toxic properties:</i>	mineral oils (untreated and mildly treated oils) are listed as a carcinogen group 1 by IARC (5); i.e sufficient evidence of carcinogenic potential in humans; however, unspecific nature of IARC category indicates that applicability to this chemical is open to review; a specific exposure standard is not listed by NOHSC (6) but for refined mineral oil mist (CAS # 8012-95-1) there is an exposure standard of 5 mg/m <sup>3</sup> .

#### 5. USE, VOLUME AND FORMULATION

The notified polymer will be imported into Australia as a solution in diluent oil which is in turn a component of lubricant oil additive packages. It will be used as a viscosity index improver for gasoline and diesel engine motor oils. The viscosity index improvers are normally used to formulate a multigrade motor oil and control the viscosity for all-seasons performance. The polymer will also act as an antioxidant and dispersant to solubilise sludge and inhibit sludge formation in motor oils. The notified polymer will be incorporated into motor oils at a final concentration of < 5% by weight.

The estimated quantity of the notified chemical to be imported is 500-1000 tonnes in the first year and 500-1500 tonnes per annum over the next four years.

The crankcase lubricants containing the notified polymer are used in petrol engines (predominantly passenger car motor vehicles and light commercial vehicles) and diesel engines (approximately 55% total diesel oil sales to on-highway trucks and 45% to off-highway equipment). The off-highway diesel oil sales comprise approximately 80% for mobile trucking equipment and 20% to stationary equipment largely for power generation in large mining operations.

The fully formulated lubricants are manufactured by a physical blending process involving mixing of additive packages containing the notified polymer with lubricating oil basestocks and other additive packages. The notified polymer in the formulated product provides viscosity index improvement and some dispersion and antioxidant properties. The viscosity index improvers are normally used to formulate a multigrade motor oil and control the viscosity for all-seasons performance. The notified polymer in a solution of diluent oil also acts to inhibit oxidation of a lubricant, disperse sludge and inhibit the formation of sludge precursors.

Copolymer in E5723 is currently used in the United States, major European countries and in Central and Southern American countries.

## **6. OCCUPATIONAL EXPOSURE**

Copolymer in E5723 will be imported in large 205 litre metal drums or in bulk liquid tanks. The bulk liquid will be shipped in containers in approximately 20 tonne parcels or in chemical parcel tankers in 150 to 400 tonne lots. The parcels will then be transported by road and rail to approximately 25 separate locations.

Worker exposure may occur during the following activities:

- . unloading the additive packages from the vessel at the port
- . transportation of the containers from the port to the storage tanks, warehouses or lubricant oil manufacturer's blending plants
- . blending operations at the lubricant oil manufacturer's blending plants
- . maintenance of pumps and associated equipment at all locations

Approximately 2-5 workers will be involved at each location. Worker exposure is estimated at 1 hour/day for the sampling operation, 4 hour/day for tanker loading/unloading and drum filling, and 4 hour/day for blending operations for approximately 220 days/year. The blending procedure involves the introduction of E5723 into a heated blending kettle containing a stirrer, followed by the addition of premixed additives via a pump. The notifier states that exposure levels will be minimal during blending operations due to the use of contained liquid handling systems.

After reformulation the blended motor oil will be packaged and sold to automotive outlets. The motor oil will contain < 5 weight % of the polymer but typically less in an SAE 20W50 multigrade motor oil.

## **7. PUBLIC EXPOSURE**

On arrival, containers will be transported by road and rail to approximately 25 lube oil manufacturing/blending plants. There is low potential for public exposure during shipment and transportation. In the event of accidental release, the Material Safety Data Sheet (MSDS) specifies that spills should be contained and wiped up or absorbed onto suitable material before collection. Entry into sewers and waterways is to be prevented.

At the blending plants, the formulation is transferred by contained liquid handling systems into a heated blending kettle where it is blended with mineral oil and other premixed additives. The formulated lube oil product will be sold to automotive outlets and will contain approximately < 5% w/w of the notified polymer. Waste material and spills will be contained by bunding or solid adsorbent, and processed by the API separator system to separate the oil or immiscible material from the water stream. The water stream is further treated before being discharged to the outfall. The oil-based layer will be incinerated as bunker fuel oil. Sludge residues are mixed with activated clay, taken by licensed industrial waste groups for ultimate disposal by landfill or incineration.

The public may come into contact with the blended chemical in the final commercial motor oil product, when it is used in automobile crankcases.

## **8. ENVIRONMENTAL EXPOSURE**

### **Release**

The imported drums and parcels of the notified polymer in the additive packages are stored at warehouses and storage locations operated by transport companies and chemical storage companies largely in the major capital city environs.

Waste streams containing the notified polymer are confined to slops, washings and spills and are contained within bunded areas for adequate treatment or disposal to prevent entry into sewers and waterways.

The notifier stated the spilled material is washed into a separator, a fully enclosed system comprising a series of baffle units and a skimmer to separate oil or immiscible material from the carrier water stream, followed by a unit consisting of adsorbent polypropylene (oleophilic) mats to remove the oil sheen. The water stream is further treated to ensure pH, BOD, sulphides etc comply with the parameters contained within the EPA (State) license before discharge to the outfall.

The residues from the skimmer unit pass to tanks for settling and dewatering. The oil based layer is incinerated typically as bunker fuel oil. Sludge residues are mixed with activated clay and taken by licensed industrial waste groups for ultimate disposal by land fill or incineration. Oil or product spills containing the notified polymer may also be treated with solid adsorbent and disposed of in the same manner by the licensed industrial waste groups.

In the lube oil blending process it is estimated that typically a 0.2% product loss may be experienced or 40 kg blended oil in a 20 t blend batch containing < 5 wt % of the notified polymer. For example, 0.4 kg of polymer may be released as slops or washings during transfers to storage tanks and filling lines, unloading additive from drums or bulk road tankers and sampling for testing purposes. These liquid releases are contained and controlled in appropriate compounds or pits for treatment or disposal. Over one year the amount of polymer released would be ~3000 kg (worst case situation - based on 1500 t imported per annum).

The polymer may also be released to the environment through exhaust emissions, leakage and disposal of used oil.

The notifier has stated that during engine use the chemical is oxidised to combustion products. The amount lost, which is not burned, is probably not measurable, and to the notifier's knowledge has never been determined. The notifier expects this quantity to be no different than with other engine lubricants.

It should be noted that oil emissions with the exhaust are very low (7) and the level of unoxidised polymer is likely to be higher from oil leakage from crankcase lubricated engines and the disposal of used oil.

Oil leaks have a tendency to accumulate in the environment, resulting in a significant environmental load (7). One-third of the lubricating oil sold is lost during use; some is lost on the pavement surface, in the streets, roads and in car parks. The oil remains on these surfaces until stormwater or the municipal services wash the oil off, when it is transported by stormwater drains to waterways or the ocean of urban zones, or to adjacent soils from roads in non-urban areas (8).

The notifier has stated that losses of the polymer during motor oil changes would not be expected to be any different than losses experienced with other motor oils. Used lubricant handling guidelines stress minimising personal contact and disposal in an environmentally acceptable manner. However, it should be noted a report on used lubricating oil in Australia (9) indicates that lubricating oil not collected for recycling or reuse on site as a fuel or lubricant amounts to 22% of total sales. The methods of disposal of used oil includes dust and vegetation control, and dumping in sewers and landfill.

## **Fate**

The notifier has stated that waste polymer from the blending process is prevented from entry into sewers and waterways.

The notified polymer will enter the environment when waste polymer from the blending process is disposed of by land fill or incineration. When the polymer is land filled it is likely to remain at the site of deposition. Leaching of the polymer is unlikely due to its large molecular weight, expected low water solubility and likely adsorption to soil. Incineration of the polymer is unlikely to produce toxic compounds.

The amount of polymer released to the environment through the exhaust emissions is likely to be low as the chemical is oxidised during combustion and any emissions



can be expected to become associated with the soil compartment (including sediment).

Any unoxidised polymer which enters the environment from engine oil leakage and is lost on the pavement surface, in the streets, roads and in car parks is washed off (by rain or the municipal services) and is transported by stormwater drains in the case of urban zones to waterbodies and become associated with the sediment. When the polymer is washed off roads to adjacent soils, it is likely to accumulate at the site of deposition unless erosion events transport it to water bodies where it is likely to become associated with the sediment.

The fate of the polymer in lubricating oils lost during use in motor vehicles, diesel trucks compared to off-highway diesel engines is likely to be different. The main difference will occur where off-highway diesel engines are stationary, as this will result in the continual emission of the polymer and products of its combustion at a specific point in the environment.

The amount of unoxidised polymer in used oil is unclear. However, the potential exists for a significant portion of oil containing the polymer to be disposed of in an environmentally unacceptable manner (eg dust and vegetation control, and dumping in sewers and landfill). Any unoxidised polymer in used oil that is used for dust and vegetation control are likely to remain at the site of application until erosion events transport the polymer to waterbodies, where the polymer is likely to become associated with the sediment. The polymer is unlikely to leach when it is dumped at landfills. The dumping of the polymer in sewers is likely to result in the polymer becoming associated with sludge during treatment.

#### Hydrolysis

The polymer contains succinimide linkages which may be susceptible to hydrolysis. However, it is unlikely that the polymer would be readily degraded by hydrolysis under environmental conditions because of limited solubility.

#### Biodegradation

No information has been provided by the company. The presence of succinimide linkages in the polymer indicate it would be vulnerable to cleavage in vivo with subsequent elimination. However, the polymer is unlikely to be readily biodegraded under environmental conditions.

#### Bioaccumulation

The high molecular weight of the polymer (> 1000) indicates it is unlikely to bioaccumulate.

## 9. EVALUATION OF TOXICOLOGICAL DATA

### 9.1 Acute Toxicity

The Act does not require the provision of toxicology data for polymers where the number-average molecular weight (NAMW) exceeds 1,000. However, the following tests have been conducted and were submitted as part of the notification statement.

#### Summary of the acute toxicity of Copolymer in E5723 (in oil)

<b>Test</b>	<b>Species</b>	<b>Outcome</b>	<b>Reference</b>
skin irritation	rabbit	slight irritant	10
eye irritation	rabbit	slight irritant	14

#### 9.1.1 Skin Irritation (10)

*Species/strain:* New Zealand white rabbits

*Number/sex:* 3/3

*Observation period:* 9 days

*Method of administration:* 0.5 ml of Copolymer in E5723 in oil

#### *Draize scores (11):*

<b>Time after treatment (days)</b>	<b>Animal #</b>					
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
<b>Erythema</b>						
1	<sup>a</sup> 1	2	2	1	2	2
3	1	2	1	1	2	2
<b>Oedema</b>						
1	0	1	0	0	0	0
3	0	0	0	0	0	0

<sup>a</sup> see Attachment 1 for Draize scales

*Test method:* similar to OECD Guidelines for Testing Chemicals (12)

*Result:* slight irritant, however not classified as hazardous according to Worksafe Australia *Approved Criteria for Classifying hazardous Substances* (13)

### 9.1.2 Eye Irritation (14)

*Species/strain:* New Zealand white rabbit

*Number/sex of animals:* 3/3

*Observation period:* 14 days

*Method of administration:* 0.1 ml in conjunctival sac of one eye of each animal

*Draize scores (11) of unirrigated eyes:*

	Time after instillation														
Animal	1 day		2 days		3 days		7 days		14 days						
Cornea	o <sup>a</sup>	a <sup>b</sup>	o <sup>a</sup>	a <sup>b</sup>	o <sup>a</sup>	a <sup>b</sup>	o <sup>a</sup>	a <sup>b</sup>	o <sup>a</sup>	a <sup>b</sup>					
1	10	0	0	0	0	0	0	0	0	0					
2	0	0	0	0	0	0	0	0	0	0					
3	0	0	0	0	0	0	0	0	0	0					
4	0	0	0	0	0	0	0	0	0	0					
5	0	0	0	0	0	0	0	0	0	0					
6	0	0	0	0	0	0	0	0	0	0					
Iris															
1		0		0		0		0		0					
2		0		0		0		0		0					
3		0		0		0		0		0					
4		0		0		0		0		0					
5		0		0		0		0		0					
6		0		0		0		0		0					
Conjunctiva	r <sup>c</sup>	c <sup>d</sup>	d <sup>e</sup>	r <sup>c</sup>	c <sup>d</sup>	d <sup>e</sup>	r <sup>c</sup>	c <sup>d</sup>	d <sup>e</sup>	r <sup>c</sup>	c <sup>d</sup>	d <sup>e</sup>	r <sup>c</sup>	c <sup>d</sup>	d <sup>e</sup>
1	2	0	0	1	1	0	0	1	0	1	0	0	1	0	0
2	1	1	1	1	1	0	0	1	0	0	0	0	0	0	0
3	2	1	1	1	1	0	1	1	0	0	0	0	0	0	0
4	2	1	0	1	1	0	0	1	0	0	0	0	0	0	0
5	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0
6	1	1	0	0	1	0	0	1	0	0	0	0	0	0	0

<sup>1</sup> see Attachment 1 for Draize scales

<sup>a</sup> opacity <sup>b</sup> area <sup>c</sup> redness <sup>d</sup> chemosis <sup>e</sup> discharge

*Test method:* similar to OECD Guidelines for Testing Chemicals (12)

*Result:* slight irritant, however not classified as hazardous according to Worksafe Australia *Approved Criteria for Classifying hazardous Substances* (13)

## **9.2 Overall Assessment of Toxicological Data**

The toxicity data presented for E5723 indicate that the substance is a slight skin and eye irritant. However, these effects are likely to be due to the diluent oil and solubilisers present in E5723, which are known irritants, rather than to the notified polymer. The Draize scores for both the eye and skin irritation studies are below the levels specified for hazardous classification in Worksafe Australia's *Approved Criteria for the Classification of Hazardous Substances* (13). On this basis the notified chemical would not be classified as hazardous.

## **10. ASSESSMENT OF ENVIRONMENTAL EFFECTS**

Since the chemical being notified is a polymer of greater than 1000 molecular weight, environmental effects information is not required.

## **11. ASSESSMENT OF ENVIRONMENTAL HAZARD**

The loss of the polymer from the blending process is likely to present negligible hazard to the environment as only ~3000 kg is likely to be released each year, spread over a number of sites across Australia, and the notifier states that waste is prevented from entering sewers and waterways. The disposal of the waste polymer from the blending process by land fill or incineration is unlikely to present a hazard to the environment.

Emissions during engine use are unlikely to present a hazard to the environment as the amount of intact polymer being lost is likely to be very low due to the oxidation of the polymer during combustion.

The hazard to the environment from the leaking of oil from engines and the disposal of used oil containing the polymer in an environmentally unacceptable manner (eg dust and vegetation control, and dumping in sewers and landfills) is likely to be low because:

The release will be dispersed across Australia (predominantly in the urban regions) and the environmental concentration of the polymer should be very low (below 1 ppb);

The bulk of this release is likely to become associated with soil/sediment;

The toxicity of such modified polyalkylene copolymers is low because of low bioavailability; and

Where the polymer is contained in urban and rural runoff and enters aquatic environments, the expected very low concentration of the polymer and its high molecular weight (> 1000) indicates it is unlikely to present a hazard to organisms inhabiting these environments.

## **12. ASSESSMENT OF PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY EFFECTS**

The notified chemical is a high molecular weight polymer (NAMW > 1000) and therefore unlikely to be absorbed across biological membranes such as the skin, gut and respiratory tract. Toxicity data on Copolymer in E5723 (in oil) indicate that it has some potential for eye and skin irritation. However, these effects are likely to be due to the diluent oil and solubilisers which are present in the Copolymer in E5723 formulation in oil and known to cause these effects, in addition, the levels of irritation in rabbit eye and dermal studies are below that requiring a hazardous classification according to the Worksafe Australia criteria (13). Workers involved in formulating operations (11 - 20% of the notified polymer) and mechanics using motor oil (< 5% w/w of the notified polymer) if sufficiently exposed to the product containing the polymer may suffer skin and eye irritation. The negligible amount of impurities and residual monomers present in the polymers are unlikely to pose a significant health hazard.

As the polymer will be present in diluent oil which is more hazardous than the polymer, the methods proposed by the notifier to reduce exposure to the diluent oil will also be sufficient to reduce exposure to the polymer. It is not possible to classify the additive/adjuvant mineral oil and hence the imported formulation E 5723 on the basis of literature data. On the basis of actual toxicological tests as described above it would not be classified as hazardous according to the criteria of Worksafe Australia (13). The following information is however of relevance.

Mineral oils (untreated and mildly treated oils) are listed as a carcinogen group 1 by IARC (5); i.e there is sufficient evidence of carcinogenic potential in humans. However, the unspecific nature of the IARC category indicates that the applicability to the mineral oil in the formulation E5723 is open to review; a specific exposure standard is not listed by NOHSC (6) but for refined mineral oil mist (CAS # 8012-95-1) there is an exposure standard of 5 mg/m<sup>3</sup>.

The notified chemical, Copolymer in E5723, is stable in ambient conditions, has negligible vapour pressure, low water solubility and is not explosive, and therefore should not present a significant hazard to workers.

The major route of exposure to the notified polymer will be dermal. Exposure during transport and storage is considered unlikely except in the event of spillage or leaks, as the polymer will be contained in secure containers. Workers may come into direct contact with the notified chemical during the reformulation process and dermal contact may be high if personal protection is not implemented. Mechanics may also come into direct contact with the polymer through handling of motor oils. However, the concentration of the notified polymer in the motor oils is low at < 5% w/w.

The public may be exposed to Copolymer in E5723 in the final blended commercial product, which is to be used in automobile crankcases. However the exposure is likely to be infrequent and skin contact will be to small amounts only.

Based on the above information, it is considered that Copolymer in E5723 will not pose a significant risk to public or occupational health when used in the prescribed manner.

### **13. RECOMMENDATIONS**

To minimise occupational exposure to Copolymer in E5723 the following guidelines and precautions should be observed; it should be noted that these recommendations take into account the form in which the notified polymer is imported (E5723, the notified polymer in diluent oil), and the fact that the polymer is never isolated:

- If engineering controls and work practices are insufficient to significantly reduce exposure to a safe level, then personal protective devices which conform to and are used in accordance with Australian Standards (AS) for chemical-type goggles with face shield (AS 1336; AS 1337) (15,16), impermeable gloves (AS 2161) (17) and protective clothing (AS 3765.1 AS 3765.2) (18, 19) should be worn.
- Good work practices should be implemented to avoid splashing or spillages.
- Good personal hygiene should be adopted.
- A copy of the MSDS for products containing the notified polymer in diluent oil, should be easily accessible to employees working with products containing the chemical.

### **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* (20).

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

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4. National Occupational Health and Safety Commission 1994, *List of Designated Hazardous Substances* [NOHSC:10005(1994)], Australian Government Publishing Service Publ., Canberra.
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12. Organisation for Economic Co-operation and Development, *OECD Guidelines for Testing of Chemicals*, OECD, Paris, France.
13. National Occupational Health and Safety Commission 1994, *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008(1994)], Australian Government Publishing Service, Canberra.
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17. Australian Standard 2161-1978, *Industrial Safety Gloves and Mittens (excluding Electrical and Medical Gloves)*, Standard Association of Australia Publ., Sydney, 1978.
18. Australian Standard 3765.1-1990, *Clothing for Protection against Hazardous Chemicals*, Standard Association of Australia Publ., Sydney 1990.
19. Australian Standard 3765.2-1990, *Clothing for Protection against Hazardous Chemicals Part 2 Limited Protection Against Specific Chemicals*, Standard Association of Australia Publ., Sydney 1990.
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## Attachment 1

The Draize Scale for evaluation of skin reactions is as follows:

<b>Erythema Formation</b>	<b>Rating</b>	<b>Oedema Formation</b>	<b>Rating</b>
No erythema	0	No oedema	0
Very slight erythema (barely perceptible)	1	Very slight oedema (barely perceptible)	1
Well-defined erythema	2	Slight oedema (edges of area well-defined by definite raising)	2
Moderate to severe erythema	3	Moderate oedema (raised approx. 1 mm)	3
Severe erythema (beet redness)	4	Severe oedema (raised more than 1 mm and extending beyond area of exposure)	4

The Draize scale for evaluation of eye reactions is as follows:

### **CORNEA**

<b>Opacity</b>	<b>Rating</b>	<b>Area of Cornea involved</b>	<b>Rating</b>
No opacity	0 none	25% or less (not zero)	1
Diffuse area, details of iris clearly visible	1 slight	25% to 50%	2
Easily visible translucent areas, details of iris slightly obscure	2 mild	50% to 75%	3
Opalescent areas, no details of iris visible, size of pupil barely discernible	3 moderate	Greater than 75%	4
Opaque, iris invisible	4 severe		

### **CONJUNCTIVAE**

<b>Redness</b>	<b>Rating</b>	<b>Chemosis</b>	<b>Rating</b>	<b>Discharge</b>	<b>Rating</b>
Vessels normal	0 none	No swelling	0 none	No discharge	0 none
Vessels definitely injected above normal	1 slight	Any swelling above normal	1 slight	Any amount different from normal	1 slight
More diffuse, deeper crimson red with individual vessels not easily discernible	2 mod.	Obvious swelling with partial eversion of lids	2 mild	Discharge with moistening of lids and adjacent hairs	2 mod.
Diffuse beefy red	3 severe	Swelling with lids half-closed	3 mod.	Discharge with moistening of lids and hairs and considerable area around eye	3 severe
		Swelling with lids half-closed to completely closed	4 severe		

### **IRIS**

<b>Values</b>	<b>Rating</b>
Normal	0 none
Folds above normal, congestion, swelling, circumcorneal injection, iris reacts to light	1 slight
No reaction to light, haemorrhage, gross destruction	2 severe